THE SIGNAL

Newsletter of the Bella Vista Radio Club

VOL. 2, NO. 7 – OCTOBER 2019

Monthly Meetings: 1st Thursdays @ 7 p.m., Highland Christian Church, 1500 Forest Hills Blvd, Bella Vista
Club Call: N5BVA • Repeater: 147.255 +offset, pl 162.2 • Website: www.bellavistaradioclub.org

WEEKLY NETS:

3820 kHz Roundtable - Sundays @ 4 pm
147.255 Repeater Net - Wednesdays @ 8 pm
Wide Area Net - Wednesdays @ 9 pm on the N5UFO NWA Linked Repeater System

THIS MONTH'S FEATURES:

- MEMBER SPOTLIGHT: GLENN KILPATRICK – WB5L
- LONG TIME JOURNEY OF A SOMETIMES CW OPERATOR- PT. 2
- REMINDER – 1ST ANNUAL BVRC CW ROUNDUP
- WHAT IS D-STAR?
- CORNFIELDS AND CONTESTING
- HAM 101 – GET TO KNOW YOUR HAM BANDS

B V R C OFFICERS:

President
Glenn Kilpatrick – WB5L

Vice – President
Chris Deibler – KG5SZQ

Secretary
Wayne Patton – K5UNX

Treasurer
Marc Whittlesey – WØKYZ

Technical Officer
Steve Werner – K5SAW

Repeater / Club Call Trustee
Fred Lemley – K5QBX

APPOINTED POSITIONS:

Public Information Officer
Membership Coordinator
Ron Evans – K5XK

Emergency Communications
Paul Blomgren – KC7DQY

HAM 101 Chairman
Gregg Doty – N5RGD

V E Testing
Don Cooper – KC7DC

2-Meter Net Coordinator
Chris Deibler – KG5SZQ

Social Media Coordinator
Sheila Katz – KØETA

Newsletter Editor
Don Banta – K5DB

NEXT BVRC MONTHLY MEETING

THURSDAY - OCTOBER 3, 2019 - 7 PM
HIGHLAND CHRISTIAN CHURCH
1500 FOREST HILLS BLVD.
BELLA VISTA, AR

OCTOBER PROGRAM:

AMATEUR RADIO & HIGH ALTITUDE BALLOONING

Amateur Radio High Altitude Ballooning is sometimes called "the poor man's space program." Our guest speaker, Sila – AKØSK, is a relatively new ham, but is quickly becoming an expert on this fascinating sub-interest within our hobby. Sila recently launched a mylar balloon with an APRS transmitter aboard. Potential obstacles are encountering the polar jet stream and violent winds, as the balloon races eastward at 55 MPH, at an altitude of 30,000 feet. As of 9/18, Sila's balloon has traversed the Atlantic and Mediterranean, and was over Russia (https://aprs.fi/info/a/AKØSK-11) . Sila lives near the Kansas City airport and joins us via Skype.

BVRC SEPTEMBER MEETING
PROPAGATION

Carl Luetzelschwab – K9LA, veteran radio amateur, propagation specialist, and current Vice-Director of the ARRL Central Division was BVRC's guest speaker for the September 5, 2019 meeting. Carl appeared via Skype (thanks to Steve – K5SAW and Fred – K5QBX for facilitating the videocast).

Carl is a Purdue University graduate and has studied radio propagation for many years. He provided the club with some excellent information on understanding some of the propagation data, as well as using the data to make operating more pleasurable and efficient.

Some of the main topics Carl covered were:

A & K numbers – There are many indicators that enable the HF radio propagation conditions to be predicted. However, it is indicators of the level of solar radiation and geomagnetic activity that give the best clues to the possible state of radio communication propagation conditions via the ionosphere. The main solar indices are the solar flux and the geomagnetic indices known as the A and K indices.

Using these, it is possible to manually deduce what conditions may be like. However, there several packages of radio propagation prediction software that are available. These take the various indices into account along with the position on the globe, time of day, season, and the position in the sunspot cycle. One of those tools, and a very easy one to read and assimilate, is at: https://dx.qsl.net/propagation/propagation.html:

Propagation

This page contains a dynamic collection of propagation information gathered from many different sources. This data is extremely useful for ham radio operators and shortwave listeners to help determine whether or not long distance radio communications are possible.

The current time is: 15:26 UTC on Sunday, September 08, 2019

Current Solar Indices from WWV
08-Sep-2019 at 1505 UTC SFI = 74 A = 7 K = 2
Conditions during the last 24 hours
No space weather storms were observed for the past 24 hours.
Forecast for the next 24 hours
No space weather storms are predicted for the next 24 hours.

Solar Wind Data
Provides solar wind velocity and energetic particle intensity
Updated at: 1519Z on September 8, 2019

Velocity (km/s):	445.9
Density (protons/cm^3):	2.5

(ACE satellite solar wind data has been intermittent)

Penticton Observatory SFI Measurement
WWV only updates its SFI reading once a day at 2100Z
The Penticton solar observatory takes measurements at 1700Z, 2000Z, and 2300Z
(WWV uses the 2000Z Penticton measurement)

The Penticton Observatory SFI value on 7-Sep-2019 at 2300Z was: 70

Carl said that, in general, we want low A & K numbers.

Some of the characteristics tied with A & K indices are:

Proton Flux – Also known as a solar proton event (SPE), or " proton storm ", this occurs when particles (mostly protons) emitted by the Sun become accelerated either close to the Sun during a flare or in interplanetary space by CME shocks. The events can include other nuclei such as helium ions and HZE ions. These particles cause multiple effects.

Electron Flux - This term indicates the intensity of the outer electron radiation belt at geostationary orbit. Measurements are made in two integral flux channels, one channel measuring all electrons with energies greater than 0.8 million electron Volts (MeV) and one channel measuring all electrons with energies greater than 2 MeV.

Aurora – This a natural phenomenon caused by the interaction of charged particles from the sun with atoms in the upper atmosphere. The amount of energy from an auroral event can definitely affect propagation, and especially on the lower frequencies.

Carl, also added that concerning the D-Layer of the ionosphere, the lower bands need more darkness for improved propagation, whereas the higher bands need MUF (Maximum Useable Frequency).

He concluded his program with a current update of sunspot Cycle 24. Carl stated that, according to propagation numbers, we are at, or just coming out of, the bottom of the cycle. He said that, according to many solar weather scientists and researchers, that this cycle will not be much improved, if at all, over Cycle-23.

From The Desk Of the President

When time rolls around for our monthly newsletter, I usually sit in the shack and ponder about what to write.

What is it about amateur radio that attracts us? There are as many answers to this question as there are members in BVRC. To some, it's sitting in the shack in the quiet, listening to a faraway DX station on HF. Others like to keep up with all their radio friends on the nets. Still, the excitement of ham radio is different for everyone. Obviously, we all share a deep interest in the Club. Some say that it's a geeky hobby and fading away in favor of Buzzfeed, Pinterest, Facebook, etc. However, we know the allure of the hobby will never fade away. The unique mix of fun, constant learning, public service, and worldwide convenience is the distinguishing characteristic of amateur radio. Synergy is the interaction of all its parts, which produces a combined effect greater than the sum of the separate pieces. Put it all together, and you have amplified excitement! That's it – hams have SYNERGY!

As the late summer weather seems to hold back fall, let's remember to get those antenna projects ready for the approaching winter radio season. We have lots of upcoming events on the calendar for the club. Ron, K5XK and crew are doing an outstanding job on the program presentations for the club. I very much look forward to meeting everyone at the events and informative meetings.

73 – Glenn, WB5L

BVRC VE REPORT

September 14, 2019

Congratulations!

Michael Jones – KC5MXV – New General!
Douglas Markham – New Technician!

Test sessions are conducted each 2nd Saturday of the month, 2 pm, at the Highland Christian Church in Bella Vista

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

New BVRC Members!!!

Luke Kesseler – KI5GCD – Bella Vista
James Skinner – KG6HSD – Pea Ridge

B V R C MEMBERS' CORNER

FROM MEMBERSHIP COORDINATOR RON EVANS – K5XK

KCØDX – Ed is having fun with a 1Ø watt MicroBTX CW/SSB HF transceiver. Ed acquired the compact, inexpensive radio at the Joplin hamfest.

K5XK – Ron has acquired a 'previously loved' Flex 6300 SDR, and with Mark/K5XH's help, is venturing into FT-8.

K5DB – Untimely Windows 10 updates scrambled Don's computer / Signalink interface settings, but with Don is pleased to be back on FT-8 digital mode.

K5XH – A 'digital aficionado', Mark placed in the 'Top 10' of this year's RTTY Roundup earlier this year.

W5JAY – Proving that persistence pays, Jay has secured a coveted QSL card confirming a contact 23 years ago with "PYØT," an obscure island off the coast of Brazil.

WB5L & K5SAW – Glenn, Steve, and other BVRC members in the western B.V. Highlands experienced lengthy power outages, downed trees & antennas during the recent storm. (Also see Steve/AB9YN's damaged vertical, elsewhere in this N/L.)

AB5DD – After the recent Bella Vista power outages, Dana installed a transfer switch that facilitates conversion from commercial to generator power.

KEØQFO – Alan is anxious for cooler WX to erect his tower to support an array of

W5XNA – There are big sigs radiating from north Fayetteville, thanks to Tom's new Carolina Windom and Ameritron AL-80B HF linear amplifier.

K5DB, K5XH, K5XK, KK5II, WB5L, K5VR & W5XNA – Attended ADXA's fall meeting Sept. 21, at former ARRL President W5ZN's impressive station in Central Arkansas.

ACØQU – Bill has managed a full wave 75-meter Loop antenna (264') on his central Bella Vista lot, and reports that it is working great.

KC7DQY, N5RGD – Paul, BVRC's EmComm Coordinator, & Gregg organized the Club's display and participation in the NWA Emergency Preparedness Fair in September.

K5DVT – A new freshman at the U of A, Jon wasted no time getting involved with ARCUA, and the University's radio club/station, W5YM.

KI5DUU – Kudos to Dallas, a Bentonville West h.s. junior, who has acquired a Kenwood TS-440S HF transceiver and antenna.

N5KWL – Tem has been staying extremely busy maintaining the N5UFO NWA Link System, as a result of late summer storms, and may be adding Echolink and D-Star capability.

Anticipating improved HF conditions, **Joe/W5AEN** has been busy acquiring new antennas to bolster his sigs. See the pic at: https://photos.app.goo.gl/TbkbimUFKTFanATc6

Porcupines Love Ham Mobiles.....

BVRC Member Spotlight

GLENN KILPATRICK WB5L

As our esteemed BVRC President's 2nd and final term winds-down, we are happy to feature WB5L – Glenn Kilpatrick as this month's Spotlight member. To enumerate all the things that Glenn has accomplished not only for the club but for the NWA region, would make a lonnnnnng list. Glenn will also be traveling to Searcy, AR on Sept. 21 to attend the 3rd quarter meeting of the Arkansas DX Association, and to be presented the ARRL Delta Division Ham of the Year award, another of Glenn's many accolades.

Glenn is the Senior Systems Administrator for Linux/Unix systems at Simmons Foods for two years now. Glenn's position involves him in the day-to-day operations of about 300 servers that consists of upgrades, security releases, and troubleshooting. Before that he worked at Wal-Mart as an advanced cyber security engineer and Unix administrator for about 10 years. Previous to that, he served at IBM and AT&T in Atlanta. He has been working on Unix systems since 1988. Glenn has resided in NW Arkansas for 20 years, and his QTH is on Gobbler's Knob west of Bella Vista.

He has been a ham since 1988, originally licensed as N4UJS. He passed his Novice and Technician class license exams at the Lawrenceville, GA ham-fest on his birthday. He then upgraded to General in 1991, and then took a class at Freed Hardeman College to prepare for the Extra class exam. He passed the test, then moved to Arkansas in 1999. He achieved the vanity call WB5L in March 2003.

When it comes to the topic of how he discovered amateur radio, Glenn says, "Back in my teenage years, I got interested in shortwave. I had a small transistor radio, and would listen to WGN, WSB, and others at night on AM. I built my first crystal set and had wires hung in trees at my parents' house in north Atlanta. As I went off to college and got interested in other things (including girls), my interest waned. Later, in the 1980's I got into CB radio, like many other hams. I would talk to all my friends in the neighborhood. As the family came along, I found myself cutting off the radio when the girls were in the truck, because of the profanity. Surely there was something better.

I then became acquainted with Phil Elrod – K4COF (now a SK), that **C**rafty **O**ld **F**ox. Phil then became my elmer. Mr. Elrod was a seasoned ham and Air Force MARS member. He lived three houses up the street, and I spent many hours in his shack and backyard shop. He taught me the "ropes". He took my Drake TX-4C / R-4C and showed me how to align it, and I learned a HUGE amount of radio related stuff from him. I joined the Air Force MARS program and eventually became NCS for Region 2 back then."

Commenting on his favorite facets of the hobby, Glenn said, "There are so many facets of Ham radio! I'd like to say I've done them all! I have not operated satellite radio, nor anything above 70cm. I am currently on a CW kick. I like the fact that it has eliminated a lot of garbage from my receiver. Not only garbage from inconsiderate operators, but the small bandwidth eliminates un-wanted noise as well. Plus, if you are chasing DX, you *need* CW. Its 500 Hz or less concentrated single tone will cut through the atmospherics where a 3 kHz SSB signal will just scatter into the noise. Narrow bandwidth modes are better than wide band. Just look at the popularity of modes like FT-8 and FT-4. As digital modes evolve, we are getting some amazing worldwide results with the new technology. CW, however, makes it clear that when all else fails, good old 1920's technology will still get through. I also like a good ole' rag-chew. More and more I am liking AM with the high-quality audio (although >6 KHz bandwidth). However, you need a good strong signal.

Concerning his shack equipment, Glenn says he is blessed to have resources these days –

On HF, his gear includes a Flex 6400 and a Kenwood TL-922A amplifier as the main setup. He also has a Kenwood TS-830S, Kenwood TS-450S, and a Drake TR-4C as backups. He also has a Hallicrafter SX-99 receiver and a home-built SW-40+.

For VHF and up, Glenn uses a Kenwood TS-790 as the main shack VHF/UHF transceiver. He also has a Yaesu FT-8100 mobile, Yaesu FT-2600M APRS, and Icom FT-60 handheld.

His antenna system consists of a Rohn-25 tower at 54 feet, with a Comet GP-9 60 feet at the base, a Hy-Gain TH3 Tri-band Yagi (10, 15 and 20 meters), an 80-meter and 40-meter inverted-V at 50 feet, along with a 20-meter horizontal loop, diamond shaped, apex at 50 ft, fed at the bottom with 75 Ohm matching section. (Great Antenna) Glenn also uses a mobile mag-mount vertical on the chimney for APRS and a "storm" antenna.

Glenn is married to his lovely XYL, Kathy. Glenn your leadership the past two years has been invaluable, and it will be long remembered. Thank you so very much for your service to BVRC!!!

From two Steves in our club.....

INTERESTING INFO FROM STEVE-W5KI

Steve has alerted us on this excellent article from the website of AB7E, on MDD – Minimum Discernable Difference. The recordings contained within the article are an impressive demonstration of the benefit of one dB of signal strength improvement in a weak signal situation.

Here's the link:
www.ab7e.com/weak_signal/mdd.html

(Thanks Steve!)

WHEN A VERTICAL IS NOT A VERTICAL

Our BVRC video program master, Steve-AB9YN, sent us this picture of his Hustler 5BTV vertical as an example to the damage and destruction that the Bella Vista area sustained during the severe wind thunderstorms in the area a few weeks ago. His dipoles were also damaged. Steve says he's thinking about a repair attempt on the antenna, or he may consider a Hex beam. Thanks for the pic, Steve.

WHAT IS UTC AND HOW DOES IT WORK?

Coordinated Universal Time (UTC or Zulu) could be nicknamed "world time". It is the time at the zero – or reference – meridian, located in Greenwich, England. Previously it was referred to as Greenwich Mean Time or GMT. Amateur radio operators and, in particular, those who are involved with DX-ing, use this time. UTC changes one hour with each change of 15 degrees in longitude. The time zones in the lower 48 United States proper and Canada roughly follow these lines.

UTC = Coordinated Universal Time (Zulu)
PST = Pacific Standard Time (UTC - 8 hours)
PDT = Pacific Daylight Time (UTC - 7 hours)
MST = Mountain Standard Time (UTC - 7 hours)
MDT = Mountain Daylight Time (UTC - 6 hours)
CST = Central Standard Time (UTC - 6 hours)
CDT = Central Daylight Time (UTC - 5 hours)
EST = Eastern Standard Time (UTC - 5 hours)
EDT = Eastern Daylight Time (UTC - 4 hours)

UTC (Zulu) TIME CONVERSION CHART

UTC (ZULU)	EDT	EST/CDT	CST/MDT	MST/PDT	PST
0000	1600	1700	1800	1900	2000
0100	1700	1800	1900	2000	2100
0200	1800	1900	2000	2100	2200
0300	1900	2000	2100	2200	2300
0400	2000	2100	2200	2300	0000*
0500	2100	2200	2300	0000*	0100
0600	2200	2300	0000*	0100	0200
0700	2300	0000*	0100	0200	0300
0800	0000*	0100	0200	0300	0400
0900	0100	0200	0300	0400	0500
1000	0200	0300	0400	0500	0600
1100	0300	0400	0500	0600	0700
1200	0400	0500	0600	0700	0800
1300	0500	0600	0700	0800	0900
1400	0600	0700	0800	0900	1000
1500	0700	0800	0900	1000	1100
1600	0800	0900	1000	1100	1200
1700	0900	1000	1100	1200	1300
1800	1000	1100	1200	1300	1400
1900	1100	1200	1300	1400	1500
2000	1200	1300	1400	1500	1600
2100	1300	1400	1500	1600	1700
2200	1400	1500	1600	1700	1800
2300	1500	1600	1700	1800	1900
2400	1600	1700	1800	1900	2000

SHE DROVE ME TO DX-ING.....

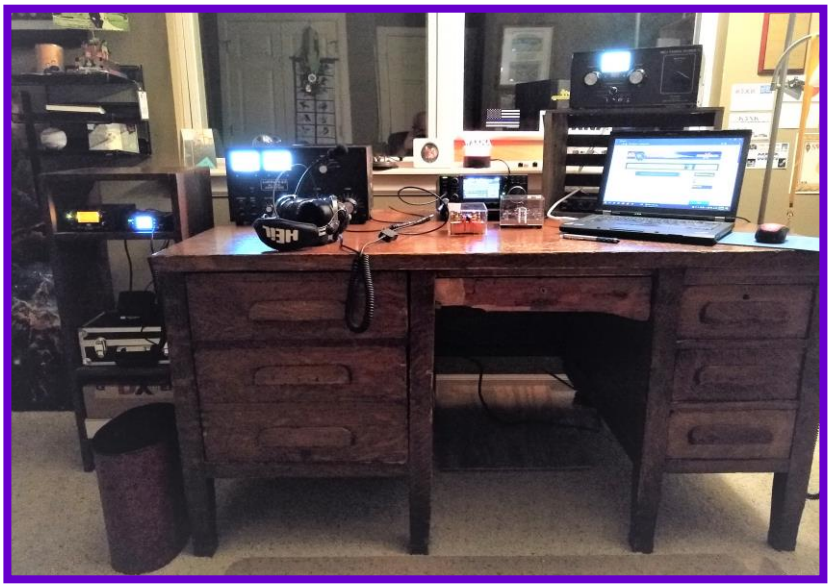
IT'S THE ONLY THING I'LL FOREVER BE INDEBTED TO HER FOR.

"THE SHACK"

When hams use the term "the shack", they are using a slang term for a room or some other structure for housing their radio equipment. For those who do not know where this term originated, here's some trivia information for you:

In the early days of radio, equipment was experimental, and home built. The first radio transmitters used a noisy spark to generate radio waves and were often housed in a garage or shed. When radio was first adopted by the U.S. Navy, a small, wooden structure placed on deck to house the ship's radio equipment became known as the "radio shack". (No we're not talking about the former chain Radio Shack Corporation.) The term stuck and was soon adopted by military and hobbyists alike to describe any form of radio room.

W5XNA Enhances Shack



Tom – W5XNA recently upgraded his already FB shack, to a first-class HF station. In addition to his ICOM 7300, Tom has now added an MFJ 989D Versa Tuner V antenna tuner, an Ameritron AL80-B amplifier, and a Radio Wavz Carolina Windom 80 antenna flat-topped at 50'. Congrats Tom!

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A police officer called the station on his radio.

OFFICER: "I have an interesting case here. An old lady just shot her husband for stepping on the floor she just mopped."

DISPATCHER: "Have you arrested the woman?"

OFFICER: "Not yet. The floor's still wet."

ANNOUNCING THE 1ST ANNUAL BVRC CW ROUNDUP

Reminder

Date: Saturday, Nov. 9, 2019
Time Period: 0000 – 0300 UTC (6pm – 9pm local time)
Frequency: 3.540 – 3.560 kHz
Operating classes: ***CLASS A*** – BVRC member – Experienced CW operator
CLASS B – Newcomer or newer CW operator (BVRC member or non-member)
CLASS C – Non-BVRC member – Experienced CW operator
CLASS D – Listeners who copy and log only, with the use of FL Digi, code readers, etc.

CQing: Send "CQ CWR CQ CWR"
Exchange: Signal report (including operating class) / QTH (your location) / name
Example: You are a newer CW operator and you are in QSO with K5XYZ. Their signal is readable, their signal strength is registering a '7' on your S-meter, and their signal tone is good. ------- Your callsign is W5ABC, you live in Bentonville, and your name is Albert. You would send something along the lines of:

K5XYZ DE W5ABC $\overline{BT}$ (break)

RST IS 579 B 579 B $\overline{BT}$

QTH IS BENTONVILLE, AR BENTONVILLE, AR $\overline{BT}$

NAME IS ALBERT ALBERT $\overline{BT}$

HW CPY? (How did you copy my transmission?)

K5XYZ DE W5ABC K (Over)

The other station would then reply with their information using the same format. After the exchanges are completed, short informal remarks can be made during the QSO, after which the contact would end with something along the lines of:

TNX FER QSO (thanks for the QSO)

GL ES 73 (Good luck and best wishes)

K5XYZ DE W5ABC $\overline{SK}$ (end of contact)

Description of event: This 3-hour event is not a contest. Rather, it is a celebration of our area CW newcomers, returners to the mode of CW, and listeners. It is also intended to enable our veteran CW operators to enjoy helping the newcomers in making CW contacts. There are no points scored, and no results or standings posted. You do NOT have to be member of BVRC to participate.

A handsome certificate will be available to each participant submitting a log entry from the event.

Send logs no later than Saturday, Nov. 23, to Don Banta – K5DB:

Regular mail log: Don Banta
3407 Diana St.
Springdale, AR 72764

Electronic log: arsk5db@gmail.com
Attach file: [call].log

LONG TIME JOURNEY OF A SOMETIMES CW OPERATOR-PT. 2

By John Bryant – N5SU

Last month, I introduced you to a brief description on iambic CW keying, with a picture of my new UR5CDX CT-755 paddle. The paddle arrived safely intact. And no wonder, the packaging was superb...double-boxed and actually bolted down to a heavy cardboard shell inside the product box. Took a total of around 15 minutes just to free it for use, hi hi.

As you can see from the pictures, the polished chrome appearance is superb. Aside from switching the dit and dah lines to match my existing Bencher, it was up and running (In reality, I faintly remember terminating the Bencher with a 1/4" phone plug myself and could easily have violated the standard, if there even is one).

The CT 755 also comes in beautiful polished brass (-B suffix instead of -X) but I chose chrome due to the required maintenance of having to regularly polish the tarnishing brass. Most others who reviewed it did the same.

It took a bit of tinkering to get her adjusted just the way I like it, but so far, it's living up to my expectations. Unfortunately, like others, its design is a modification of UR5CDX's dual paddle iambic key. Actually, so is the coveted K8RA single lever. But his mod is more symmetrical, simply inserting a third center lever to manipulate the two existing levers on each side. Yury's approach was to terminate the rightmost lever at the pivot point and let the left paddle lever maneuver the dash lever when pressure is applied to the right side of the paddle. At first, I feared this was causing a bit of sluggishness on the 'dash' side. But in exploring the various adjustment points, I discovered the top pivot screw of the rightmost lever

was a bit tight. Just the slightest loosening freed up the movement for near perfect operation.

Would I trade her for a K8RA if available? Possibly, but not without spending at least as much time with it as I have with the 755. Yes, I was immediately very impressed with my ham friend's K8RA, but I really only sent 'CQ CQ de N5SU N5SU' which you can now hear live on the ham bands coming from my new CT 755. Please don't hesitate to answer...and don't forget to QRS, hi hi.

By the way, for those of you who read the first part of this article last month and, like me, were still wondering why they're called Iambic Paddles...check out this interesting dissertation by Marshall G. Emm, N1FN :

http://www.morsex.com/pubs/iambicmyth.pdf

BVRC CLUB ACCESSORIES!

Show you're a proud BVRC member with:

- Key Tags
- Badges
- Desk Name Plates
- Mouse pads
- Ceramic Mugs
- White & US Flag License Plates

To order your personalized club product, click here !

What Is D-Star?

D-STAR, which stands for 'Digital Smart Technology for Amateur Radio' is an open digital amateur radio standard that offers users a number of ways to connect with other users globally via a worldwide network of digital amateur radio repeaters.

Just like other forms of amateur radio, D-STAR has a broad appeal from those amateurs wanting to communicate just for fun to those who would prefer to push their technical expertise.

The D-STAR protocol has rich, exciting opportunities for amateur radio enthusiasts to experiment and build, utilizing 21st century tools such as the web, networking, ethernet, TCP/IP and radio. D-Star is innovative and is keeping radio amateurs at the forefront of communication technology - amateur radio has a great future and is moving forward right now with D-STAR digital technology.

Provides digital voice communication

D-STAR gives users the ability to connect via digital voice as well as slow and high-speed data communications. Slow speed digital voice and data are transported at 4800 bps, of which 3600 bps is used for voice transmission, the remaining 1200 bps used for synchronization and general use. Of that 1200 bps, around 900 bps is available for the transmission of data.

Internet facilitated Global Connectivity

You can dial up your friend directly simply by putting in his/her callsign into your radio without knowing his or her current location or what D-STAR repeater they are currently using. Repeaters can also be linked together as needed by operators on air to form a wider area conference or system administrators can link repeater gateways together to link all voice & data from multiple repeaters together. Operators can also talk to a repeater via one band and be cross banded out another band on the same repeater. Repeater systems can be interconnected via "reflectors" which are essentially servers on the Internet with appropriate capacity behind broadband Internet links that interconnect many repeaters together.

Open System

D-STAR is capable of connecting repeater sites using the web to form a world-wide radio network. Voice is converted to a digital format using a bit of computer code referred to as a CODEC. The CODEC code is embedded on a microchip which encodes and decodes the audio signals into and out of the Advanced Multi-Band Excitation format). The CODEC that D-STAR uses is the only proprietary portion of DSTAR. All other parts of D-STAR are open which has allowed enthusiasts to develop this part of the hobby.

Good Quality Audio

The quality of the D-STAR voice signal is very similar to that of FM voice. There is no degradation in the signal quality that is found with traditional analogue voice modes and no squelch tail at the end of every transmission.

Spectrum Efficient

If you've tried to use a repeater channel on 2-meters or 430- 440 MHz in any city, you know how crowded the bands can be. The D-STAR voice and low-speed data signal offers a significant improvement in spectrum efficiency, requiring only a 6 kHz channel instead of the 20, 25, or even 30 kHz of analogue wide-band FM. D-STAR repeaters can be interleaved between existing channels or multiple repeaters deployed in the spectrum of only one analogue FM repeater.

HOW TO GET INVOLVED WITH D-STAR

D-STAR (Radio only)

You can use your handheld radio to connect with a local D-STAR enabled repeater and then use it to link to talk to people elsewhere in the world.

NOTE: Our area has 3 D-Star repeaters and their locations make it possible for just about anyone to access them, no matter what your QTH is: Rogers (Dodd Mountain) KG5JPJ 442.525, Eureka Springs KG5JPK 443.425, and Winslow KG5JPI 442.612.

DVAP (Where there are no local repeaters)

With a DVAP (Digital Voice Access Point), you can plug a little dongle into your computer. Then you can use you own D-STAR handheld or base radio to transmit to the computer, which takes your voice and transfers it over the Internet to other repeaters, reflectors, and users. This is essentially the same thing as the previous option, but this works if there is no local repeater in your area.

Hotspots

Hotspots are very similar to the DVAP although DVAP's low power limits locally e.g. around the house, or maybe down the street if connected to an outside antenna.

A Hotspot on the other hand is usually connected to a higher power standard analogue VHF or UHF radio (with a 9600 baud packet port) and therefore has a lot more flexibility and range. With a sufficiently high antenna connected to a radio with a Hotspot interface, you can actually create what some might call a simplex repeater. Like the DVAP, the Hotspot is connected to an Internet enabled PC and the radio via the 9600 baud packet port. The radio is set to a D-STAR simplex frequency and you and your friends can talk all around the world from another hand-held or mobile radio.

DV Dongle

Another very popular use of D-STAR is to just plug a dongle and a microphone into your PC and talk to other Amateur radio enthusiasts around the world through the internet.

Getting set up with D-STAR

The absolute first step is to get yourself registered on the D-STAR network. D-STAR Gateways enable users to connect from a local D-STAR repeater, equipped with a D-STAR Gateway, to any other Gateway equipped D-STAR repeater.

Once an Amateur is registered with a repeater gateway, it can connect to D-STAR users beyond the local repeaters. You do not have to be registered with a gateway to use a local repeater, only if you want to make use of the D-STAR network. You only have to register with one gateway as your registration information is propagated to all other gateways and reflectors in the D-STAR network.

The second step is to make sure you actually have a local repeater that supports D-STAR. If you're in a city, you probably do, but there are still some gaps in the UK without D-STAR coverage.

How does D-STAR work?

There are a number of ways you can communicate on the D-STAR network. These include using D-STAR enabled radios that are capable of 3 digital communication streams.

1. Digital voice
2. Control data
3. Data messaging

The occupied bandwidth of the digital signal is smaller than that needed in analogue transmissions and therefore more digital channels can be provided in a given bandwidth. To enable the repeaters to communicate with each other over the internet the repeater is connected to a PC running a LINUX operating system and Gateway software. This software connects to other gateways and keeps the user lists up to date and connects the digital streams between repeaters. All of the information is distributed within a network that is managed by a 'Trust Server'. We are currently in the same net as America, Australia and Canada.

D-STAR repeaters can be operated in the same way as existing analogue repeaters except that they communicate using a digital transmission from the transmitting radio through to the receiving radio. Unlike other systems that have been developed that use the web for linking distant stations together, D-STAR treats all repeaters in exactly the same way. A local repeater is no different to a repeater 3000 miles away, you just have to route your call to the distant repeater. You can connect to a local repeater and a repeater across the internet and all participants will be treated as though they are on the same repeater.

COMPONENTS OF THE D-STAR NETWORK

D-STAR repeater system

***A D-STAR repeater system is typically composed of a repeater controller, 1.2GHz, 70cm, or 2m digital voice repeater, digital data repeater and the Internet gateway PC.

***The D-STAR repeater operates like an existing analogue repeater. That is a simple relay of transmit and receive communication within or across the 2m, 70cm or 23cm bands.

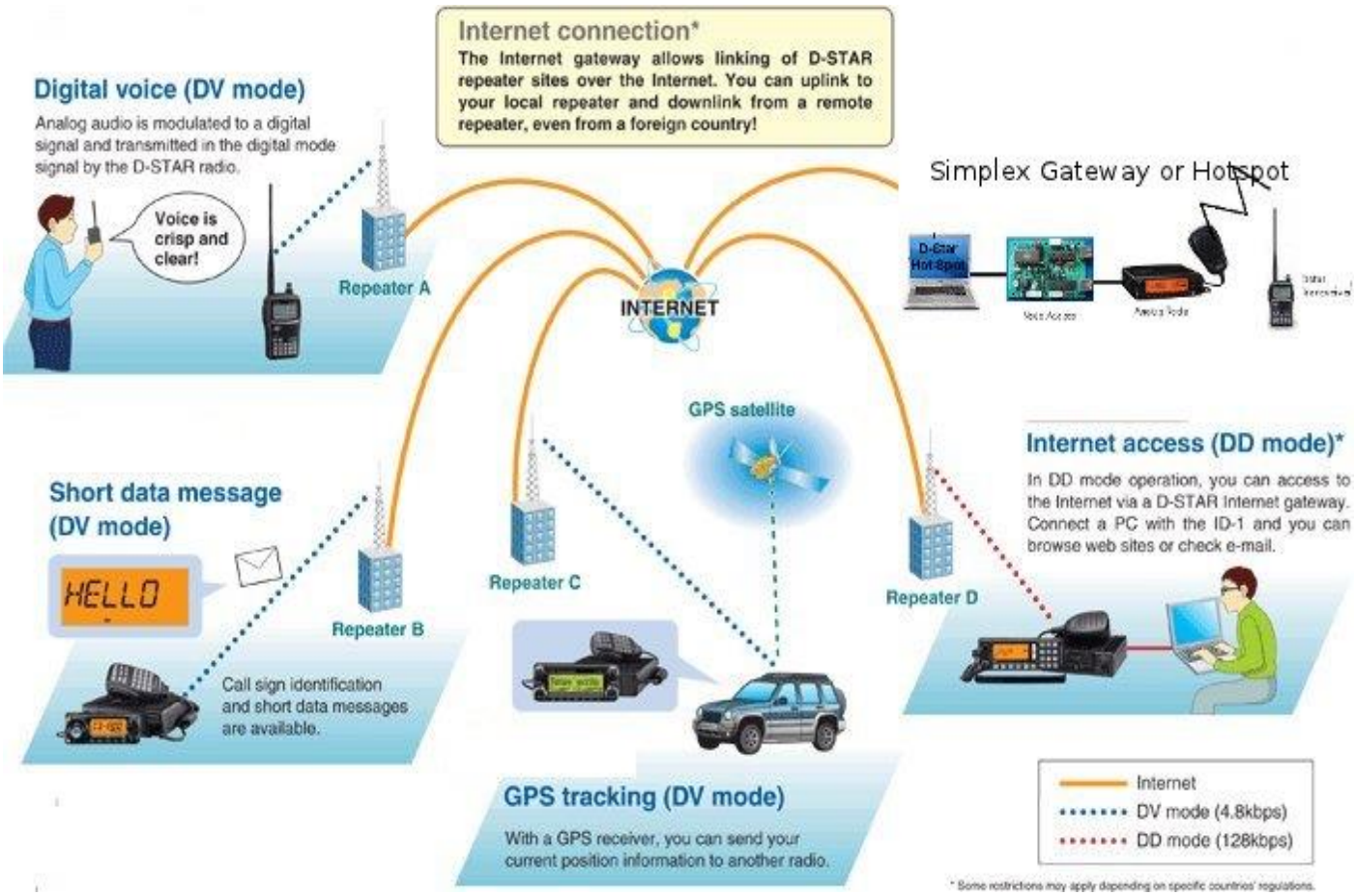
***When D-STAR repeaters are connected with the Internet gateway, the D-STAR system relays the received data over the Internet. Your message will get through virtually to anywhere in the D-STAR system.

D-STAR registry

As authorized users make their initial transmission to a D-STAR system, the call sign information attached to the digitized voice packets is recorded by the repeater controller. The controller then shares the information with other D-STAR systems through the D-STAR gateway registry. The registry is maintained on gateway servers located around the world. When an authorized D-STAR user makes a call to a call sign not currently registered on that repeater system, the registry allows the repeater controller to route the call to the repeater on which the targeted user was last registered.

D-STAR reflector

A reflector can be considered to be similar to a repeater, but with no RF capabilities. Reflectors are Internet connected servers, generally in data centers, which receive a transmission from a connected gateway (via the Internet) and send it out to all other connected gateways for retransmission, via RF in the case of a repeater. Reflectors are basically a conference bridge for D-STAR. They allow multiple D-STAR repeaters and Dongle users, from around the world, to be joined together and whatever information is transmitted across one of the repeaters is repeated across all of the connected repeaters.



Conclusion

D-STAR provides a whole host of opportunities for the amateur radio enthusiast to challenge themselves with tools from the 21st. Century. As with all forms of radio, you can dip your toe in the water for just plain old communication or delve further if you are interested in setting up repeaters and send data as projects. It might not be everyone's cup of tea, but this area of the hobby is growing with more and more repeaters and users being added all of the time... good luck in your digital journey!

There are many websites to find further information, ideas and support on this fascinating new part of amateur radio.

Editor's Note: About 6 months ago, I acquired a D-Star enabled handi-talkie – an Icom ID-51Aplus2. Trying to understand the user manual for the radio in programming it, was like trying to decipher goulash. I contacted the best ham I know on this subject, Tem – N5KWL, who invited me over to his QTH and in about 2 hours, he showed me how to program the unit and my understanding of D-Star was greatly enhanced.

Tem has advised us to pass along to all SIGNAL readers, that if anyone – or any group – becomes interested in D-Star to the point of needing guidance or an elmer in this area, he will be *happy* to help anyone in programming their radio and/or conducting a beginner's class in D-Star. **For more information, contact Tem at:** temmoore@gmail.com .

It was a most profitable 2 hours that I spent with Tem, and he was stellar in helping me get started. It's a great and fun system.

K5DB

DENNIS WAREHAM KØDKL

BVRC member Dennis also operates from his 'other' QTH in Minnesota. In the photo, Dennis is participating in this year's Arkansas QSO Party.

Dennis shared with us, "As you can see, my "shack" is pretty minimalistic. No monitors, test instruments, or amps. No rotator controls (hard to rotate my long wire). No antenna tuner (actually, there is one...but it's a remote auto-tuner outside). No second, third or fourth rig. Computer is a tiny (7-inch) ten-year-old freebie laptop, etc., etc. But it gets me on the air on SSB, CW, PSK31 and FT8. I think I will also see if I can try 10-meter FM repeaters.

CORNFIELDS AND CONTESTING: THE 2019 KANSAS QSO PARTY

by Don – K5DB

During the weekend of Aug. 24-25, I made my yearly trek to the Sunflower State of Kansas to participate in the annual Kansas QSO Party. I run in the QSO parties for the 4-state region each year in Arkansas, Kansas, Missouri, and Oklahoma, but have never shared about any of my experiences/adventures during these events, so I thought I would place this offering in this month's issue of THE SIGNAL.

After work on Friday evening Aug. 23, I traveled about 2 ½ hours to my start point in McCune, KS to Pete's Quick Stop convenience store and fuel stop. This was my start point last year. There are no motels anywhere near McCune, but the store has a nice "alley" on the north side that extends about 300' into a cornfield and appears to be used by farm equipment as there are 3 grain silos beside the driveway. As with last year, I backed my trusty little S-10 pickup into the driveway and had my good ol' cot to open-up and place in the pickup bed. That Friday night, I dozed off to sleep observing a great night sky with no moon to drown-out the view, and I was entertained by some of the constellations including Ursa Major (big dipper), Ursa Minor (little dipper), Boötes, Monoceros, Hercules, and Perseus. Some stray meteors danced through the sky for me as well.

Upon arising Saturday morning, it began raining pretty hard around 6 am, but quit at 8 about an hour before the KQP began (hallelujah!). I went about ¼ mile down the road from Pete's to a highway winter treatment shed (the BIG quonset hut with sand stored there for wintry weather road maintenance), and prepared to start. I was parked directly on the north side of US-400 which runs right on top of the Cherokee/Crawford county, Kansas line.

With my 3 deep-cycle batteries fully charged and ready to go, the FT-450d was fired-up, along with my laptop and Winkeyer. 1400Z (9 am local time) arrived and we were off and running. I was using the 1x1 callsign **NØT**.

After about 30 minutes, it was time for the first transit from my Stop-1 to Stop-2, the county line of Labette and Neosho counties. These counties are to the immediate east of Montgomery and Wilson counties, but the four do not intersect in exactly one point, they are

staggered about a quarter of a mile. But noooooo problem – all I had to do was drive down the county road I was on for that quarter mile, and park on the side of the Morehead Cemetery, and I was now on the Montgomery/Wilson county line.

Morehead Cemetery, Morehead KS
Montgomery / Wilson county line

Back to US-169 north, and I was headed for one of my favorite stops that I have used for the 3 years I have run the KQP, where FOUR counties intersect at the same point. It was about a 75-minute drive, then about 3 miles south on dirt road, but we made it there right on schedule, where we then gave-out four counties at once: Allen, Anderson, Coffey, and Woodson. This is a GREAT spot – directly adjacent to a huge soybean field with a cornfield bordering that.

Point Zero
Allen / Anderson / Coffey / Woodson county line

I have visited this location each of the 3 years that I have run in the KQP. This quad-county line is quiet, no power lines or transformers anywhere around, and you get serenaded by meadowlarks and red-wing blackbirds at no extra charge. The pileup calling me was huge because they knew that they were getting 4 contacts and 4 counties with just one QSO – a "four-fer". It was here during this year's KQP, that I experienced another "first" in mobile contesting – I worked R1DX in Russia. I have worked Europe on CW many times from the mobile, but never European Russia up to now. That was pretty exciting.

Next on the schedule was another 1-hour transit to the Osage/Shawnee county line, then to the tri-county line of Atchison/Jackson/Jefferson, then on to the final stop for Day-1, the Leavenworth/Wyandotte county line. Dusk was setting-in when I rolled into the motel parking lot at Bonner Springs, KS to get some rest and recharge both myself and the deep-cycle batteries Saturday night.

It had been a great day, especially with Mother Nature blessing us with upper 70s/lower 80s temperature……extremely rare for August in Kansas! The previous 2 years was the normal mid- to upper 90s. I was able to drive and operate all day with outside air and didn't use the a/c once!

After a good night's rest at the motel, my first stop on Day-2, Sunday, was about an hour away. I left the motel at 7:15 am and glad I did. I encountered a deluge for almost the entire distance from the motel being able to travel only about 30 mph through the torrents. About 15 miles from the stop it abated somewhat, and after about 2 miles down another dirt road, I arrived at another 4-county line: Douglas, Franklin, Johnson, and Miami. Again, I was out in the middle of a cornfield, but a great operating location – quiet, no traffic.

Point Zero
Douglas / Franklin / Johnson / Miami county line

The rain did not stop this time but had slacked about 80%. 9 am (1400Z) struck again, and again another HUGE pileup. I had intended on operating from this quad-county line for an hour, but the calls just kept coming, holding me there for another 30 minutes. This was no problem, as I knew I had about an extra couple of hours to get-in my final 8 counties by KQP stop time at 3 pm that afternoon. (Bruce – K9OZ from Little Rock worked me from this spot, giving me Arkansas for a multiplier! AR is hard to work in qso parties!)

I operated from this location last year as well, but this year brought many more QSOs for me, which I was elated about.

As I said there was no traffic, except……a man in an SUV came from my left (south) and turned left (west) where the roads and the four county lines intersect and started heading west toward the main highway. He traveled about a thousand feet and (ha, ha) turned around and came back toward me – insatiable curiosity! He got out and came up to the side of the pickup, "You ok?" I told him I was and gave him a 60 second description of what I was doing. "Oh….ok then, well I've lived out here for over 20 years, and I haven't ever seen anybody out here parked in the middle of the road." Having satisfied his inquisitiveness, he went on his way. The problem was, he cost me several QSOs, because I had to explain all what I was doing to him, right in the middle of the pileup! LOL! This has happened to me many times over the years – I've had motorcycles, pickups, state police, and county sheriffs stop to check me out. Of course, when I explain to them what I'm doing and show them my license plate, they always reply with the old adage, "Have a nice day."

Backtracking to the main highway, onward we went to the Bourbon/Linn county line. The pileups were getting bigger, probably because the KQP was nearing the end and many folks were trying to contact as many Kansas stations as they could.

I then trekked to Cherokee, KS, which was about 10 miles east of my starting point at McCune the day before, and ended my operation once again on the Cherokee/Crawford county line. The pileup today at this stop was twice what it was at my start yesterday. They called me right up until 1 minute before the end of the event, and it was time to head back to God's country of Arkansas and home.


Kansas State Highway 3
Bourbon / Linn County Line

I was born and raised in Arkansas, so you can understand when I say that no matter what state QSO party I run in, it's always GREAT to see that "Welcome To Arkansas" sign!

This was my best endeavor in the Kansas QSO Party, and overall the best result I've ever had in running contest mobile……

I worked 1207 QSOs including Russia, Hungary, Slovak Republic, and several Germany stations. I also worked 46 states (including Alaska for the first time!) and 7 Canadian provinces. Mobile contesting is super fun – you ought to try it sometime. But beware – once you get that adrenaline rush of the excitement that goes with it, you'll be hooked……

HAM 101

THE SIGNAL Monthly Column for New Hams

Get To Know *Your* Ham Bands

Let me take a moment to bring to light one of amateur radio's dirty little secrets – actually a sad condition of our hobby that just gets looked over or brushed under the carpet. Are YOU, a "ham" that is just like the poor sap that buys a ticket to enter a major theme park only to spend the entire day sitting in the food court next to the lockers, haplessly missing all the fantastic rides and captivating shows? Are you the kind of awkward person to dress-up for that long-awaited single's dance only to stand next to the punch bowl the entire evening? I am speaking metaphorically about your on-air activity – You say "No"…….Are you sure?

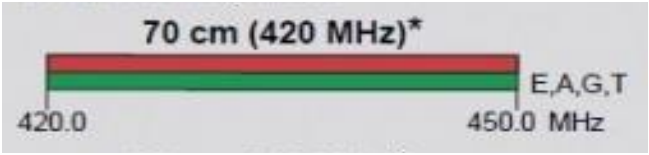
My counsel here is not directed to the avid contester or the obviously active mobile ham driving around in the equivalent to a metal porcupine, but to the "wall flowers" of our proud hobby! I think, upon closer examination, YOU hams know who you are. You were so excited 'back when' you passed your Technician's license and got your very own call sign, but what? You find yourself owning just an HT and maybe you check in on that Sunday night net once-in-a-while. There may still be hope! Maybe all you need is a good and willing "Elmer."

The world of amateur radio is an exciting one just waiting to be explored and enjoyed! Its electromagnetic vistas are ever so vast and fruitful, with new people to befriend from all walks of life. There are modes and ways to communicate that you may have never imagined. YOU may already have the right license class privileges to go on boldly exploring stranger lands by even stranger means – or most likely, as a 'Tech', you're only one examination away from passing, and being able to sample the buffet of the ionosphere. Is there actually more to this hobby than a "ker-chunk" and a weekly check-in on a local repeater? You bet your $40 Chinese HT there is!

Let me take you on a journey: one of shortwaves, dits and dahs, and "E-skip." Listed here is a brief description of most of our federally-granted frequency bands – bands that each have their own character, needs for different technology and rules. Bands that have been allocated to us by the FCC for our own enjoyment, education pursuit, and final commitment to use in service for our society's safety. People through time have fought hard, even at great cost, to ensure that YOU, the amateur radio operator, have the right to "play radio," because if you don't use it, perhaps there is some money-hungry corporation that can and will.

I don't expect anyone reading this to garner a full knowledge of our band plans and operating modes by my writ

alone. If you find anything of interest here, ask for an “Elmer” in your club. Events like Field Day and Special Event Stations are designed for the express purpose to put YOU behind the wheel – maybe to experience your first HF contact to a foreign ham in another land altogether. *They are your ham bands and modes to enjoy:*

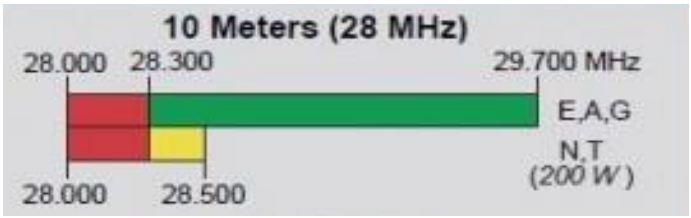


70 centimeters, commonly referred to as "440," is a UHF (Ultra High Frequency) band that has great value for emergency communications work. Many repeater systems are located here and often all you'll need to get on is a basic HT (hand talkie.) The use of 440 does not come without strings attached since hams are designated as "secondary" users on this band with power and/or use restrictions in some parts of the US, particularly near military bases. The small cost is worth it as 440 has added advantages that make it attractive for ARES emergency communications use. For one, UHF signals better penetrate thick walls like the concrete and metal ones found in office buildings and hospital facilities. The 440 band is also less susceptible to atmospheric anomalies like solar flares and Sporadic-E, however, and with the help of interoperability networks (D-Star, DMR, etc.) a ham's HT has world-wide voice and data connectivity at just the push of a button. All hams should strongly consider access to 70 centimeters when shopping around for HT’s and mobile transceivers.

2 meters is really the ‘go to’ band for most hams and the vast majority of new hams start here first because all you need is an HT which will get you into many local repeaters. On this VHF (Very High Frequency) band, repeater activity (in FM mode) makes up the majority of activity, though you can use other modes in their respective designated areas of this band including CW, digital and voice SSB. This band is known as the 'work horse' because most radio clubs host and monitor a flagship 2-meter repeater system that will get you connected to other hams in your area and even into adjacent counties. Unfortunately, either from a lack of interest or from inadequate mentoring many unfortunate hams may never feel the need to venture outside of this band – fecklessly ne’er to leave the cradle. The “main” 2-meter repeater and their HT is likely all they'll ever use. For those personally risking this sad fate, might I suggest reading on!

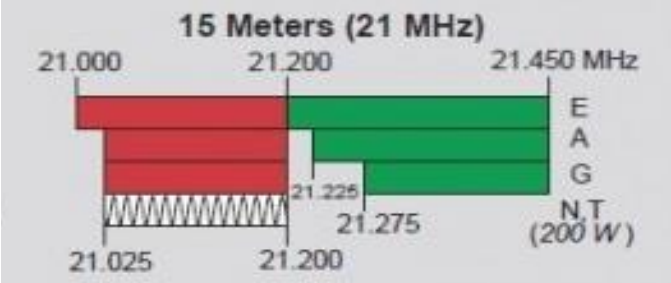
As far as signal propagation, 2-meter operation often shares the same Sporadic-E "magic" as 6 meters where stretches of 50 to 200 miles are possible. 2 meters penetrates walls well enough for most indoor work and is often the band of choice for emergency communications workers as on-the-job volunteer will only supply 2-meter HT capability if a great need arises in the aftermath of a communications disaster.

6 meters is like a perceivably dormant volcano: dead-quiet most of the time, but a sleeping giant that sometimes wakes without much warning to feed - a great VHF band, where if conditions are right, you can do about anything that can be done on HF and sometimes better. 6 meters is called the "magic band" because of its mysterious and spurious nature - its ability on short notice to send signals halfway around the Earth. Solar activity has some to do with 6-meter openings, but this effect can mainly be ascribed to cases of "Sporadic-E." Sporadic-E is a special ionization of the Earth's atmosphere's E-layer allowing signals to propagate. Look for these openings around the solstices (June through July and around December.) Other forces of nature can have an effect on VHF openings such as auroral events, meteor-scatter, moon-bounce, thermal ducting, trans-equatorial and grey line propagation. Hams working on VHF frequency will be found using directional beam antennas such as Yagi's and log-periodic antennas, often radiating up to legal-limit power levels to bridge the distant gaps through the ether.



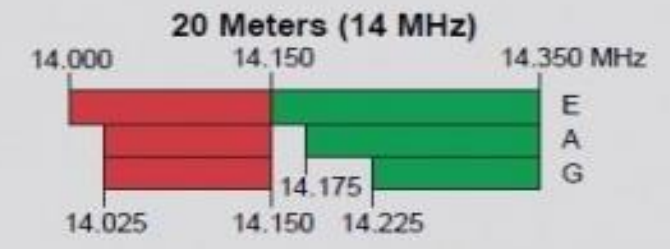
At 1.7 MHz wide, 10 meters is the largest of the HF (High Frequency) bands - and also a vast and barren waste land when the sunspot cycle is at its minimum. Propagation is extremely erratic and ground wave range is only around 25 miles. A ham may wait years to use 10, but when the sun is active, this band is the place to be - especially if you're a member of "10-10 International"! When propagation is good, expect world-wide DX communications of thousands of miles *with only just a few watts!* Openings to any part of the world are unpredictable, so hunting DX entities and QSL cards only adds to the excitement. By the way, 10 meters is the only HF band with a segment that allows hams with Tech licenses voice SSB operating privileges!

A very small band, but when sunspots are active this band is capable of very great DX distance with little power and meager equipment, making this a great band for mobile operation. When the sunspot cycle is at its low expect only local communications.



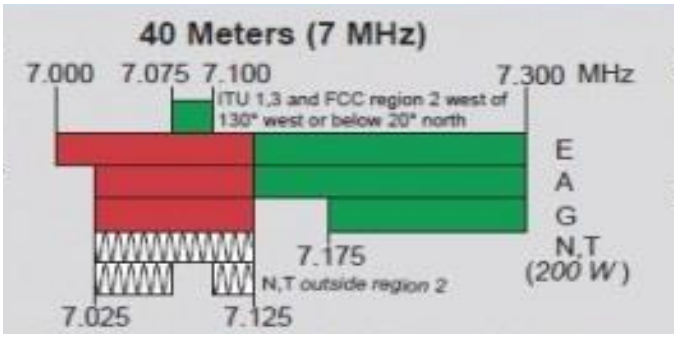
Like 17, 15 meters is similar to 20 meters but is more influenced by sunspot activity. There's little to no night time activity and at the low-end of the sunspot cycle, the band is almost dead, but at the peak of the cycle, 15 meters can get you some great DX distances. Novice and Technician license holders also have CW privileges on this band.

Band conditions are about the same as 20 meters. 17 meters has an appeal to mobile hams as it offers most of the same benefits as 20 but requires a smaller antenna and is a little quieter. This band is small like 30 but is segmented between CW and SSB operators and allows up to 1500 watts!

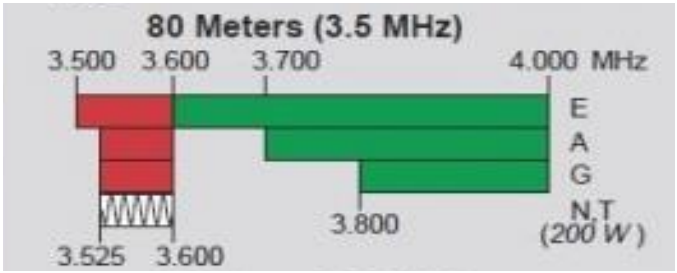


20 is where the serious DX'ers hang out! Daytime conditions here are as good as 40 meters at night. Worldwide communications are common all hours of the day when sunspots are up, but when they're not, the band can close up shop in a hurry. Locally, line-of-sight to 50 miles is often possible but regional communications are generally unlikely and selective one-way propagation is often the case nationally, especially as night time approaches. This band has all the advantages of 40 with the more quiet nature of higher frequency bands making 20 meters a prime spot for digital modes such as PSK-31, SSTV and RTTY.

30 meters is a small band like 40 meters, but only CW and digital are allowed. You'll find no broadcast interference here and only a casual number of operators make 30 their abode…that is, until a contest starts up. Then, parking is at a premium! The band, like 20, has somewhat longer range than 40 meters and daytime distances of 1000 miles are common. Hams are, however, limited to only 200 watts PEP (peak envelope power) here and when conditions are bad, you might not hear anything.

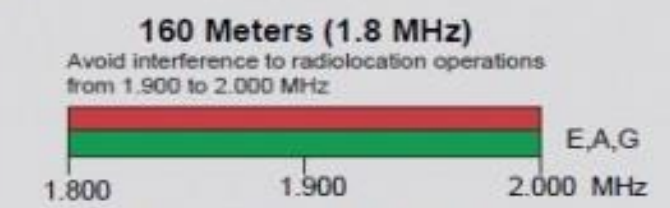


Every ham either loves or hates 40 meters. Like a popular restaurant, it's always open somewhere but it's often crowded! A 65' dipole antenna will get you regional coverage in the summer daytime with likely distances of 300+ miles, with 500 or more in the winter. 1000+ miles are very common during summer nights with DX (intercontinental) communications more common in the winter. This band, especially 7.2 MHz and above, is also the roost for many gigantic million-watt shortwave broadcasters from countries outside of North America. Between these strongly interfering signals, a ham with a modest station can still often work some great DX, provided you find a spot. 40 meters is not very affected by sunspot activity and it's another great place to hold regional nets. Here, you'll also find a lot of CW and digital activity at the bottom of the band and literally ever spot filled with voice SSB at the top.



Conditions on 80 meters are close to what they are on 40 and tend to be pretty reliable day and night. It also isn't very susceptible to the effect of sunspots, and for those reasons is regarded as a "go to" place for HF-based nets and regular group activities.

Emergency Communicators can place their 119' dipoles closer to the ground to get NVIS (Near Vertical Incidence Sky wave) communications on a more local and statewide level, but at night, the band can "go long" as propagation reaches out. Summer can bring a lot of atmospheric noise, but the quieter winter propagation can send your signals around the globe! Known as "The Watering Hole," expect to find a lot of established "locals groups 'rag chewing' in 'round tables'" using linear amplifiers – you'll find them warming up the ionosphere 'til the wee hours of the morning on frequencies that have been established for decades. Some you will find to be quite friendly, but others, not so much. Just use common courtesy and look around for a free spot to operate. As with several bands, the CW/Digital portion of the band is separate from the wideband modes of SSB (and even AM,) and access privileges are important to note, so if you wish to do some DX on 80, you might want to try for your Extra Class license.



Known as the "Top Band," because its wavelength is the largest, sits just above the AM broadcast band and is really a MF (Medium Frequency) designation rather than HF. In fact, if your older analog AM radio has band edges that extend outside enough, you can often hear CW hams doing their thing. If you're thinking of 160, a dipole antenna for this band would be 250' long, so you'll often find hams using loop antennas, or modified vertical antennas with an added loading element at the top called a "top hat." Band conditions and propagation on 160 are pretty similar to what you will find on the AM broadcast band, and not quite as much range as the 80-meter band. During the day, propagation is pretty much local, but at night you can expect greater distance. Summer nights bring good regional distances of a few hundred miles with a high amount of QRN (static) from nearby evening thunderstorms. However, in the winter you can expect a hop or two off the ionosphere at a few thousand miles with a quieter noise floor. You'll find a mixture of modes on 160 with CW, Digital and SSB co-habitating in the same space, just like the old days, and you must have a general license or higher.

Aside from a few bands not listed above, hams have access to microwave bands and even higher. Hams in other countries are often working with the (ITU) International Telecommunications Union to procure new band allocations and on the same token, working to also protect our current bands from unwanted interference. There are also hams with experimental grants that are even working with very-low frequencies, below the AM broadcast band. By the way: every ham should have a chart! Please visit the following link for the ARRL's band plan chart: http://www.arrl.org/files/file/Regulatory/Band%20Chart/Band%20Chart%20-%2011X17%20Color.pdf

(From THE PRINTED CIRCUIT, newsletter of the Tallahassee Amateur Radio Society. Author: Mike Maynard – K4ICY)

BVRC

Monthly Programs Needed!

Would you be interested in presenting a program for an upcoming monthly meeting on a radio related topic? Or, would you like to help arrange and coordinate our monthly programs? Contact Glenn, WB5L@arrl.net or Ron, K5XK@arrl.net .

BELLA VISTA RADIO CLUB ARKANSAS

NORTHWEST ARKANSAS' FASTEST GROWING RADIO CLUB...

WE'RE GLAD YOU'RE PART OF IT!

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