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the exchange

SWODXA
WWW.SWODXA.ORG
SouthWest Ohio DX Association

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INSIDE THIS ISSUE:

The Prez says…..

Wow..has the summer flown by. We are on the cusp of our first meeting back and I am looking forward to it. Many of the members have been busy over the past 3 months.

The membership team of Billy, AA8KY, and Joe, W8GEX, have been busy contacting new members and finding and inviting prospective members. They have developed a prospect list, an invitation, and a welcome letter. If you know of hams who could benefit our club by their knowledge, passion, and experience, pass their call sign along to Billy and they will contact them.

The DX Grant committee consisting of Dwight, K4YJ, Dave, K8DV, and chairman Joe, W8GEX, spent considerable time reviewing and updating the Standard orders and the By Laws to incorporate meeting attendance via ZOOM, incorporation of the internet, and a streamlined DXpedition of the Year process. We will be presenting this at the September meeting and voting on this at the October meeting so I hope you will attend them in some form.

Joe, W8GEX, and I have been working on promoting the club through our podcast. We are starting to get weekly emails asking about various aspects of DX and we hope to turn those folks in to members. (cont. on Next Page)

As we enter our seventh year of having a newsletter, I decided to make a couple of changes. The first is the format. I am experimenting with a cleaner format without all the color side bars etc. Secondly, I am trying to use a cleaner font. It is your newsletter and I would like YOUR input.

Another change is the content of this issue. We have never had a "dedicated" issue before. This issue is dedicated to 160m. Basically, this is a collection of all of the previous 6 years worth of 160M articles as well as a few new ones. I just thought this would be an interesting approach. Our friend from Ft. Wayne, K9LA, Carl, has several excellent articles included. These are all from his website and there are many more on a variety of topics. Check him out at www.k9la.us.

I recently joined the Bellbrook amateur radio club and I have really enjoyed their meetings. I was surprised to see several top level DXers including Stu, K8ST, Ken, W8ASA, and Ken, KM8AM. I believe that there are several other SWODXA members in the BARC club as well. If you are a member of another club, why not offer to give a presentation on DX? I have done several of these and would be happy to do so as well.

I look forward to working with you all again. There is a lot of DX on the horizon to I hope to "See you in the Pileups"

——-Bill AJ8B

SWODXA Club News

Upcoming Club Dates and Topics

Meeting Date	Topic
September 14th	The CQ DX Marathon by Mark Wohlschlegel
October 12th	All Things CQ WAZ and Don Quixote by Jose Castillo, N4BAA
November 9th	My 4 Square Array By Dr. Scott Wright, K0MD

SWODXA Club News (cont.)

Update from K9NW—Mike Tessmer

The week of July 3-7 was very good for me. KL7J was worked on 6m to complete 6m WAS. A few days later, FJ/K3TRM was in the log to complete 6m DXCC. All done with 3el@ 16'!

Here are some updated some numbers for the website:

Honor Roll:YES
Mixed: 352
CW: 347
Phone: 348
Digital: 311
Challenge: 2874

Comments:5BWAZ, 6m WAS, 6m DXCC, FFMA 461

SWODXA Club News (cont.)

New Member—Wayne Smith—K8FF

My interest in Amateur Radio began in the late 1950's toward the end of famous sunspot cycle 19. My parents bought me a Hallicrafters S38E receiver, I was amazed at what was coming in on 10 meters AM. It seemed like the entire world was available. That started my interest in working DX and what ever was necessary for me to accomplish that goal.

A local elmer W8GVL now SK was generous enough to help me learn code and administer the Novice test. Later in 1960, I received the call KN8WOT and began to operate on HF with my SX99 receiver and DX60 transmitter. My first DX was a CE from Chile on 15 meter CW and the hook was set! DX was my game.

By early 1961, I took the General test and got rid on the "N" in my callsign and began to chase DX in earnest. In July of 1962 I received my Mixed DXCC and later that year earned Phone DXCC mostly on AM. While still in High School I took and passed the Extra class.

About that same time I met my DX Elmer W8BF (sk), he was a very serious Dxer and was in first place on the Honor Roll. He spent lots of time with me both in person and on the phone helping me work "new ones". This was around the time when Gus W4BPD and Don Miller W9WNV circling the globe activating the rare entities.

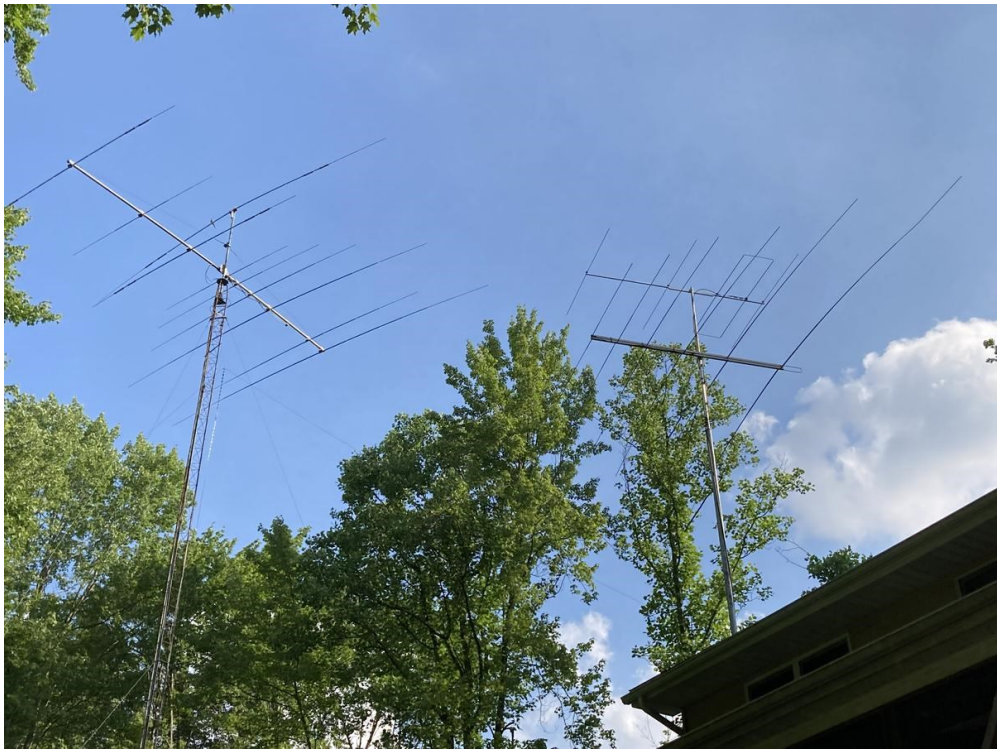
Of course college and marriage and family duties became more important than working new countries. So it took me until June 1984 to earn my DXCC First Place award. Fortunately I have been able to maintain my First place with a current total of 340/380 mixed. My current phone total is 339/367 with VP8 South Shetlands outstanding.

SWODXA Club News (cont.)

New Member—Wayne Smith—K8FF (cont.)

Recently I discovered FT8 and have worked 276 exclusively on FT8, hopefully with lots more to come.

After retiring at the end of 2019 I was able to work lots more DX including some 6 meter activity that was not available to me while working full time. Then in the fall of 2021, I decided that it was time to find something to do beside working FT8 DX. So I applied for a job at DX Engineering. It has been lots of fun and very rewarding to talk and help fellow hams decide what equipment and antennas are needed for their interests.



QRP DXing & Contesting

Randy Shirbroun, ND0C

Randy is off and running as our QRP column editor. If you have a question or a suggestion for a column, you can email Randy at randysdvm@gmail.com

Giving QRP a try.

Let's assume you're intrigued by the prospect of using QRP to DX and/or contest. You've decided to check out this whole QRP thing and find out if you can get out of your back yard with five watts. So what's next?

Equipment Options

What equipment should you use to run QRP? You may not want to take a big plunge like I did when I got rid of my old rig and bought a dedicated QRP rig. That's very understandable! In fact, in my case, I've come full-circle in that I now use a rig that is capable of 100 watts output – I just never use it at more than 5 watts. I bought my current transceiver because I wanted a sophisticated receiver with a lot of capabilities, and an operating system (menu) with which I was familiar.

Nowadays there are multiple ways to get on the air with QRP, including the simplest and easiest: just cranking down the output on your current transceiver to 5 watts, as we mentioned in the previous column. With most transceivers this is a simple process and the RF meter will confirm you're at the desired output. If desired, you can also use a low-power watt meter to confirm your power. By using your current radio, you have the advantage of familiarity with the rig, menu, etc.

Other options include purchasing dedicated QRP radios and there are many on the market. I would assess the capabilities relative to what you want and need. If you are contemplating operation in the field, one of the small, lightweight rigs might suit you. On the other hand, some of the really tiny QRP radios may be a bit awkward to use in the home "shack". There are also kits available. Some are CW only, so that is a consideration if you are want to explore QRP on

QRP DXing & Contesting (cont.)

SSB. As with full power transceivers, the dedicated QRP rigs are becoming increasingly sophisticated with impressive capabilities.

My QRP odyssey is an example of various options that might be used to "go QRP". My first QRP rig was actually the infamous "Tuna Tin II" (left) that I built from a simple design developed by Doug DeMaw, W1MR. It is a crystal-controlled 40 meter transmitter putting out 250 mW. (I chose to put it in a small cabinet instead of a tuna can.) I was able to work both coasts from the Midwest with that little radio.

When I made the leap to run QRP exclusively in 1980, I bought a Ten Tec Argonaut 509 SSB/CW QRP transceiver (pictured to the right, with some young guy operating). It had an input of 5 watts and about 3 watts output on most bands. It was an amazing radio for its time and I still have it, although I haven't put it on the air for many years.

Eventually I wanted a better receiver and more features including split VFO capability. I purchased a transceiver rated at 100 watts output which I ran only at five watts output. I also bought a smaller dedicated QRP transceiver with a maximum output of five watts, primarily for portable use, with an eye on activating Summits on the Air (SOTA). I eventually made the decision to "move up" to a more sophisticated transceiver with an excellent receiver. As I mentioned above, it is capable of 100 watts output but since I'm 100% committed to QRP, it just loafs along at 5 watts output. (To avoid the appearance of possibly promoting one manufacturer or another in this competitive market, I will avoid naming specific brands and lines of radios. Of course, there are many excellent transceivers out there from several manufacturers and we all have our own favorite brands.)

QRP DXing & Contesting (cont.)

SSB or CW?

So what mode will you use for your QRP adventure? Some hams feel that running QRP on CW is difficult enough, and QRP SSB must be nearly impossible. There is no doubt that CW can "get through" in challenging conditions when SSB might not, regardless of power level. But it would be a mistake to ignore the potential that QRP SSB represents! A few days after I acquired my first multi-mode QRP transceiver back in 1980, I entered the CQ WPX SSB Contest running three watts, and worked over 80 countries on 10 meters.

Many QRP operators have examples of impressive accomplishments running SSB. I believe my best "miles per watt" record was working Vlad, PY7/UA4WHX when he was on a globe-trotting adventure. I had worked him on many of his stops, but he was exceptionally loud from Brazil one evening on 20 meters. So I hooked up my portable QRP rig at its lowest power option of 500 mW, called him and worked him, receiving a 56 report. That was over 10,000 miles per watt – SSB no less! I was blown away!

Personally I enjoy SSB and have never felt intimidated by using it at QRP levels. Will you sometimes fail? Yes! But when conditions are right, there is a good operator on the other end, and you have a good antenna, it is amazing what can be done.

A quick comment about the digital modes, such as FT4 and FT8: I have made the personal choice to continue my QRP adventures with only SSB and CW and do not use the newer digital modes. Obviously, since FT4 and FT8 were developed for weak signal work, they are an option for QRP operation – they're just not my "cup of tea".

Antenna

Now that we've discussed the transceiver considerations, what about an even more important part of the station: the antenna and feedline? In most situations, you're stuck with what you already have, which is OK – we may just want to optimize it if possible. What we need are efficient antennas, the higher the better, and in the clear. – The same for any power level. And if you have a directional antenna, a Yagi, a hex beam, or a quad, even better! It is really important that the feedline is low-loss and the antenna is well-tuned with a low SWR. Since we're only putting five watts out of the back of the rig, we can't afford to be losing any of that power! And the benefit of a gain antenna is obvious!

QRP DXing & Contesting (cont.)

Now What?

A few basics to remember as you "dip your toes" in the QRP waters…. You certainly can't out-muscle other stations, so you need to "choose your battles". This may take a bit of getting used to if you have been running a hundred watts, or more, in the past. Prepare to be humbled! You have to be at the top of your game with operating techniques and ethics, which we will explore later in more depth. Calling on top of other stations is usually futile. Good timing has to make up for the lack of brute power!

When first using QRP for casual DXing, I'd suggest just tuning the bands looking for strong stations with few callers. An example of a good one to try first might be S51DX – Janez always has a big signal and nearly everyone has worked him, so there shouldn't be much of a pile-up! If you want to use packet spotting, keep in mind that those spots might result in some challenging pile-ups.

A few operators will call a DX station with full power, say 100 watts, then ask the DX to listen for their QRP signal. But that is not considered "good form" and is frowned on by the QRP purists. To really claim a contact as one made with QRP, you should initiate the QSO with QRP power levels.

In general, you will have the best results on the highest band that is open. When the 10 and 15 meter bands are open, that is where you want to be when operating QRP, regardless of mode. With the current improvement in conditions, 10 meters should be awesome for the next few years.

On the other hand, some folks may feel that attempting to use QRP on 20 meters, especially SSB, is insanity. Not true! Granted the increased QRM can be challenging, but I'm never bashful about spending a lot of time on 20 meters in contests. It can be tough to work DX on 40 and 80 with QRP, especially with SSB, but it is doable! You won't know if you don't give it a try!

Any of the major contests, as well as state QSO parties, offer chances to try QRP power levels. The fast rate of contacts provide a good opportunity for even a non-contester to pick up a lot of QSOs. And if you want to get serious about a contest, keep in mind that most of them now have QRP categories. Although you are competing against kilowatt stations for contacts, you have a chance to still nab a certificate! We will take a deeper dive into QRP contesting in a future column.

QRP DXing & Contesting (cont.)

You may be tempted to add "/QRP" to your call at first to let the DX station know there is a QRP station calling. But I think you will quickly decide to discard that tactic. And it is certainly not effective or desirable when contesting! It takes much more time and in marginal conditions can be confusing.

And on a related topic, if a station is making a directional CQ, going "by the numbers", coming back with a partial call-sign that is definitely not you, or making any similar call that does not apply to you, running QRP does **not** give you license to just throw in "QRP" to get their attention. In other words if a rare DX station is asking for west coast stations and I'm in Minnesota, I should never drop my call in, or say "QRP", trying to justify it since I'm running just five watts. It is just not cool and isn't good operating ethics. Period. QRPers should always hold ourselves to the highest possible standards.

So until we "chat" next time, here is my pitch (again) to give it a try, on either SSB and CW, or both, and on various bands, to see what is possible!

73,
Randy, NDØC

60 Meters—The Channel Band

By Joe, W8GEX—w8gex@aol.com

Facebook: https://www.facebook.com/groups/347995275954755/

60m website: www.60metersonline.com

August 25, 2023 by Joe Pater W8GEX

Thanks to those of you that donated money to renew our domain name and the website. We all appreciate your generosity so we can keep up-to-date.

If you have any 60m news to share, please send it to me at w8gex@aol.com, and if you know anyone going on a DXpedition, ask them about getting on our band.

E51D - They have moved: Now the RIB "Rig in a Box" team will be active on North Cook from Aug 21, to Sept. 6, and will - as always - be on 60 meters. QSL to HA7RY via clublog.

4W8X Timor-Leste - NEW COUNTRY: A team of 20+ skilled and experienced operators from Germany, Poland, Austria, Hungary and England will be active from Timor-Leste in November 2023, and plan to be on 60m.

TX7L Marquesas Island - NEW COUNTRY : TX7L by a German team will be on 60m from November 4 – 19, 2023.

PY0T - Trinidad and Martin Vaz Islands - New Country : PT2IC, PY1ZV and PY6RT plan an operation for 3-4 days in November. Call sign PR0T at the PY0T station. Not 100% sure they will have time for 60m.

60 Meters—The Channel Band (cont.)

EL2GB Liberia – New country: Richmond was active only one night on Tuesday, August 22.

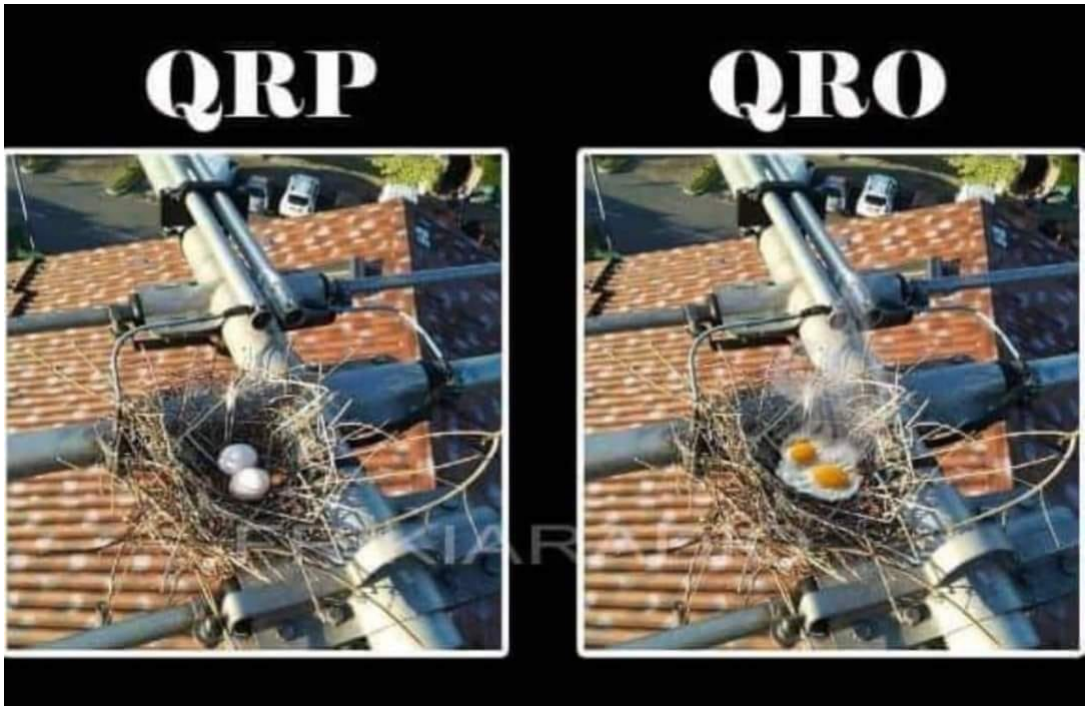
ZD9W – Tristan-Da-Cunha - New Country: Juris YL2GM should be on 60 from 9/24/23 to 10/22/23.

FH – Mayotte TO8FH– The TO8FH DXpedition team has announced their transmit frequencies: FT8 5.357 and CW 5.351.5. The trip will be from October 10 to 22.

T2C–Tuvalu : Oct.10 to 30: CW on 5.354, FT8 5.357

FO - French Polynesia: TX6D will be October 2-15. With 5MHz permission granted now in France and its territories, they will also get on 60M.

5X3K Uganda: This will be put on by the Czech Republic team that won the DXpedition of the Year award for the TN8K trip to the Republic of the Congo. Look for them Sept.28 to Oct. 8.

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Top Band to the Rescue

How an Enterprising Young Radio "Ham" Escapes His Kidnappers. By T. Turner, K8VBL

Thanks to K9LP, Philip and the author, Tom Turner, K8VBL, for permission to reprint. This originally appeared in the K9YA Telegraph.

When Jerry was in his senior year in high school, he had an after-school job at Neilsen's Radio & Appliance. His boss, Mr. Neilsen, was an amateur radio operator who coached several boys, including Jerry, to help them obtain their Class A amateur radio licenses. The group of young people, including Mr. Neilsen, held a roundtable in Morse code on the 160-meter amateur radio band at eight o'clock on Friday evenings. Some of the fellows had rather simple equipment, like Doerle-type regenerative receivers and '01A Hartley oscillator transmitters powered by old "B" eliminators.

One Friday evening Jerry worked late at Neilsen's and walked along a darkened street to a bus stop. A green Hupmobile sedan slowly passed him, and its mechanical brakes squealed as it slowed for a turn. Jerry thought, "The linings are probably worn to the rivets" he recalled from a motorcar safety program two police officers presented to the high schoolers. But his mind then turned to the thought of a warm supper at home, and the Friday evening roundtable.

Suddenly, the Hup's brakes squealed behind him. When he turned, he saw three masked men, two holding handguns, emerge from the car. A man popped a black bag over his head and put handcuffs on his wrists. The men then shoved him into the back seat and the car pulled back into the street. Jerry was stunned and afraid, as he remembered when the Lindbergh baby was kidnapped a few years back.

The car made numerous turns and then stopped after what seemed like a considerable distance. Jerry, with a man on each side, was taken into a building where he heard people talking in some Asian accent. There was a smell of food cooking, but Jerry was too frightened to think about eating as he was led up three narrow, creaking, flights of stairs. A door was unlocked and opened, and he was shoved through it.

Top Band to the Rescue (cont.)

The black bag was lifted from his head, and one of the men took his wallet, pen and pencil set, wristwatch, and Boy Scout pocket knife, while the other two stood by with handguns. The men still wore masks. Jerry blinked at the single bright bulb above his head and stammered, "What's going on?" The man who frisked him replied, "Yer old man is a wealthy fat cat. We're gonna hold yous for a leetle ransom. If there be any monkey business, yel'l be punished... Understand?" "There's three of us, an' two will be right outside the door at all times. We'll be checking on ya periodically. There's stuff to read and a radio, but keep it low." The men removed the handcuffs and left the room. Jerry heard the lock click.

Jerry took stock of his situation. The shabby room had one light bulb that dangled from the ceiling, with a Y-tap and extension cord that led to a small cathedral radio he recognized as a Philco 80. On the table was a stack of dog-eared *Reader's Digest*s. The room had one window with small, steel-framed panes that looked out on to an air shaft. Light from windows several floors below dimly illuminated the shaft. Jerry noticed a corroded window lead-in strip for a radio aerial under the sash and a lead-in wire that went up the air shaft, probably to an aerial on the roof. Off to one side of the room was a "bathroom" that had its door removed. Inside were a grimy high tank toilet and a tiny sink with one tap. Jerry thought this was probably a typical cold water flat. But where is he? The car had taken so many turns and driven such a distance he had lost track.

Just then, the door opened slightly and a box was pushed into the room. There was no lettering on the box, but it contained food, a bowl of chop suey. It had the same smell he noticed in the stairwell. The chop suey was good, but not like the corned beef and cabbage his mother had planned for supper. Also in the box was a fortune cookie. Jerry cracked it open and read his fortune, "You will soon be liberated." On the other side of the fortune slip was "Hop-Sing Deli, 910 Seventh Street." Jerry now knew he was in a third floor flat above a Chinese deli on 7th street!

Top Band to the Rescue (cont.)

Jerry snapped on the little Philco. He was familiar with the Model 80, since he worked on several at Mr. Neilsen's shop where he replaced the troublesome Bakelite-cased condensers. The Philco's aerial wire had been disconnected from the lead-in strip and was laying on the floor. He thought that perhaps the wire was grounded or had come down. In a few seconds, the Philco came to life and Jerry turned the dial. The typical apartment house electrical noise was present, but the radio seemed to pick up numerous stations. After he connected the Philco's aerial wire to the lead-in strip, the volume increased and the sound became distorted. Obviously, the outside aerial was a good one, and had been erected for an old, less sensitive, TRF radio. It was probably disconnected from the Philco superhet because of overloading.

The station he tuned in announced the time as 7 p.m. The 160-meter net would be on in an hour. Jerry considered he could possibly build a transmitter from parts in the Philco, and send a distress message. The Philco had a transformer power supply that put out 200 volts, and a 42 output tube that would make a dandy Hartley oscillator. He remembered from reading the *Radio Amateur's Handbook* that the resonant frequency of a tuned circuit was inversely proportional to the number of turns in its coil. If he set the Philco's tuning condenser to 900 kc and removed half the turns from the antenna coil, it would resonate in a Hartley circuit at 1800 kc in the 160-meter band when it was connected to the aerial... Maybe! But if the kidnappers caught him disassembling the radio, he would surely be punished as promised.

Then a better plan crossed Jerry's mind. He remembered Mr. Neilsen's disgust with the interference caused by oscillator harmonics from these cheap superhet broadcast sets. Jerry knew the Philco 80's intermediate frequency was 450 kc, so if he tuned the radio to 1350 kc, its oscillator would be at the 160-meter net frequency of 1800 kc. He could then use the radio as a transmitter without modification! He broke off a small piece of aerial wire and connected the remaining length of wire to the lead-in strip and the cathode pin of the Philco's converter tube.

Top Band to the Rescue (cont.)

He used the small piece of wire as a telegraph key to short the tuning condenser oscillator stator plates to ground to stop and start the oscillator signal.

The idea appeared to be working. Police radio bands were next to the 160-meter amateur band at both ends. If his signal was out of band, high or low, this could be a good thing. When the station announced 8 p.m., Jerry tuned the Philco to WADC in Akron at 1350 kc and began to transmit in Morse code by alternately grounding the oscillator tuning condenser. SOS SOS I AM KIDNAPPED ES IN 3 FLOOR FLAT ABOVE HOP SING ON 7 ST JERRY. He continued transmitting the message over and over for about 30 minutes until he heard a key click in the door lock. He quickly took his hand out of the back of the radio and turned facing out. Two masked kidnapers peered in to check on him, and then locked the door.

About 10 p.m., Jerry awoke from a fitful sleep to the sound of scuffling in the hallway. There was a gunshot, and then a loud voice, “Police, Are you in there Jerry?” When Jerry answered, the doorframe splintered and two burly policemen burst into the flat. Jerry recognized the officers as Sgt. O’Rourke and his partner Skalski, who had presented a safety program. Tears began to flow, and the kindly old Sgt. O’Rourke put his hand on Jerry’s shoulder. “You’re a very brave and resourceful young man. Are you okay?” After Jerry affirmed he was, he was led to a waiting police car.

As they drove, O’Rourke explained that one perp had pulled a gun and was shot dead, and another was taken into custody. “Were there others?” Jerry replied there were three men, two of whom displayed handguns, and the third may have escaped in a green Hupmobile with squeaky brakes. Officer O’Rourke then grabbed the police radio mike and announced “Unit 5 to Kop - Be on the lookout for armed kidnapping suspect in green Hup with squeaky brakes.” A few minutes later, a call came in over the radio “Apprehended suspect in green Hup—Ransom note found on front seat.”

Officer Skalski then explained the workings of the police radio system. The cruisers called the station on a 9-meter wavelength via a small 7-foot aerial on the rear of the car. The station called the cruisers on a 180-meter wave that could be received on the car’s regular broadcast set that had been retuned by police radiomen.

Top Band to the Rescue (cont.)

Sgt. O'Rourke remarked that the new 85-horsepower Ford V8 cruisers were about the fastest cars on the road, especially since they had been "hopped up" a bit with dual exhausts and Stromberg carburetors.

When the police cruiser arrived at Jerry's home, he noticed Mr. Neilsen's new Auburn coupe parked in front. As he got out of the cruiser, Jerry's parents and Mr. and Mrs. Neilsen and their daughter, Ingrid, came running out the front door and embraced him. Mr. Neilsen explained that Jerry's wavery-sounding distress signal was picked up by the amateur radio net, and he had telephoned the police.

Jerry's parents called Mr. Neilsen when he had not come home to supper, to determine if he was still working. When they heard he had left the shop, they called the police to report him missing. Sgt. O'Rourke remarked that the police received a long-distance phone call from a "ham" in Ashtabula who picked up Jerry's distress message. After thanking the two officers, the two families, much relieved, enjoyed a late-night supper of corned beef and cabbage.

Thanks to retired police officer Harry, N9CQX, for info on early police radio.

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Getting on 160 Meters

By Mike Suhar, W8RKO

In the past I have never thought much about 160 meters. A few years ago I thought I would give it a try. For an antenna I have a 90 foot tower so an inverted-L looked possible. A couple of 70 foot trees on the corner of the suburban lot would provide an anchor for the horizontal part of the L. I ran about 80 feet up the tower and the remainder of the 134 foot wire went to the tree. I don't climb trees so the best I could do for an anchor point was a 20 foot extension ladder into the tree. Ran a rope through a pulley and out to an insulator supporting the wire. The horizontal part of the wire would be sloping down from 80 feet at the tower to about 25 feet in the tree. Fortunately the tree was far enough away that the wire insulator ends before reaching the tree. That insulator might be 30 feet above the ground. That would have to do for now. The wire is 5-feet off of the tower. I planted 11 radials at the base. Because of the house the radials span 180 degrees east, through south, to west. Based on my examination of velocity factor of wire in the ground I made the radials 67 feet. I never did much with that antenna for a couple of years. Now that FT8 is the hit of the bands I fired that up this winter. The inverted-L works great on transmit. On just about any night PSKREPORTER indicates I am being heard in Europe with good reports. Strong signal reports all over the US. As for receive, well that is a problem. I hear hardly anything out of Europe. Maybe three decodes on FT8 vs triple the reception reports of my transmissions out of Europe.

I have one particular problem at my QTH. I live within 2 ½ miles of WHIO, WING, and WONE AM transmitters. Measuring signal levels on the inverted-L using a Frequency Selective Level meter shows WHIO and WING both at +10 DBm during the day when they are on their omni pattern. At night they drop under 0 DBm. At those levels the radios get overloaded. An LED lights up very bright when I place it across the coax line in the shack. I have put BCB filters on the receive lines which helps the situation.

Getting on 160 Meters (cont.)

Trying to use an antenna analyzer is impossible under those conditions. My Array Solution analyzer allows for calibration at the measurement plane so I build a custom 3-notch filter and was able to calibrate it out so I could measure the inverted-L. Resonance (phase 0 crossing) is around 2 MHz. The "R" value is around 20 ohms so SWR is high even at resonance. That is OK as I can use a shunt coil to get where I need to be. I like shunt coils as gives me a DC grounded wire. At this time I am doing only FT8 so a single coil works. Eventually I will put a remote controlled roller inductor out there so I can cover the entire band.

At the W4DXCC SEDCO conference it was suggested I use a different solution for receive. I built a K9AY loop system. I had my doubts that it would perform as it is built on a suburban lot with the tower and inverted-L nearby. Power lines are on the south and east side of the property. The first night playing with it I was listening around on the top end of the broadcast band. I noted some directivity between the two loops. I was able to null out one station replacing it with another on the upper end of the broadcast band. Below 1 MHz performance appeared to drop off but I did copy many WSPR stations on 630 meters as well as several aircraft non-directional beacons.

As for directivity in the 160 meter band I need to experiment with the terminating resistor. I have a 1K pot out there for that purpose but recent weather has not allowed me to make changes. At the moment it is set to 450 ohms. Listing to SSB or AM QSOs it appears I get around 2 S-units of directivity. As for background noise I see no reduction. All my noise is equal in all directions. Nothing there to null out. On the inverted-L my S meter idles at S9. On the K9AY it sits at S5. All that really means is the inverted-L picks up more signal (noise and signal) where the loop hears less noise and less signal. Overall the Signal to Noise Ratio (SNR) is the same. I am interested in improved SNR. For this test I monitored several voice QSOs. While I could peak on a particular station by switching loops I don't think I really observed better SNR. A typical example was a voice round table of three ops. Two had strong signals. The third was right at the noise on the Inverted-L at S9.

Getting on 160 Meters (cont.)

On the K9AY, the station was around S5 but still right in the noise. No real SNR improvement. I think objects on this suburban lot is reducing the performance of the loop. I still switch back and forth between the inverted-L and the K9AY loops taking what sounds best. Depending on the signal one may slightly outperform the other. If I had a noise source in one direction I suspect the K9AY would show an SNR improvement.

My next experiment will be to build an 8-foot tuned loop for receive and compare that to the K9AY loop. With that information I will decide if the K9AY, 8-foot loop, or just the inverted-L are used next winter.

Shunt Feeding my Towne for 160M

By John Comella, N8AA

Years ago at my Euclid, Ohio QTH I had a 60' free standing Universal Tower that I shunt fed for both 160 and 80. Each tower leg was connected to an 8' ground rod. No radials until the lawn was dormant in autumn then I laid out many radials in a random fashion. The radials folded back and crossed over/under other radials and were of no particular length.

For 160 the shunt arm, maybe three feet in length, was attached at the top of the tower. The gamma wire attached to the end of the shunt arm was #10 wire that dropped to ground level where it was attached to an omega matching network.

For 80, the shunt arm was also probably about three feet in length. It was attached on another side of the tower at about 40' from the ground. The gamma wire was #10 that dropped to ground level where it too, attached to an omega matching network.

This arrangement performed well. I managed DXCC on 160 and DXCC+ on 80. A city location with lots of noise.

Shunt Feeding my Towne for 160M (cont.)

It is imperative when shunt feeding a tower with a beam on top that the beam elements are attached directly to the boom and the boom attached directly to the mast and the mast connected to a tower leg with a flexible braid. A Hy-Gain beam is ideal for a "top-hat" since all the elements are attached directly to the boom.

I found without the flexible braid connected to a tower leg the SWR undulated.

Beams with elements insulated from the boom will not work! RF will arc from the boom to the elements.

There is also much info in ON4UN's Low-Band DXing book.

At my Oxford QTH I used an inverted "L" for 160 and a separate inverted "L" for 80. Both antennas worked very well. There were 1-1/2 miles of radial wires!

I have a vague recollection of trying to shunt feed the 70' tower that was located directly behind the barn at the Oxford QTH. My notes are incomplete and apparently this shunt fed failed. You may recall that this tower had a 40 meter W6NL Moxon and a 12/17 meter Yagi on top. I recall blowing up the balun on the 40 meter Moxon. The elements on the Moxon are insulated from the boom. Hence the 80 meter inverted "L". Some things are learned the hard way.

I haven't any pictures. On my QRZ page there is a picture of the Euclid QTH and the tower but the picture shows very little of the tower.

The Magic of 160M

By Lee Barrett – K7NM/VP2MLB
West Point, UT DN31xr

Like a lot of hams, I've always lived on a lot the size of a postage stamp. Now is no exception. The thought of 160m operations had been illusive for my 55 years in the hobby. On my last DXPedition to VP2M in December 2018, 160m operations became as focused as a laser. Four of us decided to go to Monserrat (my third trip) and try our hands at the ARRL 160m CW Contest. You must understand, NONE of us are "dyed-in-the-wool" contesters – just four "geezers" who wanted a ham holiday away from the snow and gloom of Utah for 10 days. However, we did spend nearly six months in the planning stages.

We purchased a full size 160m dipole for use in transmitting. At the Gingerbread Hill location (see Gingerbreadhill.com) – the Lea family is more than ham friendly. There is a motorized 60-foot crank-up tower installed next to the rear of the villa and accessible from the roof. We, however, elected to go with all wire antennas rather than a Yagi for upper bands because of the time it takes to assemble them. We rather be operating. We hung our 160m dipole center balun at the top of the tower. The Gingerbread Hill villa looks over the western ocean from about 800 feet above the shoreline. A great height advantage for this band.

We used DX Engineering Beverage Antenna boxes along with a pre-amp and a feedline choke (built from a presentation by Tim Duffy, K3LR, given at Visalia in 2018). The Beverage was made from 300 Ohm TV twin-lead and measured 700 feet long. It was terminated for the US direction. All of it worked perfectly! We had an S6-S7 noise floor on the dipole and an S1-S2 noise floor on the Beverage which was laying on the ground most of the way along it. We had to put a "goat choke" in about half-way along the Beverage – there was a goat chained to a stake within nibbling distance of the antenna. We had to angle the antenna 10 degrees away from the goat and then back 10 degrees once past. This did not seem to affect the results. We were working pre-contest stations in Arizona at 4 pm Arizona time with

The Magic of 160M (cont.)

good signal reports along with similar reports from other western states.

We broke the contest up into 3 hour shifts with 1 hour of overlap on each end so the next operator could take over without being "cold" as to operation conditions when sitting down. This worked well. We also found that we could hold a frequency for several hours. There were the usual LIDs too deaf to hear us so we did move a couple of times. But, in general, our signal was apparently pretty strong. We had two of our group who were relatively new to CW but learned quickly to hold their own. We used a K3/KPA500 combination at 500W.

We were totally stunned to learn that we won the Multi-operator, Single Transmitter, High Power, DX Class category for the contest! Equally crazy was that my Elmer from 1966 (Larry Comden - K3VX) led a group to Bermuda who won the Multi-operator, Single Transmitter, Low Power, DX Class for the contest! I was bit by the 160m bug!!!

After returning home, I looked at my sad trapped 160m dipole which had only served as a "noise collector" for the 25 years at my current QTH. It had a bandwidth of 5kHz on a good day. Something had to be done.

The time sequestered in my home hiding from the threats of Covid 19 allowed for some time to ponder the postage stamp. That sprouted an idea. Though my lot is small, it backs up to a parking lot for a church. There is a perimeter fence around the parking lot. My tower is back against the fence. What if……???

I pulled the yardarm off the tower that supported the pulley holding up the old 160m trapped dipole and turned it so it protruded to the West of the tower instead of toward my lot to the East. I went 130' to each side of the tower in my yard and asked the neighbors if they would mind a wire with a rope tied to it being tied to the fence top behind their houses. They all agreed it was "no problem".

Ah-ha – I could now put up a full sized inverted-vee on the back side of my tower along the church parking lot fence line. This will be a snap, I thought.

The Magic of 160M (cont.)

I bought stranded antenna wire, insulators and rope on-line along with insulators and a 50 Ohm – 50 Ohm balun especially wound for lower frequencies (e.g. 160m). On a nice day, I had my YF helped me roll out the lengths and put the insulators and balun together. Glenn Dixon (AC7ZN) and his grandson Chris Thompson (KA7ADN) came the next Saturday and up the antenna went. Initially, it was resonant at 1.7MHz. No sweat – just cut a few feet of and we will be there. After doing so, a sweep of the SWR showed the best I could get was 1.7! The bandwidth of this full-sized dipole was almost as bad as the old 160m trapped antenna at about 10kHz! Something didn't smell right.

I took out the balun and checked it. Overall, it was not as good as hoped for – but over the 160m frequencies, it was not the problem. A "Cobra-head" was purchased (no balun feed for a dipole) and installed. There was basically no difference. This was very puzzling. Next, the stranded antenna wire was replaced with #14 sold wire from Lowes. Remarkably, the SWR and bandwidth improved – but only slightly to around 1:6 and approximately 15kHz.

The following weekend, I prepared a "Test Setup". First, using my AA-30 RX bridge, I measured the electrical length of a 50' length of pre-made RG-8x I had. Remember, the wavelength in coax is "shorter" than in free space because the speed of the wave gets bogged down traveling through the coax insulation material. One must know what the actual electrical length is of the coax – not its measured length.

Second, I measured out another dipole to 136 feet per leg – longer than the 160m length – so it would resonate below the 160m band. These legs were hooked to the Cobra Head along with the RG-8x and the antenna was raised with the help of my oldest grandson, Connor (no call – "yet"). By this time, I had purchased a NovaVNA and we used that device measure the SWR, Resistance (R) and Reactance (X) across the 160m band. We started with the full length. Then we successively cut off eight (8) foot lengths – three times – and repeating the measurements. We ended up with four sets of data points.

The third task was to dust-off the Smith Chart usage methods and "rotate the R and X values" measured at the coax feed point to what

The Magic of 160M (cont.)

the R and X values were at the Cobra Head using the electrical length of the RG-8x. Once the feed impedance of the wires at the Cobra Head were known, a regression was done through both the R and then the X points - both versus antenna length.

The lights came on! Normally an inverted-vee feed point impedance (at the center) is around 75 Ohms – **BUT ONLY** if the center point is around a quarter-wavelength above the ground. For 160m, that would be 125 feet to the center above the ground. My 50 foot tower does not begin to approach that. As the center feed point is lowered, the center point impedance also drops. From my graphs, it was obvious that my feed point impedance was in the neighborhood of 28 Ohms when the X value went to zero (0) – better known as resonance. Glenn also modeled the antenna in EZNEC and came up with the impedance.

The last step was to purchase a 25 Ohm – 50 Ohm balun and install it on the antenna. At last! The SWR at resonance dropped to 1.2. The bandwidth is from 1.8MHz – 1.87MHz without a tuner and easily tuned for the rest of the band with a tuner. It is also amazingly quiet with a noise floor generally around S6 – sometimes lower. However, the next project is to get my receiving loop running for comparison. The second night around 11 pm local time running 200 watts of FT8, I was called by a ZL2 and easily worked him. Subsequent to that I have worked a 5T5, several Europeans and last week an E51 - all on FT8. The E51 gave me a received signal of +2dbm!

In addition, I worked a number of hours of the ARRL 160m CW contest in December 2020. Everything I could hear (even in the weeds) I could work within a couple of calls.

Lessons learned:

1. The operation just above the AM broadcast band is a fun challenge and achieving an effective antenna is not simple.
2. If your dipole (or inverted vee) is below ¼ wave high at the center feed point, check for a low impedance feed or you will lose 2:1 (or less) SWR bandwidth.
3. There are off-the-shelf 25 Ohm to 50 Ohm baluns that remedy this issue.

Who knew that 160m could be this much fun????

Another Simple 160-Meter Antenna

By Carl Luetzelschwab K9LA

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A previous issue of the ARRL National Contest Journal had a great article on a simple 160-Meter antenna. The article was titled The Easy Inverted L for 160, and was authored by Steve Carr, NEØU. The simple antenna was a single-radial Inverted L. The purpose of this column is to compare the single-radial Inverted L to another simple 160-Meter antenna—the Inverted V. It may do much better than you expect if it is oriented properly.

Using GNEC Version 1.6 (www.nittany-scientific.com) running the NEC4 core, I modeled a single-radial Inverted L over average ground (relative dielectric constant = 13, conductivity = .005 S/m). The vertical portion starts at 1 foot, goes up 60 feet, and then slants down to 15 feet (slanting it down gives a convenient tie-off point to a tree or structure). The single radial is 129 feet long and is 1 foot high. Figure 1 gives pertinent information for this single-radial Inverted L.

Note that the slanted portion of wire runs in the opposite direction of the single radial.

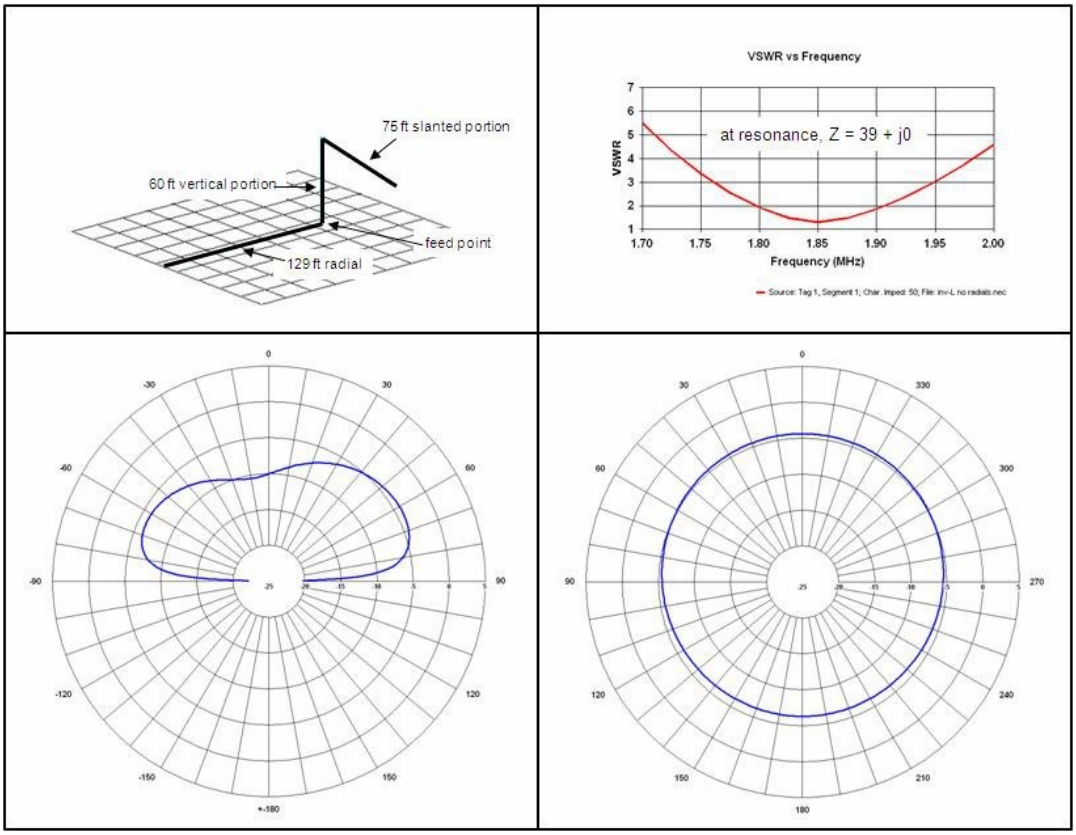

Fig. 1—A single radial Inverted L

Another Simple 160-Meter Antenna (cont.)

I did this because this is how a single-radial Inverted L would be implemented at my QTH. The vertical portion would be supported by a tree at our property line, the long single radial would run off into the woods, and the slanted portion would run back to the house.

The upper left image in Figure 1 is the physical configuration of this antenna. The upper right image is the SWR. The lower images are elevation (left) and azimuth (right) patterns.

The SWR at resonance is 1.3:1 (50 ohms divided by 39 ohms), and the 2:1 SWR bandwidth is about 100 KHz. Most modern rigs (and amplifiers) will be happy with a 2:1 SWR without any additional matching. From the elevation pattern, the gain maximizes at around 25 degrees elevation at about -4 dBi. Both patterns show slight asymmetry (directivity). With most of the radiation vertically polarized (due to the 60 foot vertical portion), this antenna should work well for most of us in North America (see the Polarization section at the end).

One caveat is in order. The resistance at resonance at the feed point of the single-radial Inverted L will vary based on your configuration. See the Inverted L Impedance Trends section at the end of the article for more information.

Now let’s look at an Inverted V. Figure 2 gives pertinent information for a 160-Meter Inverted V with its apex at 60 feet and the ends 30 feet high.

The SWR at resonance is 1.6:1 (50 ohms divided by 31 ohms), but the 2:1 SWR bandwidth has decreased to about 50 KHz. From the elevation pattern, the gain maximizes at about +7 dBi ñ but it maximizes straight up (since it is at a relatively low height in terms of wavelengths). The azimuth pattern shows the classical figure 8 pattern for both the horizontal and vertical components of polarization. Note that vertical polarization, what most of us should generally use in North America, is off the ends of the Inverted V.

Let’s take a more detailed look at the gain of these two antennas. Figure 3 gives this data in terms of vertical polarization for elevations angles from 5 degrees to 50 degrees.

Another Simple 160-Meter Antenna (cont.)

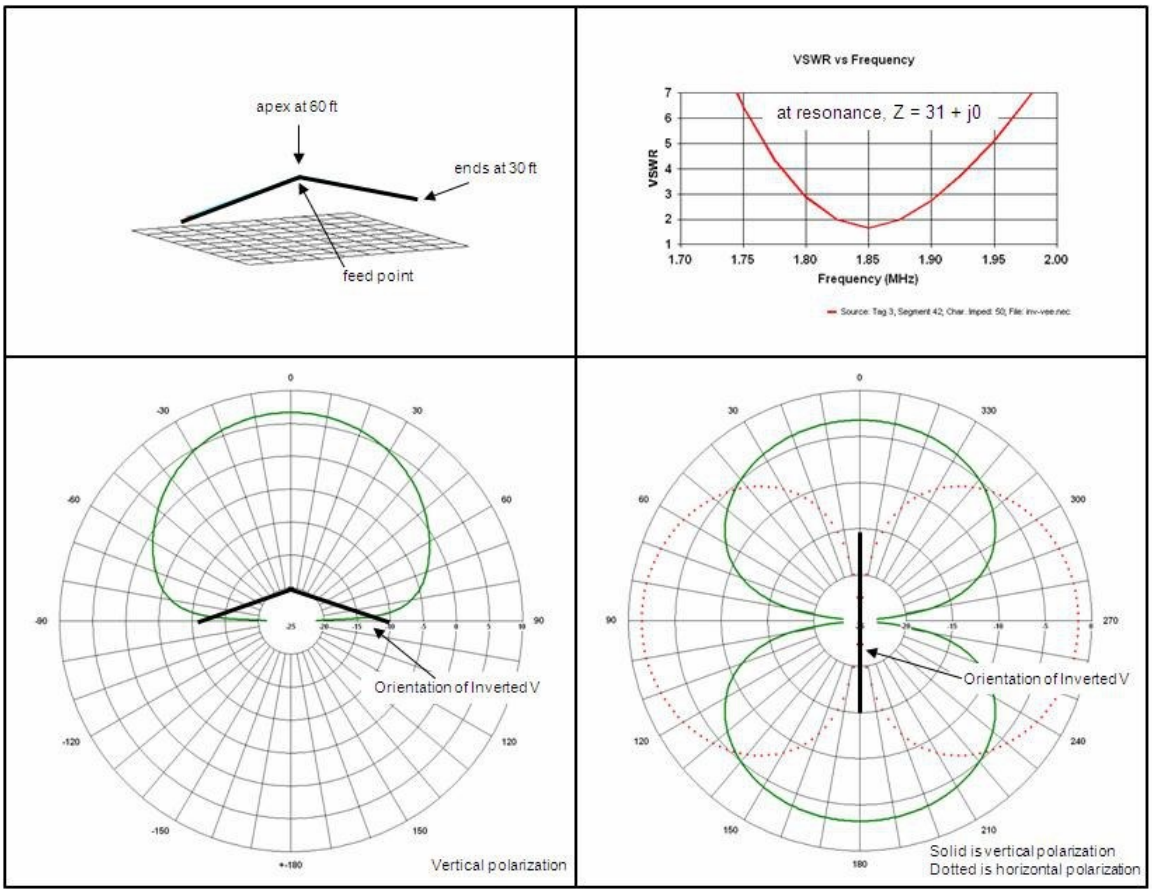

Fig. 2—An Inverted V

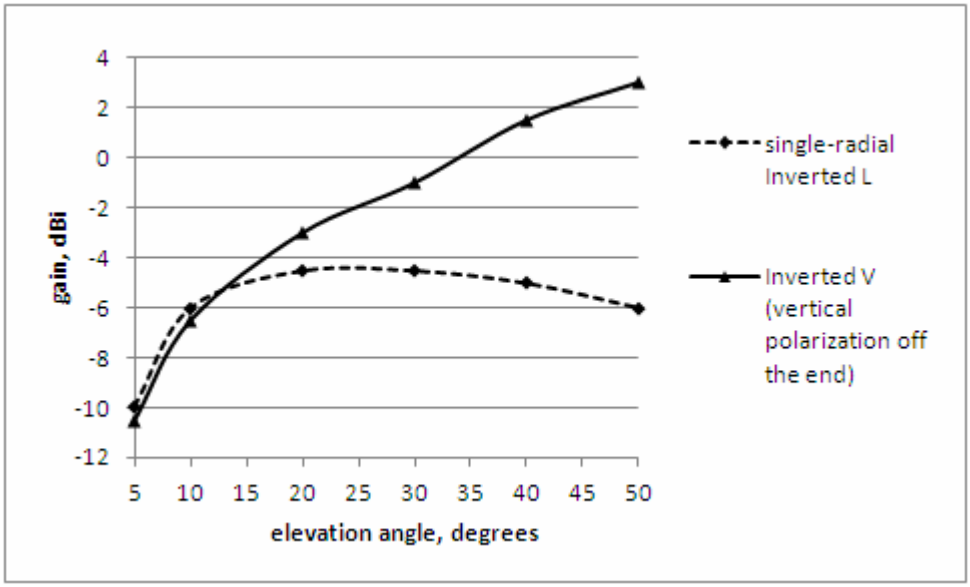

Fig 3—Comparative Gains

Another Simple 160-Meter Antenna (cont.)

At extremely low elevation angles the single-radial Inverted L has a slight advantage. But the Inverted V exceeds the single radial Inverted L at elevation angles greater than about 15 degrees. So the Inverted V, properly oriented so that the wire is in the direction of the target locations (off the ends of the antenna), can be another simple antenna that puts out a very workable signal.

I have had on-the-air experience with both of these antennas (although not a single-radial Inverted L). When my six-radial Inverted L for 80-Meters and 160-Meters (three elevated 120-foot radials on 160-Meters and three elevated 60-foot radials on 80-Meters) came down in high winds several years ago, I put up a temporary Inverted V (apex at 60 feet as in the model) with one wire heading south-southwest and the other wire heading west-northwest (that ís what fit on my property). I believe I have not given up much when working stations in the directions of the wires. By the way, this temporary Inverted V is still up because it is simple and performs well in contests. To achieve the last dB for DXing, though, I would definitely re-install the multiple- radial Inverted L.

With the March/April 2011 issue of NCJ and with this issue, you have two choices for simple but effective 160-Meter antennas. You won’t be king of the hill with these antennas, but you’ll certainly work your share of domestic and DX stations.

Inverted L Impedance Trends

The feed point resistance at resonance of your single-radial Inverted L will depend on your ground conditions, how much of a vertical portion you have, how much you slant down the ìhorizontalî portion, and the direction of the radial with respect to the direction of the horizontal portion.

Of the four variables given above, the two biggest players are how much of a vertical portion you have and if you slant down the horizontal portion.

Another Simple 160-Meter Antenna (cont.)

As you shorten the vertical portion and use more of a horizontal portion to achieve resonance, the feed point resistance decreases. As you slant the horizontal portion down more and more, the feed point resistance also decreases. These effects are seen in Figure 1 ñ if the vertical portion was around 90 feet (instead of 60 feet) and if the horizontal portion was truly horizontal (instead of slanting down), the feed point resistance at resonance would be right around 50 ohms (instead of 39 ohms).

Polarization

Because the ionosphere is immersed in the Earth's magnetic field, there is more order to polarization than generally acknowledged. At HF (3-30 MHz), circular polarization is the norm. But at 1.8 MHz, polarization tends towards highly elliptical (i.e., near linear). Additionally, the extraordinary wave (one of two characteristic waves that propagate through the ionosphere) is heavily attenuated around 1.8 MHz (because 1.8 MHz is close to the electron gyro-frequency), leaving the ordinary wave as the only useful characteristic wave on 160-Meters.

For most of us in North America (and generally those in the northern hemisphere worldwide), vertical polarization provides the best coupling to the ordinary wave. Thus vertical polarization is generally the best way to go. Be aware that at times, due to short-term variations of the ionosphere, horizontal polarization will be best. Thus the old adage you can't have enough 160- Meter antennas applies.

An Introduction to Operating on 160M

By Carl Luetzelschwab K9LA

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Operating on 160 meters has always been a challenge. Two of the biggest challenges are the physical size of efficient antennas and noise when receiving. The purpose of this article is to provide appropriate information to address these two challenges, along with general information about other issues necessary to get your feet wet on topband (also known as the Gentleman's Band).

SSB or CW?

The 160m band has been around for a long time. In the First Edition of the Radio Amateur's Handbook (1926, published by the ARRL), Amateurs had an allocation from 150 meters to 200 meters in wavelength (that's 2 MHz down to 1.5 MHz). Due to AM broadcast stations and other services, the 160m band was eventually narrowed up to 1.8 – 2.0 MHz.

An Introduction to Operating on 160M (cont)

Because of LORAN issues (LORAN is a radio location service), there have been power and frequency restrictions over the years. For example, during my early years in Amateur Radio in northwest Indiana (early 1960s) I could only operate from 1800 to 1825 KHz with a maximum power of 200 W during the day and 50 W during the night. There were similar restrictions in other areas of the country.

Nowadays those of us in the US can operate anywhere from 1.8 to 2.0 MHz at up to 1500 W PEP output. Of course you should always strive to use the minimum power to make the QSO.

The first order of business for an introduction to 160m is to look at the band plan for 160m ñ what frequencies should we use for CW, what frequencies should we use for SSB, what frequencies should we use for AM, etc.

160M Band Plan

Unlike our HF bands, the FCC (Federal Communications Commission) does not regulate 160m with respect to band segmentation by mode. Legally any mode can operate anywhere. But obviously this could cause (and has caused) conflicts.

To impart order to this issue, a “Gentleman’s Agreement” band plan was developed by an ARRL Ad Hoc committee with input from users of 160m. The recommended band plan is shown in Table 1. You are strongly encouraged to adhere to this plan. A little cooperation among fellow Amateurs can go a long way!

Freq (Mhz)	Mode
1.8–2.0	CW
1.8–1.81	Digital Modes
1.81	CW QRP
1.843–2.0	SSB, SSTV & other wideband modes
1.91	SSB QRP
1.995–2.0	Experimental
1.999 – 2.0	Beacons

An Introduction to Operating on 160M (cont)

With the band plan outlined, a couple comments on where ëcommoní activities take place is in order. Rag chewing on 160m starts around 1.843 MHz and extends all the way up to 2.0 MHz. There's a lot of spectrum above 1.9 MHz that is relatively lightly used, so you might want to consider moving up there for your rag chewing activities. AM aficionados hang out around 1.885 MHz, and it's an enjoyable side hobby to fix up old radios and put them on the air (I can vouch for this through my efforts with my Viking Ranger II and Drake 2B with a homebrew converter). Finally, most DXing on 160m outside of contests is done on CW in the lower 35 KHz or so of the band. If you want to work DX on 160m, knowing code is almost a must due to CW's inherent weak signal advantage over SSB and the CW bandwidth letting in less noise (more on this latter aspect in a bit).

Since LSB (lower side band) is normally used on 160m, note that 1.843 MHz refers to the carrier frequency for LSB. The intent here is to keep the side bands at 1.840 MHz and above (since the bandwidth of an SSB signal is about 3 KHz). And there is no segmentation by license class ñ General, Advanced, and Extra class licenses have equal access to the entire band.

When is 160M Good?

Now that we know where we should operate in the 160m band, the next issue to address is when should we operate ñ that is, when is 160m good?

If your interest is only for local QSOs (rag chewing, nets, etc), then 160m is good anytime ñ day or night, summer or winter. And where we are in a solar cycle won't matter, either.

If your interest in 160m is DXing, then there are times, seasons, and phases of a sunspot cycle when 160m is best. Due to excessive daytime D region absorption, 160m is useful for DXing when the path is in darkness or very near darkness. Because of geomagnetic field activity considerations, 160m is best during the winter months and from solar minimum to a couple years thereafter. The latter portion of the previous sentence says now is the time to get on 160m if youíre pursuing DXCC or WAZ.

An Introduction to Operating on 160M (cont)

The solar minimum between Cycle 24 and 25 should offer excellent opportunities for the DX minded.

Simple Transmitting Antennas

As stated in the introduction to this article, the first biggest challenge for operating on 160m is the physical size of an efficient transmitting antenna. The length of a half wavelength dipole at 1.85 MHz is approximately 253 feet (each side would be about 127 feet). That's quite a bit of a horizontal span for those on small lots.

An easy way to overcome this horizontal span requirement is to make the dipole into an inverted-vee. For example, the top of a 50 foot tower or 50 foot support could be used as the center point for the inverted-vee. The sloping portion of each side of the inverted-vee could be approximately 70 feet, with the remaining 57 feet running horizontal to the ground and even snaked around a bit to fit the lot. Figure 1 shows this configuration. This would make an excellent antenna for local activity on 160m (but don't be surprised if you work DX with it—the ionosphere can be the great equalizer among different stations).

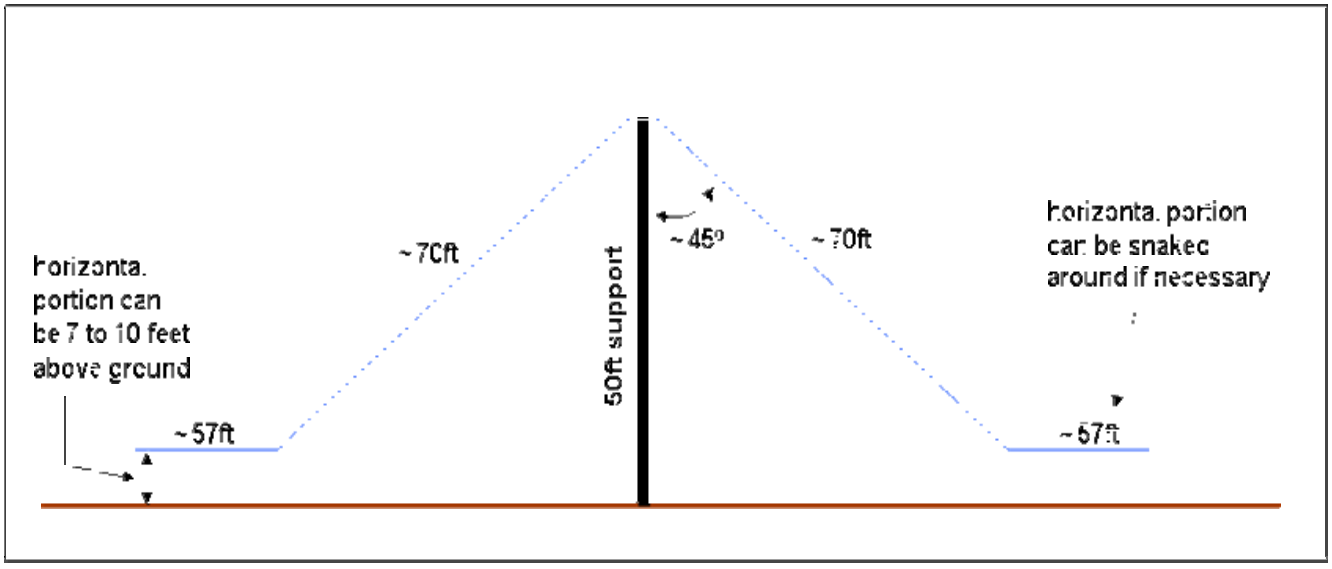


Fig. 1—Inverted Vee Installation

An Introduction to Operating on 160M (cont)

If your interest is DXing, generally you'll want an antenna that puts more of its energy at the lower elevation angles. Perhaps the simplest antenna to fit this bill is the inverted-L. The total radiator length needed would only be about 127 feet, as this is essentially a vertical antenna operated against ground. A tree could be used to support the vertical portion of the inverted-L, with the remaining length (127 feet minus the vertical portion) sloping down to a convenient support. Figure 2 shows this configuration using a tree for the support. Either buried radials, radials lying on the ground, or elevated radials could be used to provide the ground image for this antenna.

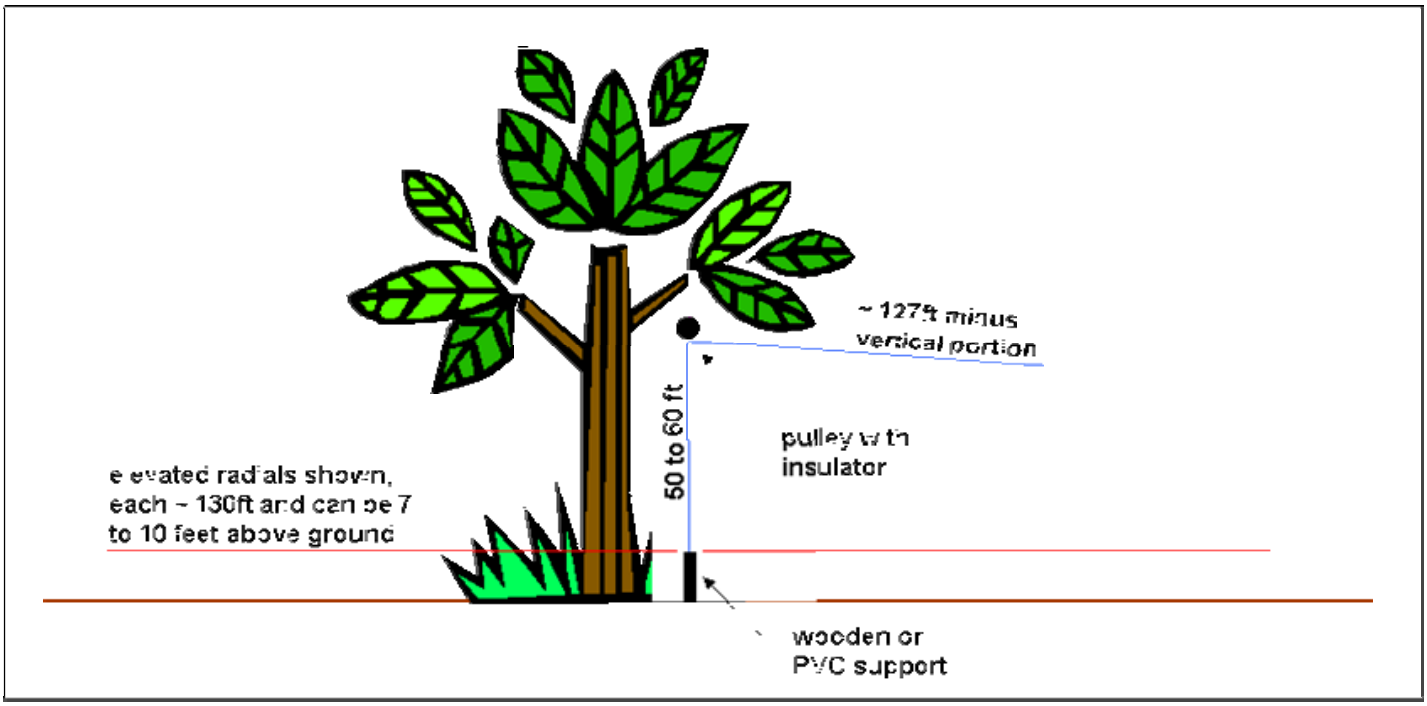


Fig. 2—Inverted-L Installation

Noise

The second biggest challenge noted in the opening paragraph (mostly affecting those interested in DXing) is noise and is noise and its impact on the ability to hear weak signals. There are two sources of noise that make receiving on 160m difficult: man-made noise (machinery, appliances, lights, and so forth) and atmospheric noise (static from lightning discharges propagating into your QTH).

An Introduction to Operating on 160M (cont)

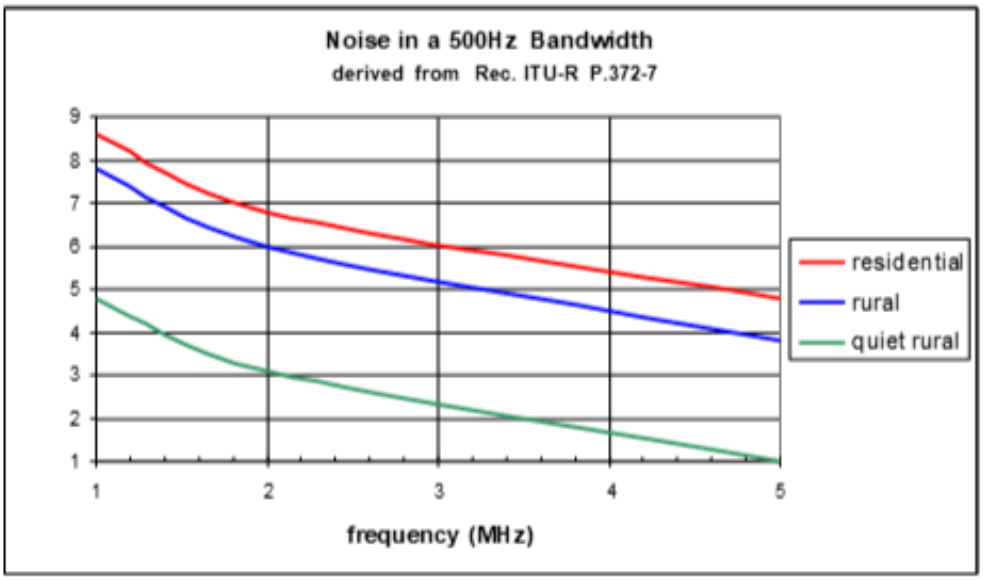


Fig. 3—Expected Noise Levels

Figure 3 shows the magnitude of the noise problem (from data in the International Telecommunications Union document Rec. ITU-R P.372-7).

The three curves in Figure 3 are the expected noise from a short monopole antenna in a CW bandwidth (500Hz) in terms of S-units for three noise environments: residential, rural, and quiet rural. This plot should be used as a ballpark guideline, as your mileage may vary according to your specific local conditions. I would expect the noise received by the inverted-L in Figure 2 to roughly agree with the short monopole data in Figure 3, with the inverted-vee of Figure 1 maybe a bit better due to some directivity (see the next section). For the data in Figure 3, I assumed S9 was -73 dBm (50 microvolts) and an S- unit was 5 dB (based on my measurements, this is typical of current receivers).

In a residential area, the expected noise on 160m in a CW bandwidth is around S7. Wow! Even moving to a rural area only knocks this down to S6. Heading out into the country puts the noise at S3. That S3 value is the level of noise in a CW bandwidth on my OMNI VI Plus using my inverted-L.

The S3 value doesn't sound like much, but remember that the noise floor of a modern receiver is around -130 dBm. Using a signal generator, the S3 value on my OMNI VI translates to about -103 dBm. Thus I am giving up almost 30 dB of "hear-ability", which is the difference between my external noise level and my receiver's noise floor when using my inverted-L for receive.

An Introduction to Operating on 160M (cont)

Be aware that the data in Figure 3 assumes you donít have a particularly troublesome local man-made noise source that masks everything else (for example, a noisy utility line). If you do, then you have your work cut out to eliminate it. On a personal note, the most interesting noise source I've had to find and resolve was an electric blanket used by our neighbors to keep their cat warm.

Simple Receiving Antennas

When you first start out on 160m, you'll probably use your transmit antenna for receive. As you progress with your 160m activities, you may need to work weaker signals that are at or even below the noise level resulting from using your transmit antenna.

This is where low-noise receiving antennas come into play. Regardless of the category of the low-noise antenna, they all work on the same principle ñ increase the directivity of the antenna (make front-to-back and front-to-side ratios larger) to reduce the total amount of noise being received from around the compass. This assumes the arriving noise is not a localized source as mentioned in the previous section. And if there is a noise source in the direction you want to receive, you have a real problem.

The improvement in "hear-ability" for a given low-noise receiving antenna will generally follow the narrowness of the pattern ñ a narrower pattern will let less noise into your receiver and lower your noise level, and thus will thus allow you to hear closer to your receiver's noise floor. From this consideration, we can make a first-order list of how effective some of the common low-noise receiving antennas will be. In order of least effective to most effective, they are:

Antenna	Length
Short Beverage	**80M long**
Elongated Terminated Loops—EWE, Flag, K9AY	
Standard Beverage	**160M long**
4-Square	**1/4 Wavelength spacing**
Beverage	**300M long**

An Introduction to Operating on 160M (cont)

Remember that new layers of DX may be heard with noise reductions of as little as 3 dB. So don't rule out the antennas in the first two categories. Even though they are small, they will probably fit on almost any lot. And they might just make the difference for you in making a QSO.

If your only problem is that of a troublesome localized noise source mentioned earlier that defies elimination, consider using a small loop antenna to null out that direction.

Propagation and Predictions

If we look at worldwide electron densities, we'll see that the ionosphere always has enough ionization to refract 160m back to Earth for multi-hop propagation—even during the dead of night at solar minimum. Thus the problem on 160m is not with the MUF (maximum usable frequency) ñ it's with the amount of absorption and the resulting signal strength. This was the basic premise mentioned previously in the 'When Is 160m Good?' section. Due to absorption, the best place for 160m RF is in the dark ionosphere.

Now if you've used propagation predictions on our HF bands, you've probably noticed that most of them do not include 160m. There's a very good reason for this ñ it's because of the impact of the Earth's magnetic field on three basic propagation parameters. With 160m being so close to the electron gyro-frequency, the magnitude of the magnetic field and the direction of propagation with respect to the direction of the magnetic field modify the amount of absorption incurred, the amount of refraction incurred, and the polarization of the wave(s). This can get very complicated very quickly over long paths, and the proper way to address this rigorously is with full-blown ray tracing software.

Over the years there have been several studies by 160m enthusiasts to come up with a simple method to predict whether 160m is going to be good on a given night. These studies have usually been based on solar flux and K or A indices. These efforts have not met with much success, as they do not consider all the variables that appear to be involved with propagation on 160m ñ especially events that happen in the lower ionosphere to enable ducting mechanisms and reduce absorption.

An Introduction to Operating on 160M (cont)

In general a quiet geomagnetic field seems to be a requisite, but it doesn't appear to be the only requisite.

This all comes down to two simple pieces of advice with respect to propagation on 160m:

1. Use the excellent mapping feature in many of our propagation prediction programs to determine the best times for 160m propagation over the desired path with respect to darkness along the path. Pay

particular attention to sunrise and sunset times at your QTH and at the other end of the path for possible signal strength enhancements.

2. Get on the band to check it out in real-time. Watching Packet Cluster spots also helps to get a real-time assessment.

Aids for 160m Operating

The 160m Tips section lists several sources of information to learn more about 160m—from more effective transmitting antennas (better than those described earlier) to low-noise receiving antennas (like those mentioned earlier) to the intricacies of propagation on 160m to planned DXpeditions to general topics. If you have the desire to go deeper into any of theses areas, check out those references.

Summary

As mentioned several times in this article, 160m is also known as the Gentleman's Band. The current users of 160m would like it to stay that way. So regardless of your operating preference (rag chewer, DXer, contester, digital enthusiast, QRPer, or whatever) please strive to uphold the reputation of 160m.

The advice and solutions offered in this article probably wonít get you to the Top of the DXCC Honor Roll on 160m. But they will allow you to sample the challenge and adventure of 160m. Where you go from there is up to you.

An Introduction to Operating on 160M (cont)

160m Tips

The following is a list of tips, slanted toward the DX aspect of operation on 160mn, to help you enjoy your experience on 160m.

Station issues

Put out as much wire as possible for your transmit antenna Work with the utility company and/or neighbors to fix noise sources Further improve your ability to hear by using low-noise receive antennas

Operating issues

Listen, listen, listen. Don't call incessantly in a DX pile-up Be courteous and uphold the reputation of 160m as the Gentleman's Band

Propagation issues

Know when the desired path is in or very near darkness Pay particular attention to sunrise and sunset times. Don't shy away from elevated K indices ñ there may be skewed paths Check paths to the southwest at your sunrise and southeast at your sunset

Aids for 160m Operating

ON4UN’s Low-Band DXing by John Devoldere ON4UN (Fourth Edition, published by the ARRL)

This book is an excellent source of vast technical information for serious 160m aficionados. It covers propagation, transmitting antennas, receiving antennas, receiver performance, transmitter performance, and more. The ranking of the effectiveness of common low-noise receiving antennas in the text of the article came from the RDF values on page 7-97 of this book.
low band topics, with many informative technical discussions.

W8JI website

Tom Rauch W8JI maintains a website (www.w8ji.com) dedicated to many low band topics, with many informative technical discussions.

An Introduction to Operating on 160M (cont)

DXing on the Edge ñ The Thrill of 160 Meters by Jeff Briggs K1ZM (published by the ARRL)

This is an easy-read book with a chronology of 160m DXing from the 1930s to the present, many operator biographies and station descriptions, descriptions of simple antenna systems, and general operating information. It includes a CD with memorable moments on 160m.

The TopBand reflector

The TopBand reflector, moderated by Bill Tippett W4ZV, is an on-line source of 160m information. It includes help information, operating practices, early announcements of 160m DXpeditions, and technical discussions. You can subscribe to it by going to www.contesting.com, and then clicking on Other Lists on the left.

W8JI website

Tom Rauch W8JI maintains a website (www.w8ji.com) dedicated to many low band topics, with many informative technical discussions.

The Low Band Monitor

This is a monthly periodical edited and published by Steve Gecewicz K0CS (under the pen name Lance Johnson) devoted to 160m, 80m, and 40m operating. Several annual operating awards are offered to low band enthusiasts. For more information, visit www.lowbandmonitor.com.

Build Your Own Beverage

Do You Want to Hear better on the Lower HF Bands? Me Too! Improve your ears with this easy to make & use antenna.
by Dave Anderson, K4SV

Our goal as amateur radio operators is to build a station and continuously improve it as to make it as reliable as possible under any conditions. This is why we are always tweaking this and that. I have been a ham now for over 40 years getting licensed in 1974. I learn something every day in this great hobby. I just love antennas and I cannot seem to get enough of them. I discovered the Beverage antenna years ago. Nope, it is not a stack of beer cans but rather an easy to make and maintain antenna that you can build with materials available in your junk box or a quick trip to the Home Depot. You can read up on the inventor of the antenna Dr. Harold H. Beverage at http://www.qsl.net/aa3px/beverage.htm Take some time and read the two interviews with Dr. Beverage. After reading you can see how the thought process started and why.

My goal here is to tell you how to make one, or a bunch, of these wonderful antennas. I won't get into how they work; you can search the Internet and learn how they work. I will concentrate on the "How To" build one for yourself. I will tell you about what I did to make the antenna and how I did it. I have given this to my friends Joe, W8GEX; Bob, ND7J and Lynn, W4NL and all were successful in erecting multiple beverages and find they work great. Feel free to make improvements, but do not pine over the details, build it, and then improve it. So here we go.

A beverage antenna is essentially a long wire supported by some non-metallic supports strung in the direction of where you want to hear signals from. In my opinion this is a non-scientific antenna and can be built in many ways with similar performance. Some may disagree and say that it should be built only a certain way to be optimized to work correctly. I say OK, build it however you like, but I wager that a perfectly built beverage won't work any better that one less perfect in practice, says my experience.

Build Your Own Beverage (cont.)

So, let's find a place to put it. We all live in places that restrict our antennas and this antenna will challenge the best locations. Your goal is to point the antenna towards the part of the world you want to hear better. A beverage antenna is directional, but depending on length, the beam width will vary. Your first beverage should be about a wavelength long for your target band, plus or minus. Remember this antenna is non resonant on any frequency, like our transmit antennas are. You do not want it to be. This allows you to use it across many bands.

How long to make it? Bigger is better, but not in all cases. My friend Bill, W4ZV said it best, "Make it as long as your property allows then drop it to the ground and terminate it." Let's say you want it for 80 meters, then a wavelength is about 40 meters and practice says about 270 feet will do. If you're looking for 160 meters, I like 550 feet. Remember, being non resonant 1, 1.5 wavelengths are a good place to start. Making them loo long will narrow the beam width but maybe that is what you're looking for. Just because you make a beverage 270 feet long does not mean it will not work on 160 meters or 40 meters. For me, longer wire for lower frequencies hear better because it picks up more energy. Small loaded transmit antennas for lower frequency generally do not work well for the same reason. So, when it's all said and done, if you can make a wavelength long beverage for your band, do it, if you cannot, make it as long as you can, it will work well being a bit short.

The beverage antenna has a termination on the end that is pointed towards your target and the other end is the feed point. I believe that the optimum height above ground is between 3 and 4 feet. This can vary depending on many factors. As you run the wire it can change elevation if required to go over a walking path or other obstructions. It's OK to go higher for a short length, say over a driveway or path, then back down to the same height as before. Just try to stay between 3 and 4 feet the best you can. For safety, install regular old wire nuts every 50 feet or so in case something gets into your wire, the nut pops off freeing the wire.

Build Your Own Beverage (cont.)

The termination for the beverage should be a non-inductive resistor which means not wire wound. Find an old style 2-watt carbon composition, or you can use a newer 2-watt ceramic composition resistor of a value of 470 ohms. I suggest that you also install a Gas Tube surge arrestor across the resistor this prevents lighting EMP from taking out your antenna during the summer. House the resistor network in a used Pill Bottle as shown. Of course, you can use a fancy plastic box if you have some. Once painted, a pill bottle will last for years. Always drill a small weep hole in the bottom to allow condensation to escape. Use a 3-to-4-foot ground rod or piece of copper tubing from Home Depot. I favor buying an 8-foot 5/8-inch ground rod and cutting it in two, use one half for each end of the antenna. You will need to electronically attach a ground wire to the top of each rod. This connection serves where the beverage termination or feed transformer attaches. I use a piece of #14 wire stripped and soldered to the copper rod about two inches or so from the top end. The feed point end consists of a coupling transformer you make using a binocular ferrite core and a female F connector. Feed the antenna with RG6 flooded coax cable available from just about anywhere. Your local cable company is a good source, they always have remnant pieces left over. If you and your buddies are all making antennas buy a 1,000-foot roll of Comscope F660BEV or similar flooded RG6 off eBay from PHAT Satellite for 45 bucks. This is a cheap, direct burial, durable, low loss cable. Remember the feed point may be located a long way from the shack so you may need a few hundred feet. Do not worry about loss, this cable is rated for GHZ work. You will need a SNAP-N-Seal connector (BLUE color for RG6) also and compression tool. Use the other half of the 8-foot ground rod at the feed point. You can use 50- or 75-ohm coax or a combination in the feed line.

The antenna supports can be just about anything non-metallic. This includes, trees, bushes, wood fences or anything else non-metallic. If you’re planning to run the antenna across a field or wherever, you will need some supports. These can be made from white ½ inch Schedule 40 PVC pipe which comes in 10-foot sections.

Build Your Own Beverage (cont.)

If you do not want any waste, cut the PVC pipe to 3.33 feet and you get three pieces per 10-foot stick, but I recommend using 4-foot lengths. Buy a contractor size bag of the same size PVC "T" fittings to support the wire. Buy 2-foot lengths of ½ inch re-bar to support the PVC pipe, one per pipe support one foot in the ground. You will need to slot the top of the PVC "T" using a hacksaw or band saw. Be Careful! You need one support every 50 feet or so. If you decide to attach it to existing supports you should have a round staple gun and use insulated wire, stapled onto stuff as necessary.

Antenna wire can be any copper wire, thin, thick, solid, or stranded, insulated or bare. I recommend using between number 18 and 14 gauge stranded. Home Depot sells a 500-foot roll of #14 wire. Buy what color you like but I recommend white if you can, as this allows people and animals to see it. Buy some Yellow size wire nuts for all connections. Buy a bottle of NoaLox to treat all the connections, keeping them happy over the years. By the way, use this NoaLox on nuts, bolts, and electrical antenna connections outside in your antenna farm, its great stuff.

Building the Antenna

Once you have identified where you want the antenna feed point to be and where the termination is going to be it is time to run the antenna wire. Start by putting the roll of wire on a broomstick and support it on a ladder laying on its side. Secure the broomstick to the ladder so it can't move. Grab the wire and a compass or GPS and start walking in the direction of the beverage termination. This is the end you are pointing to where you want to hear. Walk and pull the wire behind you as it plays off the roll. Try to walk in as straight a line as you can weaving between obstacles but remember it does not have to be perfectly straight, it can vary side to side and up and down as necessary. Once you have reached the end of where you want the antenna, check behind you and see if the wire can be tweaked to straighten it up a bit.

Build Your Own Beverage (cont.)

The end of your walk is where the termination will be made, both physically and electronically. You will need an end support to tether the end of the antenna. You can use a tree, post or use the rod itself to provide the end tether by pounding it into the dirt at a 30-degree angle away from the feed point end of the wire. You will need a piece of rope tied around the rod, making a loop in the wire about a foot from the end. Tie the rope to the installed rod and to the loop in the wire, Now install the "pill bottle termination resistor network" using yellow wire nuts and be sure to put a little NoaLox in the wire nut before twisting it onto the wires.

Walk back toward the feed point along the wire that's laying on the ground and, at about 50 foot intervals pound a 2 foot piece of rebar 1 foot in the ground and slip a PVC pipe, with the "T" on top, over the rebar, and run the wire through the slot in the "T." If you're attaching the wire to trees or other support, start attaching the wire as you walk at the height you want. About every 100 feet, cut the wire, strip both ends ½ inch, twist the wires together and put a yellow wire nut with NoaLox in it to act as a safety break.

As you walk you can pull on the wire and see how it is supported, try to keep it around 4 foot high. It's OK to droop between supports, it won't affect it.

This shows the detail for the top "T" with the slot for the Beverage wire.

This shows the wire raised to go over a walk/driveway

Build Your Own Beverage (cont.)

When you arrive at the feed point drive in a ground rod at 30 degrees or attach it to another support using a bungee cord, make a loop in the wire and pull it till it's as taught as you like. The bungee will keep tension on the antenna. Drop the antenna wire and attach it to the feed point transformer and ground rod. At this point the antenna is installed and ready to be connected to the receiver.

Run the coax from the feed point to the shack through some lighting protector. Using the necessary adapters connect to the receiver. Your transceiver may or may not have a separate receive antenna connection. This antenna is for receiving only and cannot have RF power put into it. If your transceiver does not have a receive antenna port you may need to buy a device to allow for receiving antennas, such as a DX Engineering RTR-A1 receive antenna interface box.

Let's Listen

The Beverage antenna does not have gain, in fact it is something like minus 20 DB gain in signal level from a transmit antenna. Do not expect it to sound louder but instead it has directivity. This directivity helps get rid of noise and signals coming in from the side and back of the antenna. This increases the Signal to Noise ratio making the signals sound louder.

Some say the receive antennas should only increase the receiver noise floor when connected and that is all the gain you need. While this may be true, I found, through practice, from time to time a little gain helps so it's OK to use your internal preamp in the rig to boost the receive level. You are the best to judge, tweak the gain and see what sounds better.

Try this, tune your favorite section of 80 meters in the evening and make a mental note of what you can hear, then enable the receive antenna and listen again. You will hear signals you did not hear the first time. But remember this antenna is directional and if you want to listen in another direction, you will need additional antennas.

Build Your Own Beverage (cont.)

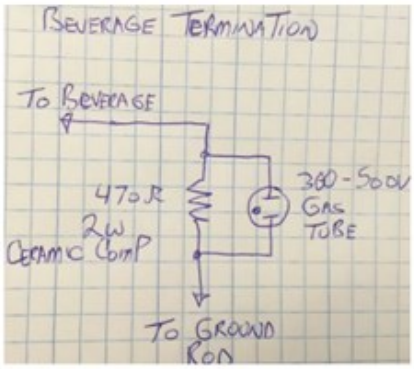
Here are three Beverages (in different directions) coming to a common feed point. A plastic "bucket" makes a weather-proof cover for the three Beverage feedpoint.

This shows the feedpoint for three Beverages at a single point, each one selected using a remote controlled relay.

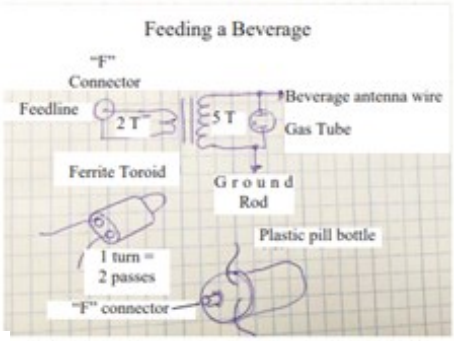
It's OK to cross receive antennas as long as they do not touch each other or run close to your transmit antenna. Be careful and avoid running by the transmit antenna if it is in the same physical polarity as the transmit antenna because it will induce a significant amount of RF into the receive antenna, not good. I have run mine by a vertical antenna with no issues.

Enjoy this amazing antenna and tell your friends. With all my friends who have installed this receive antenna, everyone has seen a huge improvement in receiving. As you know, before you worked everything you could hear on your transmit antenna. Now, you can work signals you could not hear!

See Y'all on the LOW Bands now that you can hear me.

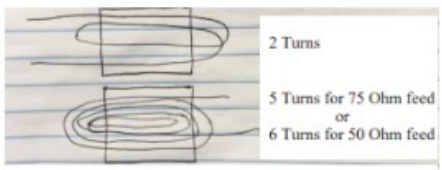


Above is the schematic for the termination end of the beverage. The picture shows one actually installed. Another "pill bottle" is used here. Note the wire nuts making the connections.



Note the "F" connector shown in the end of the pill bottle

Winding the Balun



Details for winding the Balun

Use #24 or 26 ENAMELED wire

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An Interesting Week on 160m

By Carl Luetzelschwab K9LA

A few years ago, a group of Germans went to Sudan, and they put STØRY on the air. I needed ST on 160m, and since they advertised a big low band effort, I did some advanced planning to improve my chance of adding a new one to my 160m DXCC total. Using W6ELProp, I noted that my sunset was at 2354 UTC (just before 7PM local time here in Ft Wayne) and ST sunrise was at 0400 UTC (11PM local) for the mid-date of their DXpedition. That means the short path would be in darkness for about four hours. More importantly, there was the possibility of an enhancement in signal strength around my sunset and around ST sunrise. Historical observations have generally shown that the enhancement at sunrise is the most likely one and the most pronounced one, so that's where I was going to concentrate my effort. I also planned on not jumping in on the first couple nights – I'd wait until the pileups were down a bit. That turned out to be a big mistake.

On the first two nights of their operation, I was in bed at 10PM adhering to my "wait a couple days" plan. On the second night around 10:30PM I was awakened by a phone call from Jean, the wife of John K9UWA. She relayed that STØRY was real loud on 160m, and that John, Gary KD9SV, and Jim KR9U just worked them (the other 160m aficionados in the Ft Wayne area), and I better get down to the radio pronto.

I quickly went downstairs, turned everything on, and sure enough STØRY was very Q5 at my QTH. I threw my call into the fray, but no luck. About 5 minutes later they were down in the noise, and I couldn't copy them. This is an excellent example of the old adage "you snooze, you lose."

This spurred me to listen in earnest every night thereafter at a little before my sunset (to catch any sunset enhancement on my end) and from 10PM on (to make sure I caught any sunrise enhancement on the ST end). I also kept an eye on Packet at all other times. They were there most every night as evidenced by the East Coast spots on Packet. But I couldn't hear them well enough to call.

An Interesting Week on 160m

Finally, on March 28, the sixth night after my "you snooze, you lose" episode, STØRY came well out of the noise at 0320 UTC and they were very Q5 until around 0340 UTC, when they faded back into the noise. That twenty-minute period was a great example of sunrise enhancement. But unfortunately, I came away empty-handed, as I couldn't get through the East Coast callers.

I kept checking every night afterwards until they ceased operating (which was four nights later), but their signal never came up as it did on the 28th. Was I disappointed that I didn't work them? Sure, but another old adage is "there's a silver lining in every dark cloud." On one of the nights when I was listening for STØRY, I caught 9L1BTB for a new one on 160m just as he was getting started on the band. With most everyone else calling STØRY, the 9L was very easy to work before the pileup got too big.

From my observations for this DXpedition, there were only two nights with a sunrise enhancement (the "you snooze, you lose" night and the night six days later). But this doesn't say there weren't any more. Perhaps there were enhancements of less magnitude every night – they just were not big enough for me to notice.

So, what causes a sunrise (or sunset) enhancement? One of the most plausible explanations is the occurrence of a more efficient mode. If we assume that conventional multi-hop propagation was occurring prior to sunrise approaching the ST end, then we'd expect absorption on every hop (along with ground reflection losses). As an example, a seven E hop mode (a reasonable assumption for this 11,000km path) would have in the neighborhood of 9dB of absorption per hop, for a total of 63dB of absorption. This would take its toll on the received signal strength.

As sunrise approaches the ST end, the dawn tilt in the ionosphere (because the nighttime ionosphere is higher than the daytime ionosphere) begins to come into the picture. What this could do is instigate a ducting mode – a mode that doesn't incur ground reflection losses or absorption on transits through the absorbing region. Figure 1 is a ray trace from Proplab Pro (Solar Terrestrial Dispatch) from STØRY to K9LA at 0330 UTC on March 28 (the

An Interesting Week on 160m

(the middle of my observed sunrise enhancement period noted previously) showing such a mode.

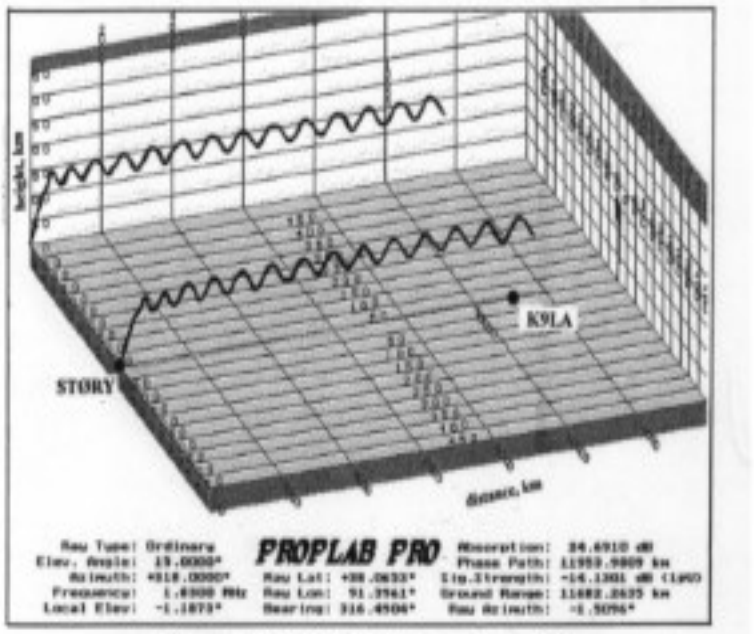

Figure 1 A Duct Mode from ST to W9

The premise is that the dawn tilt helped STØRY's RF get into the duct (by the way, there's a tilt at dusk, too). With only 25dB of absorption to get to K9LA (from the data in the lower right corner of Figure 1) and no ground reflection losses, the duct mode signal strength would be significantly greater than the aforementioned conventional multi-hop. mode. As sunrise got closer to ST, the tilt would disappear, and the duct would also go away. Note that the height scale in Figure 1 starts at 0km and is in 50km increments – I mention this as the actual height values are truncated in the Proplab Pro image. Is there a physical reason for a duct to occur? Yes, there is, and Figure 2 (also from Proplab Pro) shows the electron density profile along the STØRY to K9LA path at a point well away from sunrise.

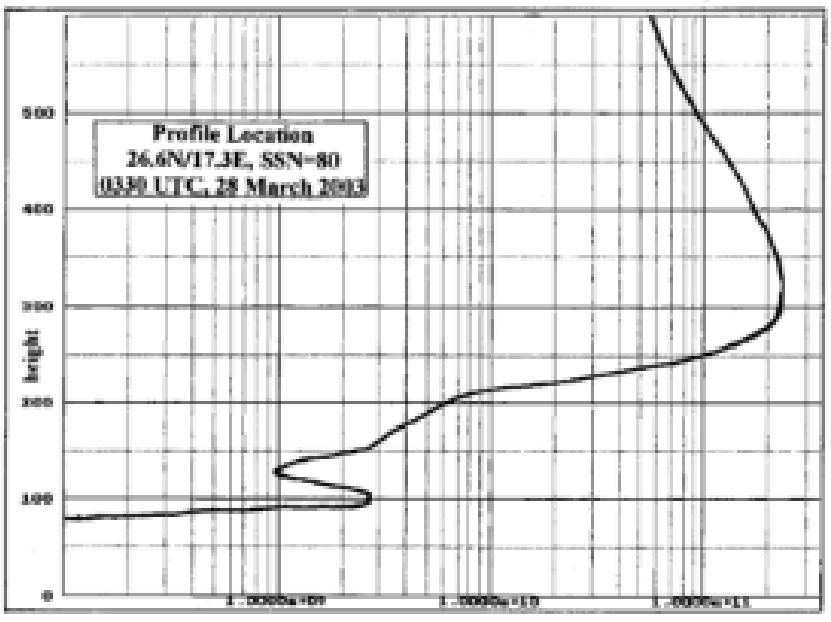

Figure 2 Electron Density Along the ST to W9 Path

We're looking along the path, and we're looking at the electron density versus height in km. Note the valley above the E region peak (the peak being at 100km). This is a typical profile in the dark ionosphere under quiet geomagnetic conditions.

An Interesting Week on 160m (cont.)

What this forms is a natural upper and lower boundary for successive refractions to occur. If you compare the apogee and perigee of the ray trace in Figure 1 (around 150km and 110km, respectively) to the electron density profile in Figure 2, you'll see that the ray is refracting between the topside of the E region and the higher F region.

Although a duct mode being the root cause of low band enhancements is an interesting hypothesis, it has its problems. One problem is seen in Figure 1: what brings the ray down into K9LA? Fortunately, this isn't too hard to answer. Our model of the ionosphere is a monthly median model, which means it's essentially an average of the ionosphere during the desired month. Thus, it doesn't show the daily variation of the ionosphere, and more importantly it doesn't show the irregularities that are known to exist in the ionosphere – even in the dark ionosphere when things are generally more stable. It could be that an irregularity in the electron density refracted the signal out of the duct. What helps here is that refraction is inversely proportional to the square of the frequency. Thus, of all our bands, 1.8MHz RF would be refracted the most from a given irregularity (gradient).

A more troubling problem deals with getting into the duct. Is the tilt the only way to get into a duct on 160m? Based on ray tracings with Proplab Pro along the ST to W9 path at 0200 UTC (well before sunrise at the ST end) and from many other previous ray tracings on other paths, the answer to that question is NO. Ducts can start in the dark ionosphere (the extent to which they occur appears to depend on magneto-ionic issues), so it's not real obvious why a duct instigated by approaching sunrise would be any better than a duct away from sunrise.

Please realize that this hypothesis is speculation. But it's interesting to think about it and try to match the physics of the ionosphere to observations, and vice versa. When we have a good match, we'll probably know the answer to sunrise (and sunset) enhancements on 160m.

Comments from our DX Friends

I sent out the challenge "Please summarize your 160M activities" to our DX friends. I received the following:

Hello Bill & Everyone,

The bible for me is the ON4UN book, almost all antennas in transmission and reception have been tested. Read it, it's great.

Here I use a very clear inverted L and I am very happy with it. When I have more time I will try a vertical antenna, friends who have this type of antenna always go before me on the DX. Hi. The band being very noisy, I have two beverages to listen to, one oriented to Africa (200m), the other reversible West / East (240 m). This is really necessary for good listening. In reception I tried other types of antenna but I always came back with a beverage. The 160M band is quite amazing and very interesting when you want DX but complicated DX to hunt. The 160M season is coming here in the northern hemisphere so good DX to all.

Ben—F8PDR

From Hans—OZ7BQ

A few words about the CQWW 160M CW test, which is a big challenge for me with only 100 m2 of garden available. And incidentally also only 100 Watts, for the sake of the neighbours. The 160M CW test is not an old-timer test, as most of the activity is after normal bedtime. Fortunately, this test starts already on Friday evening at 22 UTC, so I can still be around for a few hours.

Right from the start it went quickly. Lots of EU activity. In fact, I was able to do a few small runs before going to bed around 00 UTC.

I left the station on and on the night between Friday and Saturday I had the opportunity to run the tape over a couple of times. There was plenty of EU activity all the time, but not the W and VE stations I had expected to hear.

Comments from our DX Friends (cont.)

From Hans—OZ7BQ (cont.)

160M closes quickly after sunrise for me. The rest of the day you walk around with a feeling of jet lag. On Saturday evening the process repeated itself, but only on Sunday morning, a few hours before sunrise, did a handful of Were come through. All quite weak, but strong enough for me to read them. Sunday evening I was busy, so there was no activity here.
My antenna is an approximately 20m long inverted L antenna, with a tuning coil at the bottom. My noise floor is fairly constant around -90 to -95 dB, which should correspond to S5/6. No option for beverage antennas here.

The total result is: (CQWW 160M CW).
Score : 83,895
Hans Jørgen, OZ7BQ

From Stephan—OZ3SM

Of course I was again this year in this classic. A contest over 48 hours, where you as a single operator can participate for 30 hours. In this contest, it is a* good antenna with low radiation and power as well as a good location, *that allows for many QSOs in the box. Unfortunately, this is not possible for many amateurs.

It became quite clear to me in this contest, because in multi-band contests you can only change bands when the QSO rate is too small... not here. There is a limited number of participants who can hear and decode your little signal, and when you have driven them, there are simply no more to drive. Sigh, sigh.

In the first 10 hours (Saturday night + morning, Saturday evening) I made 594 QSOs. The last 3 hours (Sunday morning and evening) I got 76 in the box.

Comments from our DX Friends (cont.)

From Stephan—OZ3SM (cont.)

It got a bit boring, there was a long way between the called stations, everyone who could hear me I had already driven before!!!

As usual my antenna was my 80m vertical loop and K3/P3 with approx. 600 W.

I followed Søren, OZ0B on the cq-online server, who shoveled in DXCCs and States as multipliers and always approx. 150 QSOs more than me. Thanks for the QSO Søren - great result. Also thanks for the QSO to OZ1AAR, 7BQ, 8SW and OU2W.

The result claimed according to N1MM and approx. 13 hours in the saddle:

Contest: **CQ160CW**

>>>>> Score: 248,290

About the same result as last year, when 770 QSOs were required for the same score.

Vy 73 OZ3SM, Stephan

From S0ren—OZ0B/OZ1ISY

I definitely think that I had prepared well for this contest. The 240 meter Beverage antenna was set up on my good neighbor's corn field and it was tested ok. An inverted L antenna for TX stood nicely next to it. Titan PA stage was installed and tested. I had taken all of Friday off work, so there was no stress factor. Can you be more clear? I guess I just forgot to count Mr. Murphy with…..

Was woken up on Friday morning at 7.00 by my daughter who thought I was going to work. Well, now I was awake, so I went down to the radio room with a cup of coffee to check the conditions on 160m in the grayline. I call CQ DX to see my signals on the Reverse Beacon Network. Huh, it looks nice. There is a gap to the USA and before long K1ZM answers. Then I notice that the SWR is very high……. What the….. is going on?? Seriously man!

Comments from our DX Friends (cont.)

From S0ren—OZ0B/OZ1ISY (cont.)

I check everything and it all looks right. On with the SWR analyzer, which tells me that my antenna has resonance at 1680 Khz. Uh… What? I suddenly got a very long antenna. There is nothing else to do but put on the warm clothes and go out into the field to find the fault. Fortunately, the weather is fine and it would have been bad if I had stood there at 2300 on Friday evening with a headlamp on. think-think, what's the problem? Suddenly I realize what has happened. My L antenna is mounted on a 10.5 meter high aluminum mast and a simple measurement with the ohm meter reveals that the aluminum mast has made contact with the antenna wire. 10.5 meters up in the air unfortunately. So the mast must go down and lie down. It comes down and I quickly find the error. A simple task! It is quickly fixed and I take the opportunity to extend the mast by 3 metres. Now it is not so easy to travel alone so the wife and son have to help. Up it comes and then start adjusting the thread length and the large spool I use as a Hairpin Match.

Finally, SWR says 1:1.15 at 1830 Khz – absolutely perfect.

Time for lunch with the wife who has also taken a day off. Down in the radio room again and make the final preparations. Mattress on the floor, energy drink in the fridge, muesli bar and bananas within reach. N1MM is set up and all 3 PC monitors are prepared. Then I only need to note settings on the PA step down. After a 3-minute warm-up, we are ready. 1 Kilowatt (approx) into the dummy load and fine tune with Load and Tune. Hm, I think it seems a bit unstable? There is something teasing me… There is also something that smells burnt now…… Because s…. yes, the antenna plug on the output of the Titan is very hot and when I pull the cable, I can easily pull it out of the plug. Melted over. Cool. All my cables between radio, swrmeter, tuner, etc. are RG-58. They have held up well to my usual 400 Watt output. I estimated (naively) that it could also hold up to the greater effect, but it didn't work. Then I became so wise.

Short crisis meeting – what now? It was getting late and I wanted to eat dinner and sleep for a few hours before the contest started. Should I replace all connecting cables with RG-213?

Comments from our DX Friends (cont.)

From S0ren—OZ0B/OZ1ISY (cont.)

NO. Should I use my good old 400 Watt step? YES. 5 minutes later we were running again. Eat dinner and down on the mattress with 1 hour and 50 minutes to start. Poo-ha, sure one day.

Up and ready by 2200 UTC. The band is buzzing with activity and everyone is lying down and sending VVV so they can stick to their RUN frequency. Then the start goes and I start with S/P after Mult as I usually do in this test. The equipment runs as it should and it's great to get started. My only challenge is that I have to use a tuner when I go above 1845 Khz, as my antenna is a bit narrow-band. But it runs fine. At 2242 VO2AC smokes in the log and at 2308 N4XD. Yes, then there is a gap for NA. I run alternately RUN and S/P and there is an OK response. I feel that there are fewer participants than in previous years, but there is always something in the log. But no sweat on the forehead, unfortunately.

Thanks to a heavy intake of various energy-filled drinks and sweets, I keep going all night without any notable crises. Greyline is coming, but there are only a few single US stations, so no American-RUN this time. SF1Z closes and switches off at 0744 and then it's time for breakfast, bath and down on the mattress.

Sleep 5 hours and up lunch. Phew, feels like jet lag. The circadian rhythm is completely out of order. Spend the afternoon walking the dog and at 1530 there is activity on the strip again. My QSO rate is dropping sharply, even though I'm shooting at everything that moves. I take comfort in the fact that I can see from the Online score that even the big guns have low QSO numbers. I had a goal of getting well over 1000 Qsoer, but I can see that is unrealistic. The clock is passing 00:00 and there are far between QSOs, and I'm considering crawling into bed. Whoa - what was that? The dull sound of something sparking…. No, now it has to stop!! The sound comes from inside my manual tuner. Tool forward and off with the lid. Well, a small spark pops at regular intervals on my rotary switch. The bottom. So there is something about the 160m that draws larger currents. The tuner is taken out of service and then it must be low-power above 1845 Khz. Fortunately, there is not much activity there. Now it's like I've lost my mind. End for today. Down on the mattress. Good night. No more bother today.

Comments from our DX Friends (cont.)

From S0ren—OZ0B/OZ1ISY (cont.)

It helps the mood with a nap and I get up to the greyline. There is not much activity here, but it gives a few more states. The sun comes and then it's over. Sunday will be a dull affair. At 1400 I start the belt vacuum cleaner after the last points. I go on and off the radio a bit and there is also time for dinner with the family and a wonderful handball final.

N1MM says 20 "active" hours. The result is fairly satisfactory. Of course I will come again next year. So it's a cool test and there's room for more OZers.

829 Qso
22 states + 6 districts
59 DXCC
397,677 Claimed points

73 to you OZ0B / OZ1ISY Søren

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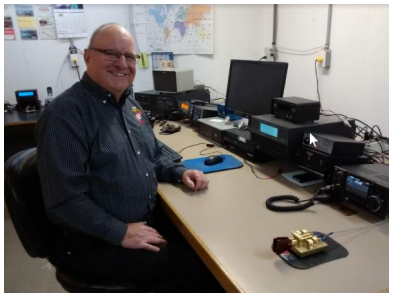

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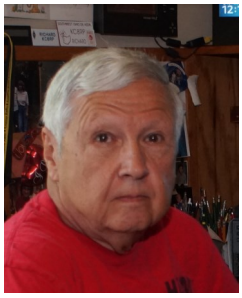

SWODXA Station
TrusteeW8EX

—

KC8RP—Richard Pestinger
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SouthWest Ohio DX Association (SWODXA)
Club Fact Sheet

Who We Are: *SWODXA* is comprised of active DX'ers and contesters with a deep passion for all aspects of Amateur Radio. We welcome everyone who is interested in joining our club to please contact us. *SWODXA* members are active in all facets of DX and Contesting. We also travel to, and fund various DXpeditions all over the world. *SWODXA* sponsors the annual DX Dinner held on the Friday evening of Hamvention weekend in Dayton, Ohio. In addition, *SWODXA* members moderate the Hamvention DX Forum and host the *W8DXCC DX Convention*. *SWODXA* is proud sponsor of the prestigious *DXPedition of the Year Award*.

DX Donation Policy: The policy supports major DXPeditions that meet our requirements for financial sponsorship. Details are available on the website at: https://www.swodxa.org/dxgrant-application/ and elsewhere in this newsletter

Club History: The Southwest Ohio DX Association (SWODXA) is one of the country's premier amateur radio clubs. Though loosely formed in mid-1977, the club had its first formal organizational meeting in August of 1981 where Frank Schwob, W8OK (sk), was elected our first President. While organized primarily as a DX club, SWODXA members are active in all aspects of our hobby.

Requirements for Membership: We welcome all hams who have an interest in DXing. It doesn't matter whether you're a newcomer, or an old-timer to DXing; everyone is welcome! Visit http://swodxa.org/member.htm

Meetings: The club meets on the second Thursday of each month at Hunter Pizzeria in Franklin, OH, and virtually via ZOOM. Members gather early in the private room for dinner and then a short business agenda at 6:30 PM, followed by a program. If you enjoy a night out on the town with friends, you'll enjoy this get together. Meeting attendance is NOT a requirement for membership.

Club Officers: Four presiding officers and the past president (or past VP) make up the Board of Directors The current roster of officers are: Past President Tom Inglin, NR8Z, President Bill Salyers, AJ8B; Vice President Kevin Jones, W8KJ; Secretary Mindi Jones, KC8CKW, and Treasurer Mike Suhar, W8RKO.

Website: We maintain websites at www.swodxa.org and www.swodxaevents.org managed by Bill, AJ8B. These sites provide information about a variety of subjects related to the club and DXing.

SouthWest Ohio DX Association (SWODXA)
DX Donation Policy

The mission of SWODXA is to support DXing and major DXpeditions by providing funding. A funding request from the organizers of a planned DXPedition should be directed to the DX committee by filling out an online funding request.
(https://www.swodxa.org/dx-grant-application/)

The DX Grant committee will determine how well the DXPedition plans meet key considerations (see below). If the DX Grant committee recommends supporting the DXPedition in question, a recommended funding amount is determined based on the criteria below. The chairman of the committee will make a recommendation at the general meeting on the donation.

Factors Affecting a DXPedition Funding Request Approval

DXPedition destination	Website with logos of club sponsors
Ranking on the Clublog Most Wanted Survey	QSLs with logos of club sponsors
Online logs and pilot stations	Logistics and transportation costs
Number of operators and their credentials	Number of stations on the air
LoTW log submissions	Bands, modes and duration of operation

H40GC	H44GC	ZL9HR	XX9D	HK0NA	FT4TA
KH1/KH7Z	EP2A	FT5ZM	C21GC	VK9WA	NH8S
K4M	CY9C	VK9MA	PT0S	FT4JA	YJ0X
6O6O	VP6D	TO4E	XR0ZR	VP8STI	VP8SGI
W1AW/KH8	K1N	3D2C	VK0EK	S21ZBB	E30FB
ST0RY	TI9/3Z9DX	VK9MT	K5P	9U4M	TX3X
VU7AB	3Y0Z	3C0L	TX7EU	CE0Z	3C1L
TI9A	3D2CR	3B7A	K9W	VU7RI	6O7O
C21WW	CE0Z	T30GC	T30L	D68CCC	W8KKF/WP5
K5D	3Y0J	T33A	3Y0J	CY9C	