



MURRAY STATE UNIVERSITY AMATEUR RADIO CLUB



MSU ARC Meeting – January 4th, 2022

Meeting was called to order by President, Tracy McKinney, W4IRT, at 7:00 p.m.

Roll Call & Question of the Night: Roll call was done and the question of the night was “Did you receive any HAM related Christmas gifts?”

Program: Bill Call, KJ4W, presented an informative program on “*Feedlines and You.*”

- Bill explained the different commonly used transmission lines for amateur radio operations. He reviewed the differences between coaxial cables (single shielded, double shielded, rigid hardline, and semi-flexible hardline) and parallel-conductor lines (300-ohm twin-lead, 600-ohm ladder line, and 450-ohm window line). He showed an example of how you model the different types of transmission line with a series of inductors and capacitors.
 - And he shared the formula of line impedance as:
 - Line $Z = \sqrt{L/C}$ where L is H per meter and C is F per meter.
- Bill conducted a “thought experiment” asking members to consider what happens when the switch is closed.
 - The capacitors and inductors have to “charge”. This means that there is current flow as well as delay. Since from Ohm’s Law R or $Z = E/I$, this means that our transmission line looks like a resistance, or impedance. We call that the “characteristic impedance” or “surge impedance” of a line.
- Bill then explained the geometry of the coax cable. He reviewed the different aspects of a coax cable including: the center conductor, outer conductor, types of dielectrics, inner diameter, and outer diameter.
 - He shared the impedance formula as:
 - $Z = 138 \log D/d$ (for air dielectric; would be lower for other dielectrics).
- Bill gave a little bit of history of why 50 Ohm is so popular. Going back to when HAM radio re-booted after World War II, 50 Ω was selected based on available types and sizes of materials to give good performance for both power and loss.
- Bill explained the “Skin Effect” as the reference to an increase in wire resistance at high AC frequencies, due to the electrons being forced towards the conductor surface due to magnetic effects. If DC current is passed in a conductor, the current is uniformly distributed and there is no “skin effect.” But resistance increases with an increase in frequency.
- Bill went over a couple of “trivia” questions:
 - What is meant by “RG”? – It is a military designation meaning “Radio Grade”; designating cables as suitable for use at high frequencies, i.e., Radio frequencies.
 - What is a “Velocity Factor”? – Signals travel slower through a cable with a dielectric other than vacuum or air. How much slower, as a percentage, is the velocity factor. Typical values are 66% to 85%.



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Program: “*Feedlines and You.*” (cont.)

- More feedline “trivia”
 - The most common coax used for amateur applications is RG8/U – a 50 Ω cable approximately 0.4 inch in diameter, with a solid or foamed polyethylene center insulation, and capable of handling full legal power. A close second is the RG213/U, a very similar 50 Ω cable.
 - Many amateurs are unaware that RG-8/U is an obsolete military specification designation. RG-213/U, on the other hand, is a current military designation that can only be used for cables manufactured to the military specification for that cable, both for materials as well as manufacturing processes. This results in a more consistent product.
 - It is also common for manufacturers to add the word “type” after military specification label, such as “RG-8 Type” or “RG-213 Type”. This means that the cable has much of the same performance characteristics as the “non-type” cable but is not guaranteed to meet those specifications.
 - Should you decide to use RG-8/U or a “type” cable, read the specifications carefully. The shield coverage (the percentage of the center insulator covered by the copper braid shield) should be from 95 to 97% for a high-quality cable. You should not be able to easily see the center insulation through holes in the shield.
 - Another advantage of RG-213/U is that the jacket is made from non-contaminating PVC, and many types of RG-213/U are rated for direct burial.
- Bill went over different loss factors in feedlines. Eventually over time, cable deteriorates due to exposure to moisture, sun, weather, critters, etc. and will need to be replaced.
 - Resistance Loss – is made worse at higher frequencies because of “Skin Effect.”
 - Dielectric Loss – is due to absorption of electrical energy by the insulating material of the cable. It typically increases with frequency.
 - Radiation Loss – is “leakage” of RF from the cable. Wide-spaced parallel lines, and coaxial cable with insufficient shielding have more leakage. It also increases with frequency.
 - Mismatch Loss – is additional loss to line-load impedance mismatch (high SWR).
- Bill then went over several different types of cables and passed around examples for everyone to see.
- He posed the question of “how much loss can you tolerate?” and truly it depends on your individual set up and what you can afford.
- Bob Atkinson, K9OIM, asked what the difference is between LMR400 and 9913 and Bill explained the basic differences between the two types.



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Secretary's Report: Josh Kerr, WV4O, moved to accept the minutes from last meeting; motion was seconded by Chuck Williams, K4CHW. Motion approved.

Advisor Report: Jana Hackathorn, KN4MWE, reported that everything is good. She will work on the invoice for the club to get paid for helping with the MSU basketball games, but needs everyone who volunteered to email her with the hours that they worked.

QSL Manager Report: Sue Reimer, NR4R, advised that there was nothing new to report tonight.

Treasurer's Report: Bill Call, KJ4W, reported that there were two deposits made since the last meeting: \$50 was deposited in November and \$154 deposited in December. There were several checks written: \$24.00 to the MSU Post Office for box rental, \$7.00 to W5YI-VEC Fees on November 2nd, \$35.00 to SERA for membership dues, and \$77.00 to W5YI-VEC fees on December 16th. The current bank balance is \$3581.42 and we are ready to begin collecting 2022 membership dues. Bill states he has already collected dues for 18 members and no one will be delinquent until April 2022.

System's Report: Bill Call, KJ4W, reports that the only work that he remembers doing over the past 2 months is to restart the computer on the EchoLink/Winlink/443.800 repeater. The 3 repeaters, the 2 APRS digipeaters and the 2m Winlink system are all working well.

VE Report: Bill Call, KJ4W, reports that an exam session was conducted after the November meeting. Patricia Board passed her Tech exam and was issued KO4ULZ. Our Fall license class concluded on December 16th with the following new Technician Class HAMS: KO4VLS - Robin Bracken, Hazel KY; KO4VLT - Stan Huber, Henry TN; KO4VLU - Robert Noack, Watertown TN; KO4VLV - Will Rudy, Hickman KY; KO4VLW - Edward "Ted" Spingler, Watertown TN; KO4VLZ - Marc Huddleston, Lebanon TN; KO4VMA - Jackie "Dan" West, Murray KY. In addition, K1MWH Morgan Harrison, of Clarksville TN, upgraded to Extra Class. We can have an exam session tonight if anyone is interested, if enough examiners are present; we had a request for an upgrade exam but the gentleman did not make it to tonight's meeting.

CERT Report: Bill Call, KJ4W, advised that 5 CERT members participated in testing weather sirens on December 3rd, 2021. Two CERT members and one other HAM also provided support to Mayfield disaster relief; Tracy McKinney, W4IRT, has more to present on that topic.

- Bill Call, KJ4W, reports one other item to note: Judge Imes has named CERT member Richard Palmer KM4JZX as Calloway County EM Director to replace Bill. Congratulations to Rich, and hopefully Bill will be able to stay retired this time!



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Net Manager Report: Chuck Williams, K4CHW, presented the net reports as follows:

- *November 2021 Net Report:*
 - 5 sessions
 - 149 stations
 - 288 minutes
 - 715.2 operator hours.
- *December 2021 Net Report:*
 - 4 sessions
 - 97 stations
 - 214 minutes
 - 345.96 operator hours.
- *December 10th, 2021 SkyWarn Net Report:*
 - 2 Sessions
 - 47 stations
 - 71 minutes
 - 55.62 operator hours.
- *December 2021 Wellness Net Report:*
 - 2 Sessions
 - 56 stations
 - 71 minutes
 - 66.26 operator hours.

Special Events:

- Tracy McKinney, W4IRT, reminded of memorial services for silent key, Bill Husfield, K9MMW, will be held on January 10, 2022 at Collier Funeral Home in Benton, KY.
- KYPOTA – John Coyle, W4PJC, advised that KYPOTA will be held on August 13th, 2022. He also reported that the WA7BNM Contest website will publish the event information on their site. John advised that the club's K4MSU website has information on the installation of N1MM logging system if anyone is interested in learning how to use it before the KYPOTA event.



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Announcements:

- Tracy McKinney, W4IRT, thanked everyone who helped and participated in the Christmas Parade.
- Tracy McKinney, W4IRT, reported that 3 members of the club assisted in Mayfield/Graves County after the December 10th Tornado. CERT members Tracy McKinney, W4IRT; Josh Kerr, WV4O; and club member Carolyn Winchester, WD4IEC; helped with receiving and some distribution of supplies. Tracy and Josh both spoke of their experience of assisting after this disaster.
- Tracy McKinney, W4IRT, advised that the “Tower Monkeys” Bill Call, KJ4W, and Steven Dabbs, KN4IRN, also assisted after the December 10th Tornado. They took an antenna tower and helped install a higher temporary antenna for the Marshall County first responders who were surveying storm damage.
- Tracy McKinney, W4IRT, congratulated Steven Dabbs, KN4IRN, for being voted 2021 HAM of the Year.

Old Business:

- **10 Meter Filter, Cable Bridges, Cable Spools** – Tracy McKinney, W4IRT, reported that the purchase of these items for Field Day 2022 is still on agenda, but it can be addressed at a later time.

New Business:

- Tracy McKinney, W4IRT, announced that there will be a SkyWarn Class on February 15th 2022 at 6p.m.
- Tracy McKinney, W4IRT, announced that Bill Call, KJ4W, is still working on the details of the General License course. We have the room reserved for the class but are waiting to see if the Covid case numbers start to decrease some.

New Members: Corbie Gomez, KO4ARX reported that two new member applications were submitted. Bill Call, KJ4W, motioned to approve the new members, Josh Kerr, WV4O, and Chuck Williams, K4CHW, seconded the motion. The new members were approved unanimously: **Jack Ellis, K9JLE, and Robin Bracken, KO4VLS.**

There was no VE Session held tonight. John Coyle, W4PJC, moved to adjourn the meeting and motion was seconded by Josh Kerr, WV4O. Meeting adjourned at 8:40 p.m.



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Attendance: 50 people

Tracy McKinney, W4IRT

Bill Call, KJ4W

Brenda Call, WA4IJU

Corbie Gómez, KO4ARX

Josh Kerr, WV4O

Bob Atkinson, K9OIM

Helen Atkinson, no callsign

Stuart Naulty, KN4RGB

Robert Bracken, KJ4RJB

Robin Bracken, KO4VLS

John Coyle, W4PJC

Gary Cooper, KJ4EBQ

Todd Carr, W4TZX

Bob Aldrich, WD8OWA

Bill Barley, KO4TVH

George James, KY4GMJ

“Pepper” Sullivan, WF1RE

Jerry Holt, N1BLH - guest

Richard Holt, no callsign – guest

Don Edwards, K4MKY

Steve Adcock, KF4KNF

Ruben Fuentes, WB5WTF

Mike Wright, KI4WBH - guest

Taylor Wright, no callsign – guest

Jack Ellis, K9JLE

Jeff Robinson, KM4YCU

James Flood, KJ4TKL – *via ZOOM*

Ben Rudy, KO4LFZ – *via ZOOM*

Dale Barrett, WB7D – *via ZOOM*

Valerie Barrett, KG4OCJ – *via ZOOM*

Tom Radja, KO4HCL – *via ZOOM*

Chuck Williams, K4CHW – *via ZOOM*

Larry Call, KD6UNL– *via ZOOM*

Dan Reimer, N4ZY– *via ZOOM*

Sue Reimer, NR4R– *via ZOOM*

Denis Barton, WB8SKP– *via ZOOM*

Debbie Barton, W8IBT– *via ZOOM*

Greg Gordon, KX4VI– *via ZOOM*

Gary Bolton, K1DXI– *via ZOOM*

Patricia Board, KO4ULZ– *via ZOOM*

Steven Dabbs, KN4IRN – *via ZOOM*

Todd Hackathorn, W4GV – *via ZOOM*

Jana Hackathorn, KN4MWE – *via ZOOM*

Jon Rose, W1WD – *via ZOOM*

Diana Mishica, KN4IRU – *via ZOOM*

Candy Aldrich, KJ4OZU– *via ZOOM*

Mitchell Moss, KN4KYU – *via ZOOM*

Joe Thweatt, KO4ASK – *via ZOOM*

Kathy Thweatt, no callsign – *via ZOOM*

Rich Childress, no callsign – *via ZOOM*

Respectfully submitted,

Corbie Gómez, KO4ARX, Secretary