KARS KEY KLICKS

JOURNAL OF THE KANKAKEE AREA RADIO SOCIETY

Volume 101 Issue 3

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March 2026

MLA (Magnetic Loop Antennas) Construction of 'A NEW DESIGN' – Part 1

The next KARS **General Meeting** will be held on Tuesday, March 10, at 7PM at the Bradley Bourbonnais Sportsmen's Club.

The March program, presented by Ken W9IE, is titled "MLA (Magnetic Loop Antennas) Construction of 'A NEW DESIGN' – Part 1."

In Ken's words, "after reading a QEX article by Tak Asami (W6SI) on the ARRL website, I decided to build a variation of this design. This presentation will provide detailed information on why and how MLAs work, along with documentation regarding the construction process and the challenges encountered. My prototype will also be available for observation.

If you have ever considered building a Magnetic Loop Antenna, I hope this session provides helpful insights.

Part 2 of this series will be presented at a later date and will focus on the antenna's operation."

A brief business meeting will follow the presentation.

Hope to see you there!

HAPPY BIRTHDAY

March 2	N9DLD
March 2	W9IEY
March 4	N9DWE
March 6	KC9VDI
March 11	KC9ZKA
March 14	KC9OAK
March 18	WA9CGZ
March 23	N9HJR
March 24	K9BYT

Let us know if your birthday is missed or listed in error.

KARS BOARD MEETING

March Board Meeting
Tuesday, March 24th
at El Mexicano's Restaurant
6PM to eat...7PM meeting
Everyone is welcome!

KARS KALENDAR

March 10.....KARS General Meeting
March 24.....KARS Board Meeting
April 14.....KARS General Meeting
April 28.....KARS Board Meeting

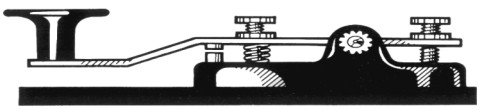
The Kankakee Area Radio Society operates repeaters on:

146.940 (–) PL 107.2Hz at 430'
444.800 (+) PL 100.0Hz at 300'
145.130 (–) PL 107.2Hz at 400'

Echo Link:
W9AZ-R Node 517002 on 146.940

Additionally, KARS sponsors Two Wide Area APRS digipeaters:
W9AZ-1 144.390 at 300'
W9AZ-2 144.390 at 440'

KARS DX Cluster w9az.ddns.net



W9AZ

KARS 2026 DUES SCHEDULE

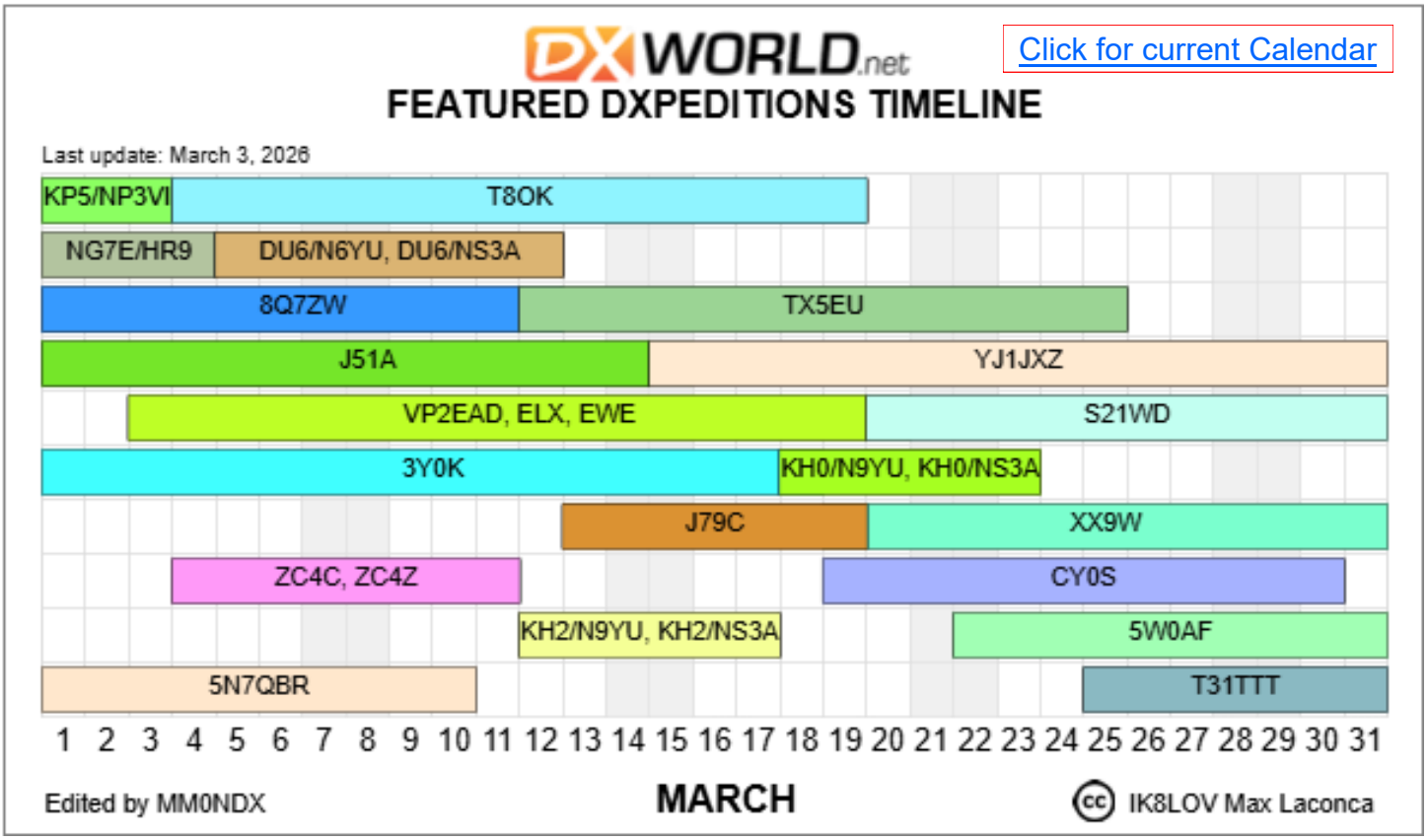
Regular Membership	$30
Family Membership	$40
Senior Membership	$15
Senior Family Membership	$20
Full Time Student Membership	$15
Disabled Membership	$15
Active Military	Waived

KARS KONTEST KALENDAR

Mar 1.....North Carolina QSO Party
Mar 7-8.....ARRL DX Contest SSB
Mar 14-15.....Idaho QSO Party
Mar 14-15.....Oklahoma QSO Party
Mar 15-16.....Wisconsin QSO Party
Mar 21-23.....BARTG RTTY Contest
Mar 21-22.....Virginia QSO Party
Mar 28-29.....CQWW WPX Contest SSB
April 4-5.....EARTTY Contest
April 4-5.....Mississippi QSO Party
April 4-5.....Louisiana QSO Party
April 11.....New Mexico QSO Party
April 11-12.....Missouri QSO Party
April 11-12.....Georgia QSO Party
April 11-12.....North Dakota QSO Party
April 19.....ARRL Rookie Roundup SSB
April 18.....Michigan QSO Party
April 18-19.....Ontario QSO Party
April 19.....Quebec QSO Party
April 25-26.....SP DX RTTY Contest
April 25-26.....Nebraska QSO Party
April 25-26.....Florida QSO Party

Clocks spring ahead Sunday, March 8 at 2 AM

KARS HOMEPAGE — WWW.W9AZ.COM — KARS HOMEPAGE



NCS FOR MARCH

The net meets every Monday at 2000 hours local time on the 146.34/.94 OR 145.130 backup repeater. All stations with or without traffic are invited to check in.

March 2nd	KD9NPQ
March 9th	KC9HDF
March 16th	N9OE
March 23rd	K9XI
March 30th	KD9NPQ

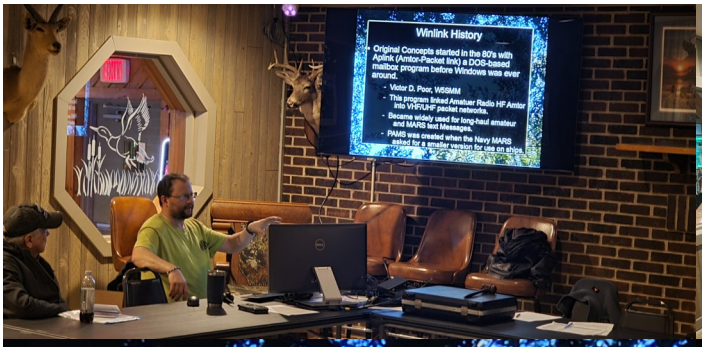
Member Information ~ New Call Signs

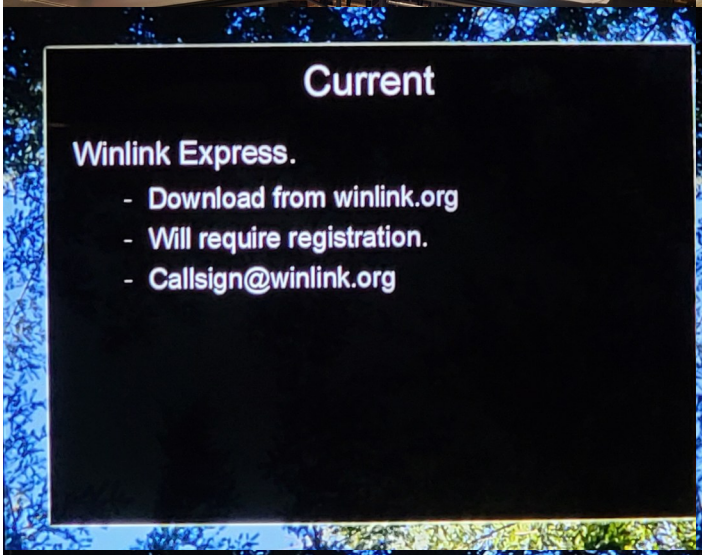
Don, previously KD9WJH, now K9ABZ

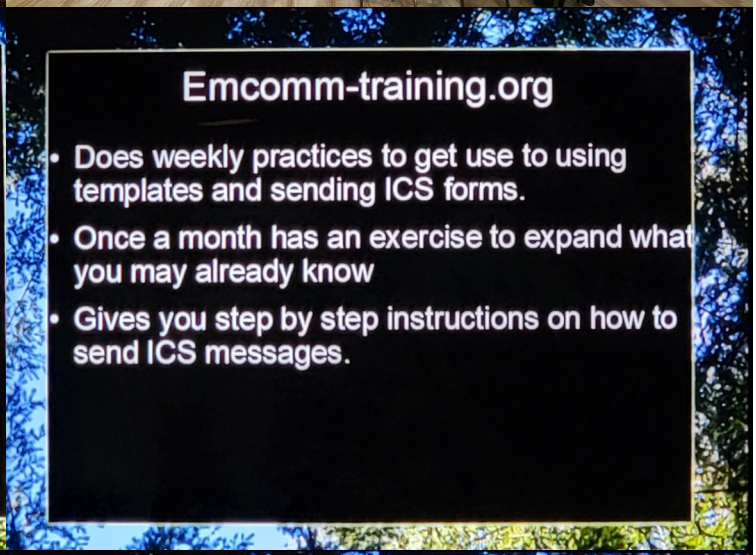
Brian, previously N9HJR, now W9NIM

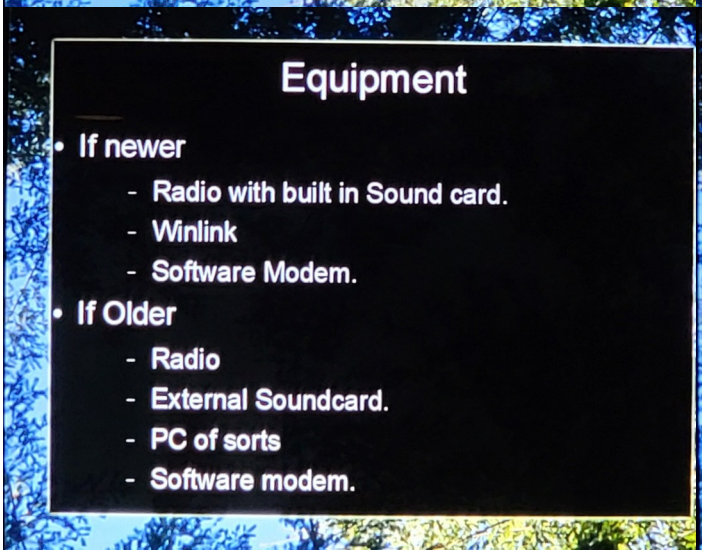
February program recap: Winlink and How You Can Use It

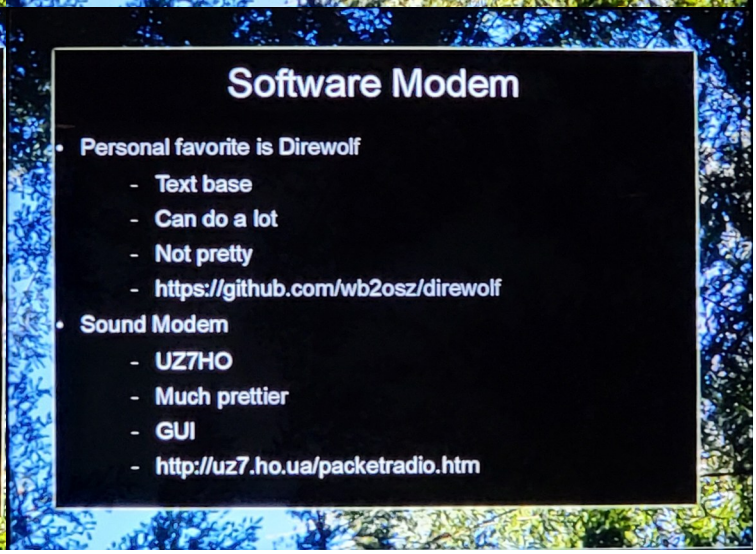
Thank you to Brian, KD9NPQ, for presenting an informative and practical program on Winlink and demonstrating how to use packet radio to connect to K9DHS's node in Aroma Park. Winlink is a worldwide radio email system that allows licensed amateur radio operators to send and receive messages via radio when internet service is unavailable or unreliable. It plays a critical role in emergency communications by providing a dependable method to pass formal messages, weather reports, and situational updates during disasters and public service events. Brian's overview of Winlink's capabilities, connection methods, and required software and hardware gave attendees a clear understanding of how this powerful system supports both everyday radio operations and emergency preparedness. Thank you, Brian!



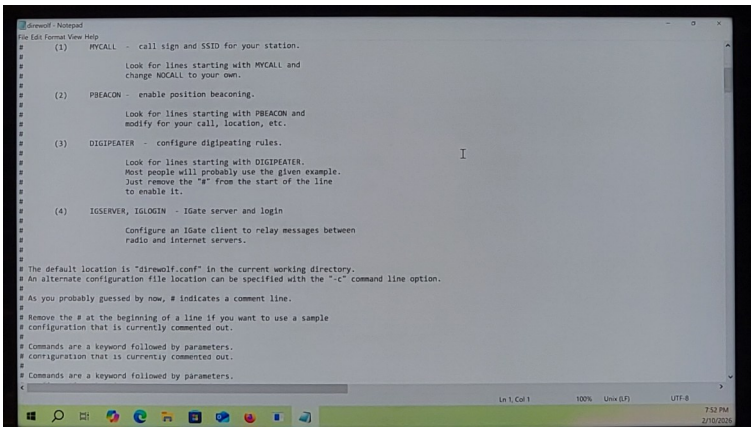


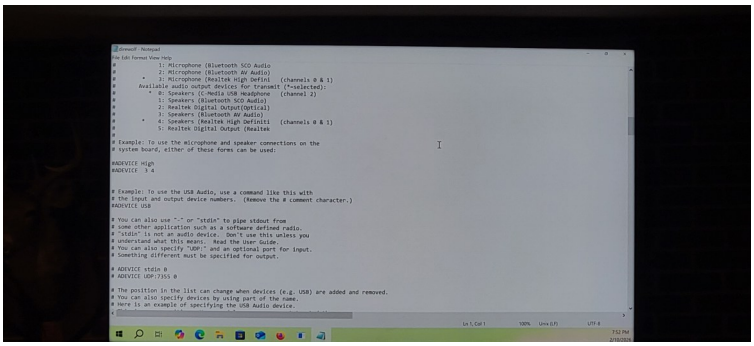


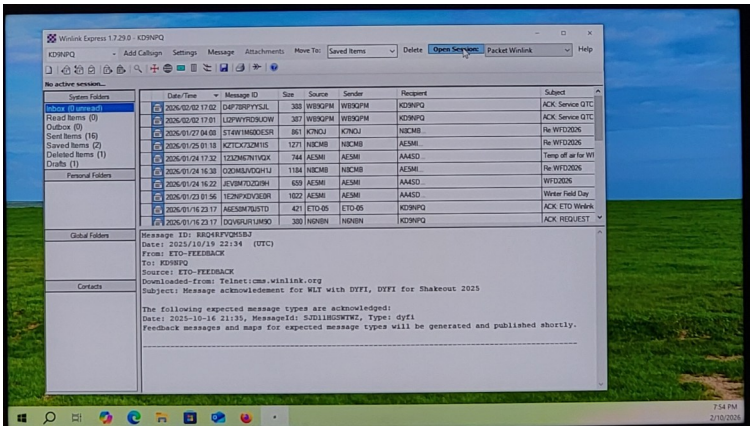




continued… February program recap: Winlink and How You Can Use It







KARS FOX HUNT INFO

IMPORTANT FOXHUNT ANNOUNCEMENT !

With colder weather and shorter days upon us, fox hunts are now finished for the season and will begin again in the spring when conditions improve.

On The Air & Around The Club

Please join us in welcoming our newest member, Connie, KE9EPX, to the KARS community!

We want to hear from YOU!

Share what you've been working on, any recent contacts or projects, and what's going on in your ham radio world. This could include:

- Recent station setups or mobile installations
- A picture of your ham shack
- Interesting contacts or DX experiences
- Ham radio events you're participating in

Don't be shy, let us know what you're up to!

Your Input Counts!

What program topics would you like to see at upcoming meetings?

Or is there information you'd like included in the newsletter?

Let us know- we want to make it relevant and fun for YOU!

ARES (Amateur Radio Emergency Service) NET

The regular ARES® statewide net is held on the first and third Sundays of each month at 4:30 PM local time on 3.905 MHz LSB. If needed, the alternate frequency will be 7.227 MHz LSB.

EMCOMM Net

Join us every Thursday night at 7:00 PM (that's 1900 hours for you EMCOMM folks!) on the 444.800 KARS repeater.

This net is designed to promote and practice solid emergency communications skills among amateur radio operators, as well as to verify proper repeater system operation. Everyone is invited to check in!

Follow us on Facebook at: https://www.facebook.com/KARSW9AZ

Have You Joined the KARS Email Reflector?

The **Kars_w9az Email Reflector** is a convenient way for members and friends of KARS to stay connected. It automatically distributes messages sent to a single address to everyone subscribed, making it easy to share announcements, ask questions, and keep up with club activities.

By using the reflector, all subscribers receive the same information at the same time, keeping communication simple, efficient, and centralized.

If you'd like to join, click the following link to subscribe to the **Kars_w9az Email Reflector**.

KARS Upcoming Events:

April: Annual Banquet (more information coming soon)

Repeater Talk from the bench of N9OE

Our Radio Club owns 4) Yaesu DR-2X repeater systems, 3) at different sites operating under different conditions, with each being controlled by an Arcom RC210 controller. The 4th system was purchased as a spare to swap into any of the other systems as needed. The spare lives in my basement where most of the time the power is disconnected until I need to do something with it such as program development, testing new programs, features or other system changes.

Several updates to the RC210 firmware have been released since I installed the new surface mounted microcontroller ICs in all the controllers along with firmware v7.651 in February 2021. As of Feb 2026, the latest firmware version was 8.08. I was procrastinating on upgrading to it, with concern of inadvertently introducing a new problem, which I had no time to address.

I decided it was time to get started, first with the spare repeater and controller we have. When I started them up for the first time in over 5 years, I noticed the controller COS light was on constantly. However, this was not causing the transmitter to key since our access mode is set up for Tone (CTCSS) & Carrier (COS). This COS issue was especially surprising since it didn't have this problem last time it was powered up, especially since the system was never connected to an outdoor antenna and the transmitter was always connected to a 50-ohm dummy load with the receiver connected to a 19" whip. Not understanding why I had the new problem, and while rushing to make quick progress, I chose to ignore it for now, hopeful that I had some kind of firmware bug that will be fixed when I upgraded to v8.08.

I proceeded with the procedure to upgrade the controller to v8.08. Once successful, it came back up with the default RC210 v8.08 program, announcing itself and new version. Unexpectedly, the system came up transmitting constantly, with a loud static noise of what sounded like FM open squelch. Writing our custom program to the controller seemed to fix the problem. I later realized, this must have been due to the stock program that comes with the new firmware was COS control only. Regrettably, I continued to ignore the COS LED that was still constantly Illuminated on PORT1.

Here's where it really started getting weird. The system seemed to be working fine until I tried to access any user macros or unlock the controller via DTMF codes. As soon as I sent a DTMF code and unkeyed, I noticed the Courtesy Tone disappeared. Also, the controller wasn't responding to any valid DTMF codes, despite the corresponding port DTMF LED responding correctly. I also noticed an "error" announcement when the program macros and IDs tried to call my DVR messages. Oddly, the Courtesy Tone wouldn't come back until I cycled power to the controller. Any attempt to send a DTMF code to the controller caused it to lose the CT.

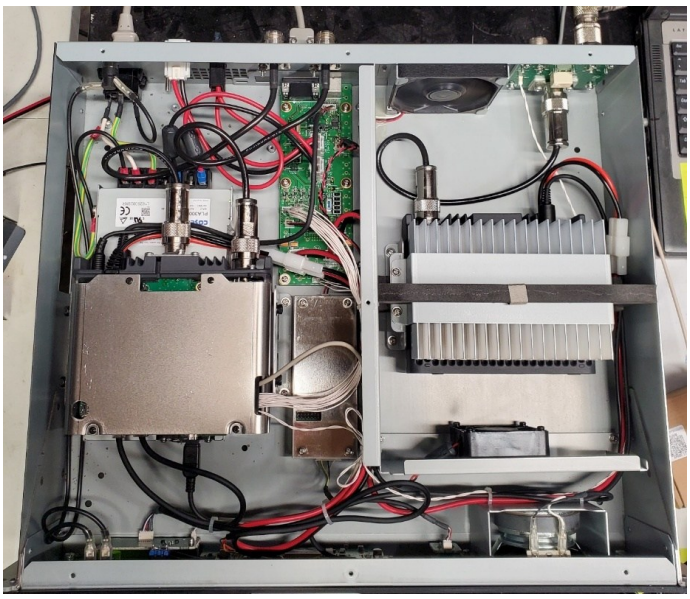
Another simple test was moving the repeater interconnection ADR cable to another port. This caused the COS LED problem to follow to that port. Thinking about the RC210 program, I wasn't sure how a constant COR LED could cause the problems I was having. Obviously, there were still some unknowns to explore.

Meanwhile, I sent an email to Ken Arck at Arcom Controllers and asked him for his input. While waiting for Ken to get back to me, I decided to research the constant-on COR LED problem. After a lot of dead ends, one of the results of a Google search led me to a post on the RC-210 groups.io page (https://groups.io/g/rc210/topic/104212807#msg46673). This clued me in that the Yaesu DR-2Xs may be having an issue with a COR line protection diode shorting the COR line to ground (which COR active low is the mode of operation for our system). In one of the posts on groups.io, I was surprised to learn that this problem happened to a Yaesu DR-2X user right out of the box!

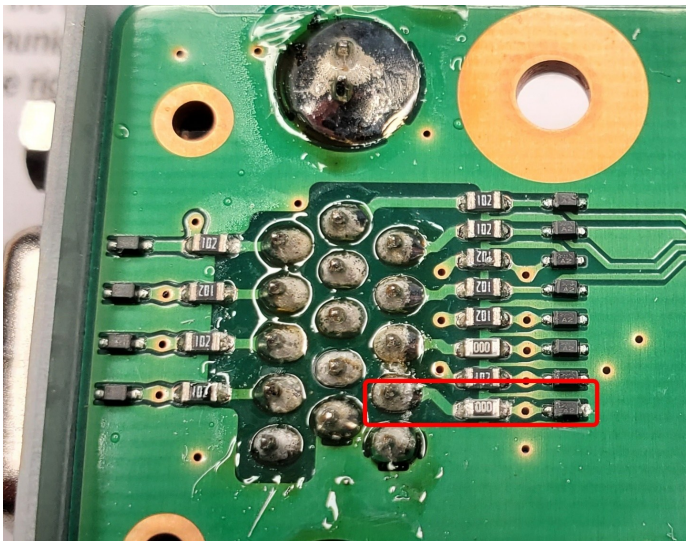
Without schematics or an idea where in the repeater this mystery diode was located, all I had to start with was the skills I gained from my experience as an electronics technician in my late teens through mid-20s.

I began troubleshooting the DR-2X COR circuit at the external Control I/O High Density 15 Pin (HD15) connector. Before I opened the repeater, I probed pin 4 of the HD15 Connector to ground reference, revealing there was a 3-ohm short to ground!

With the top cover off, it was interesting to find the repeater is just 2 mobile radios with the required control interfacing and fans for additional cooling.



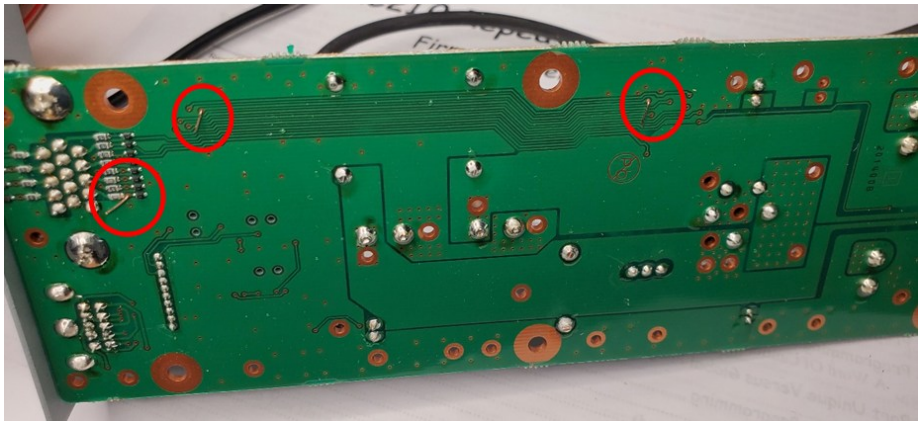
I proceeded to remove the external Control I/O board. Once on the bench, I traced the path of Pin 4 of the HD15 Connector to see everywhere it went. There is a 0-ohm chip resistor separating Pin 4 from the rest of the COR circuit. I confirmed the short was present on both sides of it and the protection diode shown below.



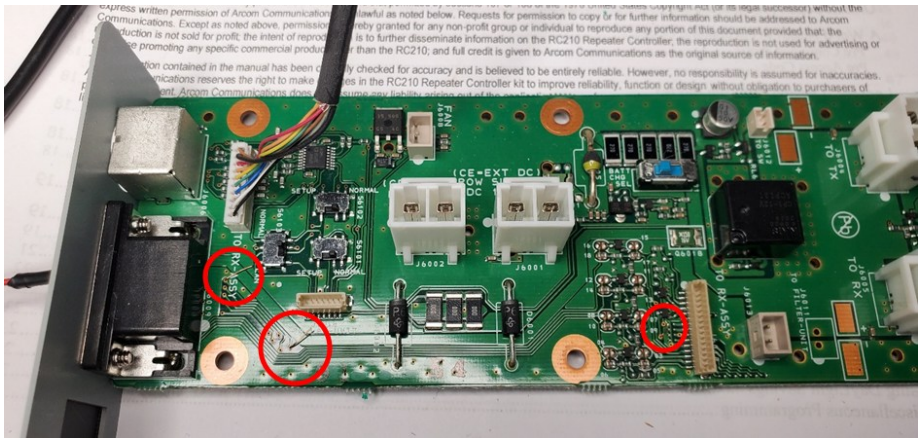
Looking inside the red box, the diode is black component to the right side and the zero ohm jumper resistor is in the middle. This is a VERY small surface mount device (SMD) diode, perhaps a BAV16W or 1N4148W or similar.

The red rectangle highlights the COR path near the HD-15 connector and passing to the other side of the board through the via through hole connection.

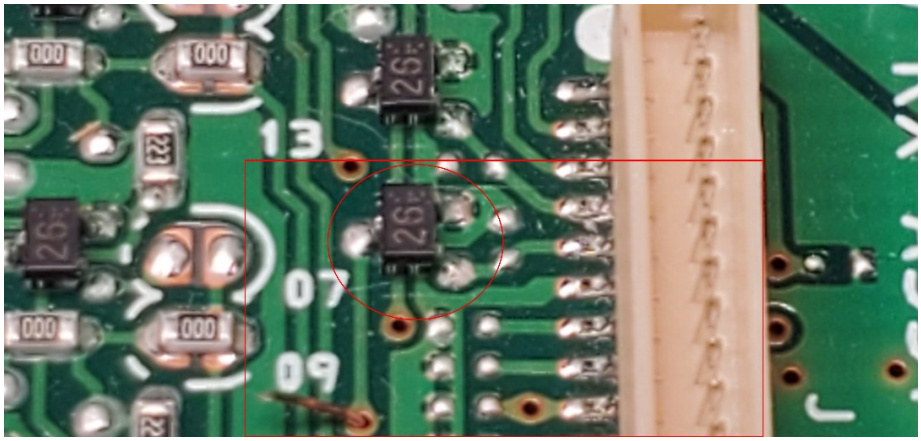
With all my experience as a bench tech in the 1990's through the 2000's, I don't trust the first part I find to be bad and proceeded to look at whatever else was connected to the trace or could have caused the failure. Also, with my eyes changing and near vision getting worse (I'm over 50 now), it was difficult to follow the tiny traces since they were routed on top and bottom of the board changing sides several times through vias. One trick I tried, was to pull a single strand of tiny AWG copper wire from some stranded wire and push it through the vias every time the circuit passed through. This was a big help to follow the circuit without going cross-eyed, tracing all the vias and parallel traces.



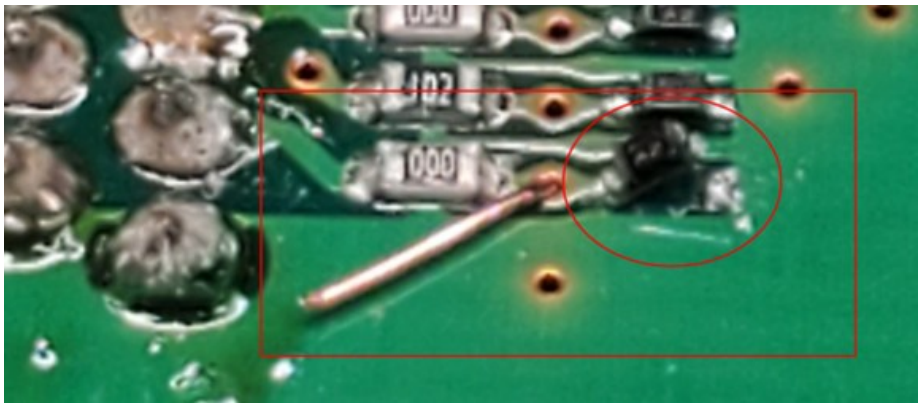
The red circles in the pictures on the left show how the vias pass the circuit above and below the board. Following through, this revealed the location of the open collector switching transistor.



This NPN SMD transistor controls the pull down (active low) logic of the COS line (circled on the left). I also checked for the short here and noticed it measured slightly higher value than where the diode was located. This told me to look back at the DB15HD end of the circuit for the problem.



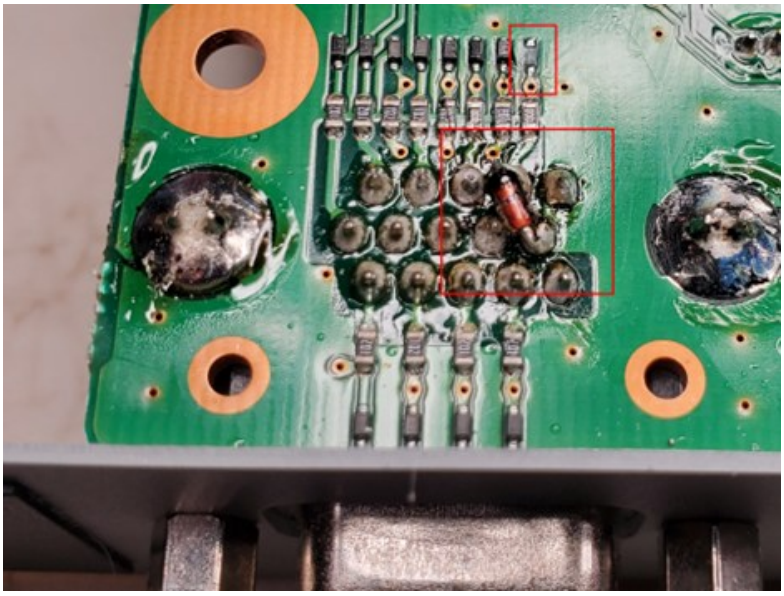
That discovery gave me the green light to proceed with pulling one end of the diode to test if the problem clears, assuming it was component failure.



Sure enough, retesting Pin 4 of the HD15 Connector to ground revealed the 3-ohm short disappeared!

I didn't have any BAV16W or 1N4148W SMD or equivalent diodes so tiny, so I had to figure out how to substitute a standard through hole 1N4148, despite its larger size.

I ended up removing the SMD diode and was thinking about soldering the new one to the original pads but there just wasn't enough space. I ended up soldering it to the connector instead, also by-passing the 0-ohm resister. This wasn't ideal, but it should be fine. I imagine the 0-ohm chip resistor is there to fuse for an overcurrent condition or a reverse polarity mis-wire, which would short the diode but shouldn't be a problem when connected to a preconfigured RC210 port.



Notice the absence of the SMD diode and the new 1N4148 soldered to the HD15 connector pins 3 and 4. There was plenty of clearance under the board since the standoffs were adequate.

Once the board was reinstalled into the DR-2X and connected to the RC-210, normal operation was restored! The COS light is functioning normally.

Now, I can resume getting this controller ready to swap into one of the sites for some much-needed maintenance and updating. Also, you should expect to hear some new AI generated voices helping with the announcements through the built in DVR.

73, Bill Dau, N9OE