Zero Retries 0120

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Steve Stroh N8GNJ, Kay Savetz K6KJN, Jonathan Naylor

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Zero Retries 0120

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2023-10-13 — MMDVM Project - Clarifications on MQTT, Pre-announcing the Book - Zero Retries Guide to Amateur Radio in the 21st Century, What's new at DLARC - October 2023

Zero Retries is an independent newsletter promoting technological innovation in Amateur Radio, and Amateur Radio as (literally) a license to experiment with and learn about radio technology. Now in its third year of publication, with 900+ subscribers.

About Zero Retries

Steve Stroh N8GNJ, Editor

Jack Stroh, Late Night Assistant Editor Emeritus

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- **Pre-announcing the Book - Zero Retries Guide to Amateur Radio in the 21st Century**

- **What's new at DLARC - October 2023**

Web version of this issue - https://www.zeroretries.org/p/zero-retries-0120

Request To Send

Editorial by Steve Stroh N8GNJ

To Achieve, *Focus!*

Other than maintaining the weekly cadence of publishing Zero Retries on schedule, to date in 2023 I haven't been very "productive" about Amateur Radio *activities*. Part of that is that Zero Retries has become far more successful than I imagined, which correspondingly required more of my time. Another activity was that I prioritized sorting out and packaging up (literally) hundreds of pounds of Amateur Radio printed material from N8GNJ labs to Digital Library of Amateur Radio & Communications (DLARC) for digitization and public access1. I've also had a few distractions in personal life, now mostly complete. Thus, I'm not beating up on myself.

Projects…

I appreciate the periodic nudges about getting active… *doing* Amateur Radio… from my friend Peter Dahl WA7FUS, especially about getting active again on some of the many Zero Retries Interesting radio systems I have been accumulating to experiment with in N8GNJ Labs. That list is too long, but a few that leap to mind are:

- The *big* project - see the lead story below.

- I still haven't executed on Neil's Night (1, 2, 3) concept other than having gathered a few bits of hardware.

- Getting the <u>Embarassment of ID-1s</u> on the air to at least talk to each other within N8GNJ Labs, especially now that Raspberry Pis are becoming more available.

- Getting my <u>New Packet Radio (NPR)</u> units on the air at least to talk to each other within N8GNJ Labs, and that's another project that requires Raspberry Pi units on each unit.

- Now that it will be soon be possible to build a <u>repeater for data modes</u> using <u>MMDVM units</u> with the MMDVM-TNC mode(s) (<u>1</u>, <u>2</u>) in development, I want to put together <u>my Bridgecom BCR-220 repeater</u> at least for bench testing, as well as testing it out in "Plain old FM" mode and try out VARA FM.

- I was reminded this week of my interest in a new radio system called <u>Halo TD-XPAH</u> that operates on the underutilized 902-928 MHz band. I backed that project (bought a pair of units) last year, but since I received the units, I haven't touched them.

- And of course, the long-deferred multiple antennas project, especially a long-deferred basic wire antenna for HF[2] so that I can use the high-performance VARA HF data mode and especially the great <u>VarAC</u> companion application.

Yeah, I know - it's a <u>First World problem</u> to have all these interesting things waiting to be worked on.

N8GNJ SatNOGS Station?

A old item on my project list (with no hardware acquired yet) with a bit of new urgency is to assemble a <u>SatNOGS station</u> to help gather downlinked telemetry data from the growing number of small research satellites.

While the SatNOGS project is quite a success (See ZR > BEACON below for an update), there are a lot of gaps in its worldwide coverage. Given the density of technically-capable Amateur Radio Operators here in the Pacific Northwest[3], I was surprised that there are only a few SatNOGS stations. The <u>closest SATNOGS station</u> to me in Bellingham, Washington, USA is on Vancouver Island in Canada, but it doesn't seem to be active. Thus there is a need in this region for a (or more) functioning SatNOGS station. A SatNOGS station seems like a cool project with multiple fun elements:

- It's Zero Retries Interesting - data communications, space, etc.

- There's a need (for more SatNOGS stations in this region),

- There's an element of community,

- There's an element of science,

- It involves radios,

- It involves Raspberry Pi computers,

- There's some construction involved, perhaps even some 3D printing,

- It has the potential to be a cool project for nearly any techie (SatNOGS stations are receive-only so you don't even need an Amateur Radio license). Thus, potentially this can be replicated as a STEM project nearly anywhere.

- There's lots of room for improvement and iteration when building up a SatNOGS station,

- It's great fodder for articles and presentations.

I'm not sure if it's feasible to commit to building a SatNOGS station… but it sure sounds fun to me and it serves a bit more of a higher purpose than personal experimentation. I'll have to decide if this is my highest priority Amateur Radio Project, and if I do, to get it done, I'll need to **Focus** on it.

73,

Steve N8GNJ

MMDVM Project - Clarifications on MQTT

By Jonathan Naylor G4KLX

*This is in response to my article in Zero Retries 0119 - <u>MMDVM Project Update</u> and my expressed confusion over the role of <u>Message Queuing Telemetry Transport (MQTT)</u> being incorporated into MMDVM. Note that G4KLX will be the presenter at the **Annual Update on the MMDVM (Multimode Digital Voice Modem) Open Source Project** presentation at <u>Pacificon next weekend</u>. Have fun at Pacificon! Wish I could have attended this year! - Editor.*

We're still debugging the MMDVM-TNC, but once we have 9600 bps working, we'll try the 19200 bps mode. I am not sure we can get 38400 bps into 12.5 kHz though, probably 25 kHz or maybe a little less. We've also found some interesting packets being generated by BPQ Code that is tripping up the new IL2P checksum option. We have a workaround but ultimately it needs fixing at source. I hope my own Linux AX.25 stack doesn't generate such oddness.

I'd like to clarify the use of MQTT with the MMDVM (not MMDVM-TNC), it's being used to move data around between programs and external entities like web pages and display drivers, and APRS data. In fact almost everything except for the digital voice data which is being moved by the current UDP protocols within the computer, usually a Pi, or externally.

MQTT is a nice way to portably allow data to be produced and consumed for status information mostly. That way I hope we can simplify the various elements of the MMDVM system and hand it off to external programs that can communicate with the MMDVM via MQTT and well structured JSON data. The important things to note is that MQTT is not being used for real-time data that has time constraints, more for internal status tracking.

It probably sounds more complex than it is. I probably need to create some sort of diagram to explain it. I've done the first version of my presentation for Pacificon and I hope I can sneak such a diagram into the final revision. I have until Wednesday evening to do so.

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Pre-announcing the Book - Zero Retries Guide to Amateur Radio in the 21st Century

By Steve Stroh N8GNJ

I'm working on a book as a reference for the myriad of Zero Retries Interesting subjects I've been writing about here in Zero Retries.

Image courtesy of Pixabay.com

Motivational author and speaker Seth Godin is one of a few folks that I consider a virtual mentor in my unusual path to being a writer. Godin writes a daily blog and this nugget of writing wisdom came up recently (in a link):

> The best time to start promoting your book is three years before it comes out. Three years to build a reputation, build a permission asset, build a blog, build a following, build credibility and build the connections you'll need later.

This goes against another bit of wisdom that one should under-promise and over-deliver, and don't talk about something until it's ready.

But I really see Godin's point, that announcing a book like Zero Retries Guide to Amateur Radio in the 21st Century (ZRGARC21)… *ZR book* only *after* it's completed and *then* begin promoting it would be a hard, slow sell. The ZR book will be about a niche (the eclectic definition of *Zero Retries Interesting*) of a niche (Amateur Radio), so it's going to have a small audience. In considering the creation of the ZR book, I think it's instructive that by the end of 2023, it will have taken Zero Retries two and a half years to reach 1000 subscribers.

Zero Retries is *free* and published *every week*, so the barrier for being a reader of this sort of material is pretty low. Thus Godin's advice to pre-announce a book well in advance feels right… at least for me, and at least for the ZR book.

To date, I have an outline for the ZR book… but it's a pretty *dense* outline, and I've been working on it regularly for some time when I have butt-in-chair time that isn't otherwise allocated to Zero Retries.

A few likely Frequently Asked Questions about the ZR book:

Q. A book? How quaint. Not a website?
A. Yeah, I know, but I'm of the generation that loves books, and there's a lot of utility for the way a self-contained "book" organizes a range of information such as I present in Zero Retries. There will eventually be a companion website for the book.

Q. When will the ZR book be available?
A. On a Tuesday4 😊. In 2024.

Q. Will the ZR book be free?
A. Kind-of / To be determined. There will be some version of the ZR book available for free. For example when I release v2.0, I may release v1.0 as a free PDF. But the primary distribution of the most current version of the ZR book will be for purchase.

Q. Version 1.0? 2.0? Do you mean First edition, Second edition, etc.?
A. Yes, kind of, but "editions" are a bit out of date. I intend that the ZR book will be continuously updated, and I will update it frequently so that there will be interim versions, such as a Version 1.1, 1.2, etc.

Q. Will it be a printed book, or ebook?
A. Yes 😊 It will be available as a PDF (with no Digital Rights Management) and a printed version via Lulu.com. I intend to find some way to serialize it as I'm writing it for those that want to have early access, want to help by being "beta readers", etc. For example, start a new newsletter or use Leanpub. I intend to update the ZR book often, perhaps as often as quarterly, to keep up with developments within the scope of the book. Each time I update it will be a new book (version); at any time a buyer can elect to purchase an ebook or a printed book of whatever is current.

Q. What is the ZR book *about*?
A. Example chapters include Software Defined Receivers, Software Defined Transceivers, GNU Radio, MMDVM, VARA HF and FM, Classic Packet Radio, a GEO Amateur Radio Satellite for the Americas, AREDN / Microwave Networking, New Packet Radio, and many other topics that I've discussed here in Zero Retries. While I won't be cutting and pasting what I've written in Zero Retries and calling it a book, if you've been reading Zero Retries from the beginning, you'll see a lot of familiar ideas .

Q. Will I be able to understand the ZR book?

A. I don't intend the ZR book to be deeply technical, much like Zero Retries is an overview of technological innovation in Amateur Radio. My goal for the ZR book is for it to be an approachable overview of the most technologically interesting aspects of Amateur Radio. It's the book I want to be able to hand a techie that expresses an interest in Amateur Radio, confident that they'll be able to find something in the ZR book that they'll find interesting about Amateur Radio and perhaps want to get involved.

Q. Illustrations, or all text-yak-yak?

A. Fair question! Unlike the email-constrained Zero Retries newsletter, I'll have lots of space for illustrations in the ZR book.

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Image courtesy of Digital Library of Amateur Radio
& Communications / Internet Archive

What's new at DLARC - October 2023

By Kay Savetz K6KJN

It's been a productive month of archiving ham radio content at the Digital Library of Amateur Radio and Communications.

I've added a bevy of great material for fans of EME (Earth-Moon-Earth) communication, including 320 issues of the 432 MHz and Above EME Newsletter spanning 1996 to the present. The newsletter has been published since the early 1970s by Dr. Allen Katz K2UYH — we're still hoping to find pre-1996 issues to add to the library. I've also added 83 issues of DF2ZC's 144 MHz EME NewsLetter, with issues form 2015 to the present. That newsletter began in 2003, so again we're hoping to find pre-2015 issues to complete the collection. Curating DLARC project is a constant game of filling in holes in collections. Sometimes it's satisfyingly possible; other times the material is tragically lost to time.

One more for EME fans: I'm in the process of finding and adding material from the International EME Conference. The first EME con took place in 1966, but the conference really seems to have found its groove with bi-annual meetings beginning in 1988. Photos, papers, presentations, and occasional videos from the various conferences are scattered in many places, and I'm working to gather them into a single DLARC collection. I'm working forward in time, and have processed though 2014 so far.

I've also scavenged the FCC's web site for material relevant to DLARC: this has ended up in three collections. One is Radio Service Bulletins, 1915-1932: Radio Service Bulletins were issued monthly by the Bureau of Navigation (and later the Radio Division, Department of Commerce) from January 1915 into the 1930s to keep mariners, aviators, and radio listeners abreast of developments in the new medium of radio. The FCC has a nice collection that I added to DLARC. Also, I added more than 300 FCC Radio History documents relating to the earliest days of radio broadcasting, important rule changes, and controversies. Finally, I dug up every Federal Communications Commission document (EDOCS in their parlance) related to amateur radio — nearly 4,000 of them, totaling 43 gigabytes — and put them in the new DLARC FCC collection. (Side note: ChatGPT was instrumental in writing code to gather the EDOCS from the FCC's web site, then process the metadata. The era of asking a computer to write computer programs is here, and it's amazing.)

Publications newly added to DLARC include The Wireless Age, with issues from 1913 to 1925; and Ham-Mag, a PDF-only amateur radio magazine that was published in French and English from 2008 to 2011 (or so?) by Vincent Faucheux F5SLD. I've found 68 issues. There are definitely missing issues, especially in the English edition, and I'm not sure when the last issue was published.

I've added two podcasts about Morse code: the WD8LQB Morse Code Podcast, a short-lived podcast from 2006 to teach Morse code; and DitDit, which features "conversations with interesting CW operators."

Finally, I've added a bunch of club newsletter collections, too many to list but you can peruse the latest additions here. Two of note are 294 issues of the Winnipeg Amateur Radio Club newsletter from 1993 to today, and 68 issues of Contest Gazette, from a Florida group focused on contesting

Oh, and I was interviewed by Hap Holly about DLARC in the latest episode of the RAIN Hamcast. I don't want to hear myself talk so I haven't listened to it, and have no idea what I might have said.

Digital Library of Amateur Radio & Communications is funded by a grant from Amateur Radio Digital Communications (ARDC) to create a free digital library for the radio community, researchers, educators, and students. If have questions about the project or material to contribute, contact me at kay@archive.org.

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ZR > BEACON

By Steve Stroh N8GNJ

Short mentions of Zero Retries Interesting items.

[SatNOGS] Eight Million Observations

> The SatNOGS Network has achieved yet another amazing Milestone! It has reached its eight millionth observation, and we are deeply grateful to the entire Community for this achievement!
>
> On the 11th of August 2023, observation #8000000 was uploaded on the SatNOGS Network by station 2173 – PE0SAT-21 in the Netherlands. The observation was scheduled by Jan Van Gils (PE0SAT), receiving data from satellite TigriSat. The eight millionth observation is of good quality.
>
> It is an observation coming from an operational satellite that has been making its way through space for almost ten years.

SatNOGS is a perfect example of a Zero Retries Interesting activity, and it's doubly cool that you can get started with this radio + space project with little more than a do it yourself antenna, a Raspberry Pi, and an inexpensive Software Defined Receiver thanks to the great documentation SatNOGS provides. A bonus is that because it's receive-only, you can get started without an Amateur Radio license.

A Look Inside the V2 Universal Radio Controller

From Mark "Herb" Herbert G1LRO:
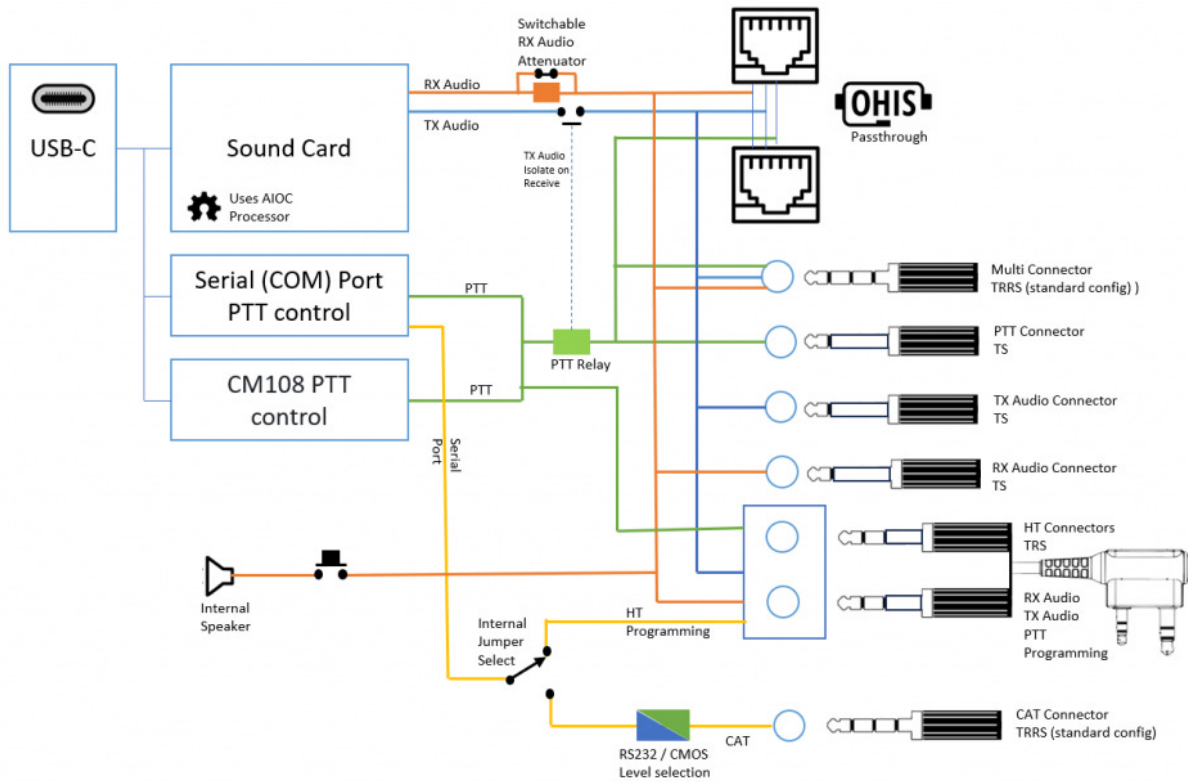
Image courtesy of Mark Herbert G1LRO

Image courtesy of Mark Herbert G1LRO

The second version of the Universal Radio Controllers evolves several features of its predecessor and has additional Computer Aided Transceiver (CAT) capabilities.

Other than the new CAT feature, the notable changes from the V1 edition are:

- Hardware relay for PTT for maximum versatility and reliability.

- TX audio isolation during receive (the mic line has no load so is fully passive)

- An attenuation setting for radios that have particularly loud RX audio, to avoid overloading the sound card input.

Bookworm — The New Version of Raspberry Pi OS

I was surprised that there weren't more specific updates in Bookworm to accommodate the new Raspberry Pi 5. The major changes in Bookworm are:

> …using **Wayland** rather than X11 as the display system.

> … PulseAudio has been replaced with the newer **PipeWire** audio system. This builds on the features offered by PulseAudio, most importantly in providing better support for audio accompanying video.

> During Bullseye, we rolled out the use of the **NetworkManager** network controller as an option which could be selected in raspi-config. This is now the standard control mechanism for networking in most Linux distributions, and is now the default network controller for Bookworm, replacing the previous system, dhcpcd. NetworkManager does everything dhcpcd did, but adds a bunch of extra functionality, including the ability to connect to hidden wireless networks, to connect to virtual private networks (VPNs), and to use a Raspberry Pi as a wireless hotspot. It also includes a lot more customisation options for those who wish to fiddle with the nitty-gritty of their network connection.

> One other significant change is that we are now offering a second browser option, with the launch of a Raspberry Pi-optimised version of **Mozilla Firefox**.

> This is the first time we've officially supported Firefox…

Of course, all of these fundamental changes, especially that the default for the Raspberry Pi 4 and 5, for optimum performance, will be 64-bit and thus will probably break a lot of Amateur Radio applications. But all of these fundamental updates bode well for Raspberry Pi 5 to be quite the powerhouse for Amateur Radio usage.

Zero Retries Interesting Job - Starshield Senior RF Engineer

> Starshield leverages SpaceX's Starlink technology and launch capability to support national security efforts. While Starlink is designed for consumer and commercial use, Starshield is designed for government use, with an initial focus on earth observation, communications, and hosted payloads. As a Sr. RF engineer on the Starshield team, you will be working on advanced development programs in support of US National Security.

Just one of *many open positions for Starshield*. This one is based in Redmond, Washington, USA.

Zero Retries Interesting Job - [Intelsat] Senior Teleport Technician

> As a key member of our Technician's team at our Teleport on the north shore of Oahu, you will ensure communications equipment operates properly and delivers the highest standard service to our customers.
>
> In the role of Senior Technician in a 24/7 Teleport you can showcase your strong technical skills and know-how to perform complex routine on-site installation and repair of equipment as well as preventive maintenance. As you are proficient to the various competencies of the job, you will have the opportunity to act as mentor to junior team members.

Working at a satellite Earth Station *in Hawaii*… yep, that's Zero Retries Interesting! It's not just a job, it's a vacation!

Join the *Fun* on Amateur Radio

If you're not yet licensed as an Amateur Radio Operator, and would like to join the fun by *literally having a license to experiment with radio technology*, check out **Join the Fun on Amateur Radio** for some pointers.

Zero Retries Frequently Asked Questions (FAQs) — In development 2023-02.

Closing the Channel

In its mission to highlight technological innovation in Amateur Radio, promote Amateur Radio to techies as a literal license to experiment with radio technology, and make Amateur Radio more relevant to society in the 2020s and beyond, Zero Retries is published via email and

web, and is available to everyone at no cost. Zero Retries is proud *not to participate* in the Amateur Radio Publishing Industrial Complex, which hides Amateur Radio content behind paywalls.

My ongoing *Thanks* to:

- Tina Stroh KD7WSF for, well, *everything!*

- *Founding Members* who generously support Zero Retries financially:
  Founding Member 0000 - Steven Davidson K3FZT
  Founding Member 0001 - Prefers to Remain Anonymous 01

  Founding Member 0002 - Chris Osburn KD7DVD
  Founding Member 0003 - Don Rotolo N2IRZ
  Founding Member 0004 - William Arcand W1WRA
  Founding Member 0005 - Ben Kuhn KU0HN
  Founding Member 0006 - Todd Willey KQ4FID
  Founding Member 0007 - Merik Karman VK2MKZ

- Numerous Annual and Monthly subscribers who also generously support Zero Retries financially!

Want to Support Zero Retries?

- The *most* effective way to support Zero Retries is to simply mention Zero Retries to your co-conspirators that are also interested in knowing more about technological innovation that is occurring in Amateur Radio and encourage them to become a fellow subscriber.

- One particularly effective method of promoting Zero Retries is to add a mention of Zero Retries to your QRZ page (or other web presence) and include a link:

  https://www.zeroretries.org

  If you'd like to financially support Zero Retries, becoming a paid subscriber is *greatly* appreciated and helps offset expenses incurred in publishing Zero Retries. Paid subscriptions for Zero Retries are *entirely optional*, as explained in this special issue of ZR:
  Zero Retries Administrivia - Activating Payment Options.

These blogs and newsletters regularly feature Zero Retries Interesting content:

- Dan Romanchik KB6NU mentions "Zero Retries Interesting" topics so regularly on his blog (that I otherwise wouldn't know about) that I've bestowed on him the honorific of Pseudostaffer.

- Jeff Davis KE9V also mentions "Zero Retries Interesting" topics so regularly on his blog (that I otherwise wouldn't know about) that I've bestowed on him the honorific of Pseudostaffer.

- Amateur Radio Weekly by Cale Mooth K4HCK is a weekly anthology of links to interesting Amateur Radio stories.

- Experimental Radio News by Bennet Z. Kobb AK4AV discusses (in detail) Experimental (Part 5) licenses issued by the US FCC. It's a *must-read-now* for me!

- RTL-SDR Blog - *Excellent* coverage of Software Defined Radio units.

- TAPR Packet Status Register has been published continuously since 1982.

- Other Substack Amateur Radio newsletters recommended by Zero Retries.

These YouTube channels regularly feature Zero Retries Interesting content:

- HB9BLA Wireless by Andreas Spiess HB9BLA

- KM6LYW Radio by Craig Lamparter KM6LYW (home of the DigiPi project)

- Modern Ham by Billy Penley KN4MKB

- Tech Minds by Matthew Miller M0DQW

Zero Retries is currently using the Substack email publishing platform to publish Zero Retries. It's particularly suitable for small newsletters as you can get started for no cost.

If you're reading this issue on the web and you'd like to see Zero Retries in your email Inbox every Friday afternoon, just click below to join ~~100~~ ~~200~~ ~~300~~ ~~400~~ ~~500~~ ~~600~~ ~~700~~ ~~800~~ *900+* other subscribers:

Please tell your co-conspirators about Zero Retries — just click:

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Offering **feedback or comments** for Zero Retries is equally easy — just click:

Leave a comment

If you're a fellow smart person that uses **RSS**, there *is* an **RSS feed for Zero Retries**.

Zero Retries (N8GNJ) is on Mastodon — n8gnj@mastodon.radio — just click:

Zero Retries / N8GNJ on Mastodon

Email issues of Zero Retries are "instrumented" by Substack to gather basic statistics about opens, clicking links, etc.

More bits from Steve Stroh N8GNJ:

- SuperPacket blog — *Discussing new generations of Amateur Radio Data Communications — beyond Packet Radio (a precursor to Zero Retries)*

- N8GNJ blog — *Amateur Radio Station N8GNJ and the mad science experiments at N8GNJ Labs — Bellingham, Washington, USA*

Thanks for reading!
Steve Stroh N8GNJ / WRPS598 (He / Him / His)
These bits were handcrafted (by a mere human, not an Artificial Intelligence bot) in beautiful Bellingham (The City of Subdued Excitement), Washington, USA, and linked to the Internet via **Starlink *Satellite* Internet Access**.

2023-10-13

If you'd like to reuse an article in this issue, for example for club or other newsletters, just ask. Please provide credit for the content to me and any other authors.

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Blanket permission granted for TAPR to use any Steve Stroh content for the TAPR Packet Status Register (PSR) newsletter (I *owe* them from *way* back).

1
My donations to DLARC aren't yet complete; next up a large cache of Amateur Radio manuals, most of which are not yet in DLARC.

2
A basic HF wire antenna may not be deferred until Spring - that's been so long in the queue that I'll probably "slap something up" sooner, though it will have to be reasonably robust to survive the "Whatcom Winds" here.

3
Not to mention nearby metro Seattle, Washington, USA being the headquarters of both SpaceX Starlink and Amazon Project Kuiper broadband Internet access satellite systems.

4

I'm cribbing this whimsical answer from a friend Jeff Francis N0GQ. When people would find out that he was building a Zenith CH-750 kit plane, they *always* asked *when* he thought he would complete the project… and it got old. Typically a kit plane takes years to build. Thus N0GQ came up with that gentle, humorous answer to what had become a tedious question.

A guest post by

Kay Savetz K6KJN
Kay is curator of Internet Archive's Digital Library of Amateur Radio & Communications (https://archive.org/details/dlarc)

A guest post by

Jonathan Naylor
I am Jonathan G4KLX, author of the MMDVM, the MMDVM-TNC and other random software that is to be found in various places in the hobby.

Subscribe to Jonathan