

Inconvenient Truths About WINLINK & FLDGI/FLMSG: Disclosure of Experimental Findings, Advanced Developments, and Discussions

September 19, 2019

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EXECUTIVE SUMMARY

Although RM-11831 specifically addressed techniques rather than systems, as has been pointed out repeatedly by its author, the debate was obviously broadened to include systems, specifically the WINLINK messaging system, by multiple filers, some of whom claimed to be experts. The WINLINK team was not in any way arrogant to presume they were being assailed. Provably false assertions were repeatedly made, which any expert with a knowledge of radio and history would have easily recognized as false. Anecdotal claims were advanced repeatedly. False assertions of "encryption" or the pseudo-term "effective encryption" were bandied about, and multiple harsh demands were levied. Assertions of UN-enforceability or the impossibility of self-policing were loudly asserted.

Nevertheless, the goal of openness in Amateur Radio was a laudable target, to which the WINLINK Development Team responded with the first open, networked, distributed, free receiver system, even including a 21-day rolling history, with easy ways to flag objectionable material and a well-oiled administrative system manned by dedicated volunteers to process such reports.¹ I have made such reports, and I have watched this self-policing system operate. The result was an astonishing two orders of magnitude objectively-measured drop in objectionable material, **demolishing** any claim of lack of enforceability or inability of self-policing. The critics of WINLINK earned **well-deserved praise** for their participation in developing techniques to catch those violating the very stiff Terms of the WINLINK system in my writings.

Objective measurements of worst-case interference from legal 97.221(c) WINLINK 500-Hz ACDS gateways were made, which revealed even worst-case interference was vanishingly small, on the order of hundredths, to thousandths of 1%. Not only did no one refute this objective finding, certain WINLINK opponents even embraced it, which of course is their right. True data are true data and are available for any policy-maker on either side of an issue to use for more-enlightened policy development

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¹ In my opinion, the WINLINK viewer system is the best thing that ever happened to WINLINK.

After the **stunning breakthrough of the reading of a WINLINK compressed message** using simple cut-and-paste techniques by John S. Huggins KX4O, since no one else was willing to work out the software, I began to teach myself the C-language once again. After initial fumbles, I created the first working monitoring software on a Raspberry Pi, in **five days of effort**.²

This software is laughably simple, comprising only a few steps. A true expert skilled in the art would have created it in a matter of hours. *Why this was not done, in favor of 19 years of bickering, remains a mystery to me.*

That should have been a cause for enormous celebration for the critics of WINLINK. For the first time, they had free software to literally read WINLINK. However, there were then even more demands that it be tested in more difficult circumstances. This report therefore provides the evidence drawn from many hot and sweaty hours of actual monitoring at great distances and under real conditions on the 20 meter band, that the PACTOR modem and this software (as improved, with various bug fixes along the way) works even better than I would have dreamed, and multiple 900-mile messages have been rather easily monitored, in whole or in part.

At the same time, serendipitously, an example of the incredible power of even two receivers coupled in a diversity receiving network was discovered, leading to the conclusion that the entire 36,000 character George Washington Farewell Address could have been perfectly received over a 900 mile path. At least two other testers have already found success as well. Yet there has been a surprisingly small number of requests for these ground-breaking free software packages, when compared to the howl of voices demanding their creation.

A breakthrough not seen in 30 years was then achieved when Hans-Peter Helfert literally rewrote the venerable public domain LZHUF_1 algorithm, so that compressed messages are decoded now ON THE FLY rather than after all the packets are received.³ **Never done before.**

It became increasingly obvious throughout all this work that the real reason that WINLINK compressed transfers were not immediately readable, is simply the limitations of their software applications. These systems are typically developed with software designed expressly to handle the expected scenario of one transmitter, involved in a "connected" situation with the receiver, so that packets are delivered via a known mechanism, and predictably following a rigid protocol. *It is likely that no previous developer of the five or more similar systems ever contemplated designing for the monitoring situation where TWO transmitters are pumping out packets, neither of which is "connected" to the monitor.* The publicly available decompressing algorithms of such systems merely need to be recast into a different software application to first distinguish which stream of packets to follow (that of Transmitter 1, or that of Transmitter 2?) and then to properly route the resulting data stream to the publicly known decompression routine -- and monitoring is then rather easily achieved.

2 Gibby: <https://ecfsapi.fcc.gov/file/10830048730238/FreeSoftwareToReadWINLINK.pdf>

3 Current version of executable at time of this writing, with instruction manual: <https://1drv.ms/u/s!AtLEi-HvIIdLjh92-EIK-dZhnQOp?e=MhJe2s>

The **truly flawed criteria** that *"If I can't read it with my eyes, it must be encrypted or effectively encrypted!"* was used by so many, including those who claimed themselves to be experts. This exact scenario had been feared by the actual experts, as revealed in a comment by Phil Karn, KA9Q.⁴

But to make a bad situation even far worse, this flawed criteria was then applied in a blatantly biased and prejudiced manner over a period of years against only one target in the sea of systems using compressed, ARQ transfers. I have not yet found any evaluation of the multiple other such systems by these supposed experts. A simple trial of one such popular, and well-accepted, unencrypted software system, FLDGI/FLMSG, quickly demonstrated that in the monitoring situation, callsigns are visible, but other material *appears* unreadable, and my efforts so far to decompress the known **unencrypted** encoded message using the provided application have been unsuccessful. *This is precisely the criteria used by these "experts" to condemn WINLINK, but never apparently tested on FLDGI/FLMSG, D-RATS, PAT (FD protocol), BPQ or the original such system, FBB, 3 decades in existence. The evaluation and treatment of this class of legal amateur radio systems, accepted on multiple continents, by this group bears more resemblance to the actions of a mob having picked out their victim, than that of true experts*

This whole sad, sorry affair should now be over.

- The amazing software now provided (at no charge) reads WINLINK PACTOR whenever there is a reasonable signal level, demonstrated over hundreds of miles, multiple times.
- An initial proof of the incredible power of a distributed network to make such copy asymptotically perfect is now presented. See Section 3.
- The anecdotal complaints of 97.221(c) "interference" have been demolished by actual objective original research, made public on April 8, 2019.⁵
- The anecdotal complaints of violative behaviors on the WINLINK system have now been turned into quantifiable measurements, and reduced by an amazing 2 orders of magnitude to almost zero levels.⁶

Misguided resolutions by deliberative bodies to address non-existent ACDS "problems" with new restrictions on the privileges of amateur radio operators in the face of adverse objective evidence, fix *nothing*, reduce the potential for graceful expansion of possible pre-configured ACDS stations outside the limited 97.221(b) slivers, in a time of emergency, and significantly and needlessly harm innocent bystanders such as JS8, which has promise for both conversational enjoyment as well as infrastructure-independent service in time of disaster. **Such resolutions should be reconsidered, and withdrawn.**

Additional restrictions on the allowable frequency usage of ≤ 2800 Hz digital waveforms by human-operated stations are also a **significant mistake** in my opinion, given the complete absence of any known study demonstrating statically significant interference.

4 Karn: <https://forums.qrz.com/index.php?threads/new-digital-petition-at-the-fcc-rm-11831.652589/page-178#post-5093201>

5 Gibby: <https://ecfsapi.fcc.gov/file/10408063816674/FCCRM11831-2.pdf>

6 Gibby: <https://ecfsapi.fcc.gov/file/10822196770221/ReAnalysisOfWinlinkObjectionableMessages.pdf>

Obviously, *sincere, detailed, and public retractions* of all the now-known-to-be-false prejudiced assertions against the Winlink Development Team and SCS (many of which are documented herein) are now in order by many.

I have poured hundreds and hundreds of hours into performing multiple **objective, original studies** fully disclosed, to develop and quantify the true facts in this issue. I developed software literally by re-learning a computer language, with a book at my side, when experts did not rise to assist,⁷ because I thought *some of the requests of the respondents were quite reasonable* --- even if they did not realize their bias.

- I now call on amateur radio operators, leaders and national organizations to work cooperatively, rather than adversely, with the WINLINK Development Team to further my work, and that of Hans-Peter Helfert, so that all techniques utilized by the WINLINK message passing system are fully monitorable over the air. This should be a simple task for true experts completed swiftly with appropriate modifications to the input data capture portions of my, or Peter's work.
- I further call on amateur radio operators, leaders, and national organizations to work cooperatively with any still-living developers of other such systems, to provide the simple adjustments to their software packages so that all those packages can also be fully monitored over the air.
- I again urge the FCC to provide language giving digital forwarding stations additional protection from unwarranted liability for messages **created or allowed by others** to flow through them, similar to that of repeater trustees, just as I have previously requested.⁸

Nineteen years of potential effort on other needs have been wasted on interminable arguments. It is time to be done with this, to develop the simple adjustments necessary to reach universally-agreed upon desired outcomes, *and then move on.* Much useful research in many areas is now possible with these systems, as my work herein has now shown.

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7 John Huggins created a thread and asked for assistance in two forums. See: <https://forums.qrz.com/index.php?threads/decode-off-the-air-winlink-message-request-for-programming-help.668470/>

8 See Responsibilities of the Message Gateway Station Operator, p 19, in <https://ecfsapi.fcc.gov/file/10830048730238/FreeSoftwareToReadWINLINK.pdf>

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DISCLAIMERS

1. I am not a member of the WINLINK Development Team; these opinions and data are my own.
2. I cannot independently verify the identifies of person using various names or callsigns on either amateur radio forums or FCC comment systems. Therefore, all I can do is display the name or callsign that was associated with the comment, on the site or system on which I found the quote or comment. If these person were hijacking another account or misrepresenting their identity, there is nothing I can do to prevent that.
3. I have no desire or interest to misrepresent or misquote anyone or their position. Please accept my sincere apologies if it appears I have done so, and notify me of the same, so that I can deal appropriately with the error.

NOTE

An offer was made on QRZ.COM forums, and emailed to significant participants, to receive a draft copy of this document, to allow them to explain where I might have misrepresented their position, or in case they wished to modify their position. Dr. Rappaport was traveling and difficult to reach, so a copy was simply emailed to him to give him the chance to review this material. There were no requests for a copy of the material.

INTRODUCTION

In a previous disclosure, I reported that **I had created software that allowed an uninvolved (unconnected⁹) monitoring radio system to read compressed WINLINK transmissions from the airwaves.** ¹⁰ **In this document I will demonstrate how this has been now tested over 900+ mile pathway and other conclusions and developments.**

Why was this WINLINK development necessary in the first place?

Although the author of the petition on which RM-11831 is based, often correctly states that his petition was NOT about WINLINK^{11 12}, the actual fact is that WINLINK's compressed text has remained at the center of the discussion throughout due to the statements of others, as well as discussion that has been held with the petition author. . Detractors seemed completely unaware of all the other current and historical amateur radio systems utilizing compression in the last 30 years, and asserted many false myths about LZHU_F_1 compression.¹³ Based on the assertions of multiple persons, including at least one expert,¹⁴ creating such software to read WINLINK transmissions **should have been impossible.** In actual fact, the creation of the actual reading software by a person who hadn't done significant programming in 30 years, took precisely 5 days of off-hours work.

9 In ARQ parlance, two stations communicating in an error-free exchange are said to be "connected." Other stations generally cannot join in that two-way acknowledge/request error-free exchange. Other stations can monitor, but not request resends of missed packets.

10 Gibby: <https://ecfsapi.fcc.gov/file/10830048730238/FreeSoftwareToReadWINLINK.pdf>

11 K0IDT: <https://forums.qrz.com/index.php?threads/how-many-ham-systems-use-compression.672189/page-30#post-5196295>

12 K0IDT: "The whole thing was never about Winlink or Pactor. One arrogant group thinks the world revolves around them and made it all about themselves and their system " <https://forums.qrz.com/index.php?threads/huggins-did-it.667817/page-57#post-5178599>

13 Gibby: <https://ecfsapi.fcc.gov/file/10906223525884/ExParteMyths.pdf>

14 Rappaport: "I am a technical expert in the wireless communications field " [https://ecfsapi.fcc.gov/file/1040322516387/FCC Letter RM 11831 final.pdf](https://ecfsapi.fcc.gov/file/1040322516387/FCC%20Letter%20RM%2011831%20final.pdf)

These persons had made various assertions that the WINLINK system (which uses multiple techniques) at least when using PACTOR, was "encrypted"¹⁵ or "effectively encrypted"^{16 17} (a novel term with an uncertain definition).¹⁸ or "masked"¹⁹ or "secret"²⁰ or "obscured"²¹ and that such systems were a threat to national security.^{22 23} This debate had apparently gone on from 3-19 years depending on the participant, without any seeming end to the bickering.²⁴ John S. Huggins KX4O appeared to blow these claims completely up by demonstrating a cut-and-paste technique to first partially read²⁵, and later perfectly read a WINLINK email.^{26 27}

It is embarrassing to me that these claims were made, were then addressed by a truly knowledgeable expert²⁸ and were then NOT known to be retracted by the persons who made such claims. The embarrassment is intense for all of the following reasons:

- The compression system utilized in WINLINK is public-domain and has been for 30 years.²⁹

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- 15 W3WN -- after weeks of definitive proof by Huggins, myself and Hans-Peter Helfert to the contrary-- stated that my "over-the-top efforts to somehow led legitimacy to WinLink **encryption** begins to make one wonder what you are trying to hide by doing so. " [emphasis added]. <https://forums.qrz.com/index.php?threads/can-anyone-read-fldigi.673378/page-13#post-5197213>
- 16 Rappaport: "RM-11831 cures the existing problem of effectively-encrypted and proprietary ARQ traffic (including Pactor 3 and other modes like WINMOR, STANAG, ARDOP) that cannot be intercepted over the air by other ham operators or the FCC. " <https://ecfsapi.fcc.gov/file/1040322516387/FCC%20Letter%20RM%2011831%20final.pdf>
- 17 Rappaport: "Enactment of RM-11831 would cure existing problems with many data transmissions that: ... (iii) provide a national security risk using effectively encrypted signals while harming our long term efforts in promoting STEM education..." <https://ecfsapi.fcc.gov/file/10429199250117/FCC%20Letter%20Reply%20to%20Comments%20RM%2011831.pdf>
- 18 K0IDT referenced it this way: "If it can't be monitored to determine if it's encrypted, it's the same as encryption. And I'm well aware of the possibilities and capabilities with "steganography". " <https://forums.qrz.com/index.php?threads/new-digital-petition-at-the-fcc-rm-11831.652589/page-180#post-5095161>
- 19 Rappaport: "These masked transmissions are"
- 20 Rappaport: "to eliminate the use of private email and **secret file transfers** that are currently being transmitted in the amateur radio spectrum." [emphasis added] <https://ecfsapi.fcc.gov/file/10429199250117/FCC%20Letter%20Reply%20to%20Comments%20RM%2011831.pdf>
- 21 Rappaport: "so that the meaning of all messages are not obscured when copied over the air." https://ecfsapi.fcc.gov/file/1052998397105/Dear_FCC_letter.docx
- 22 Rappaport: "Implementation of RM-11831 will safeguard the national security of the United States " https://ecfsapi.fcc.gov/file/1040322516387/FCC_Letter_RM_11831_final.pdf
- 23 Wendelken, S. Rappaport Suggests National Security Risks with Amateur Radio Violations, Radio Resource International, accessed at: <https://www.rrmediagroup.com/News/NewsDetails/NewsID/17667>
- 24 An earlier clever demonstration that WINLINK could not be encrypted [an explicitly limited-goal demonstration] was dismissed by K0IDT: "What record? The bogus proof of concept that was presented earlier in the thread? That demo could have been done with a cable between the radios. I don't call two radios side by side an adequate demonstration of off-air-monitoring. " <https://forums.qrz.com/index.php?threads/new-digital-petition-at-the-fcc-rm-11831.652589/page-181#post-5095858>
- 25 Huggins: <https://forums.qrz.com/index.php?threads/new-digital-petition-at-the-fcc-rm-11831.652589/page-86#post-5026997>
- 26 Huggins: https://ecfsapi.fcc.gov/file/1073182572879/KX4O_Demonstration_OTA_Winlink_Decoding.pdf
- 27 Huggins: <https://www.hamradio.me/graphs/WinlinkTests/ztemptest.txt>
- 28 KA9Q: " Rappaport continues to use the inflammatory and misleading term "effectively encrypted" " <https://ecfsapi.fcc.gov/file/10513525129724/rm11831-rebuttal-to-rappaport.pdf>
- 29 When KA9Q pointed this out to K0IDT, the response was: "If you want to provide a demonstration of a full decode of a random off the air decode of a linked, compressed transmission, I'll consider that statement valid. " <https://forums.qrz.com/index.php?threads/new-digital-petition-at-the-fcc-rm-11831.652589/page-180#post-5095184>

- There is no encryption algorithm in WINLINK software, and compatible versions by John Wiseman have long been available for review. Any expert could have examined the code and determined there is no encryption.³⁰
- There is no encryption algorithm in PAT software, which is also available for review^{31 32 33}
- To my knowledge, there is no encryption algorithm in D-RATS, a system that also uses LZHUF compression and ARQ
- I know of no encryption algorithm in FBB software, which has been available for inspection for 20 years^{34 35}
- The German government does not allow German amateurs to utilize a modem that is not able to read its own output.³⁶ An expert would have been aware of that fact³⁷ or could have inquired of SCS.
- The technical characteristics of the PACTOR system have been published and unquestioned for years. They were sufficient for more than one competitor to replicate them. This makes it difficult to understand how they might be considered secretive.. .
- Some were completely confused as to the type of compression utilized in WINLINK³⁸, despite the fact that it is an extension of 20-30 year old FBB protocols which are publicly disclosed including software. Using PMON it is obvious that WINLINK data packets are sent with Type 0 packets³⁹ -- not using any native compression. The LZHUF_1 algorithm has been available since 1987 publicly---over 30 years.⁴⁰

30 K0IDT, in discussion with KA9Q appeared to misunderstand Phil's point that there was no encryption written into the code of the system, and instead produced an example where someone had intentionally inserted TEXT that appeared encrypted. The question you asked was "I'll help you by giving you an example of something I'd consider a smoking gun: running data through the Advanced Encryption Standard (AES) with a shared secret key. Can you find that anywhere in the system?" Well yes, I did find that on the "system", as you originally asked, and now you are denying the evidence you specifically asked for because it's not a feature? Yeah, not a feature just an enabling bug in the system that lets stuff like this get sent over the air. <https://forums.qrz.com/index.php?threads/new-digital-petition-at-the-fcc-rm-11831.652589/page-180#post-5095204> KA9Q tried to correct that misunderstanding: <https://forums.qrz.com/index.php?threads/new-digital-petition-at-the-fcc-rm-11831.652589/page-180#post-5095258> K0IDT did not understand Phil's point: <https://forums.qrz.com/index.php?threads/new-digital-petition-at-the-fcc-rm-11831.652589/page-181#post-5095786>

31 <http://getpat.io/>

32 PAT source code available at: <https://github.com/la5nta/pat>

33 <https://godoc.org/github.com/la5nta/wl2k-go/lzhuf>

34 FBB (F6FBB) [https://en.wikipedia.org/wiki/FBB_\(F6FBB\)](https://en.wikipedia.org/wiki/FBB_(F6FBB))

35 Link: ftp://ftp.f6fbb.org/pub/f6fbb/utills/lzhuf_1.zip This link however does not work; I was able to obtain it from one of the still extant mirror sites of the f6fbb site. The code is as one would expect for the lzhuF compression/decompression algorithm, and was a portion of what tipped Mr. Huggins and myself to the necessary steps to obtain decompression.

36 During initial testing of new waveforms, SCS has briefly tested waveforms for which the "PMON" portion of the system has not been fully developed -- and in those cases they are very careful to identify in CW. No systems are marketed that do not have full capability through one or more means to monitor their own transmissions. Personal communication, Hans-Peter Helfert DL6MAA.

37 DL6MAA: "The authorities in Germany are very strict and accurate. It would have been unthinkable to develop and distribute a shortwave amateur radio mode that does not provide a comprehensive monitoring mode in each modem as a standard tool." <https://forums.qrz.com/index.php?threads/huggins-did-it.667817/page-52#post-5177552>

38 NL7W demanded "proof" that the SCS compression was not utilized by WINLINK on Jan 5, 2019. <https://forums.qrz.com/index.php?threads/wide-bandwidth-digital-danger.639948/page-30#post-4924388>

39 PMON reports Type 0 packets as a pseudo-type, "Type 8" if it sees characters outside the normal ASCII alphabet, personal communication, Hans-Peter Helfert.

40 Discussion of historical compression algorithms: <https://oku.edu.mie-u.ac.jp/~okumura/compression/history.html>

The creation of the software to READ WINLINK took me only five days to finish my first working version, once I was able to read the first character from the DRAGON modem. This despite not writing any really significant code in 3 decades. The entire software that I had to write is in one routine -- no subroutines for fear of mixing up arguments and pointers. There is no dynamic memory allocation, just static arrays. There are very few variables even necessary. The structure of the solution is presented in overview fashion in a section below to demonstrate how simple was the solution to the argument waged for so many years by such self-professed experts. Why wasting all this time bickering rather than simply writing the code to do what was demanded, was chosen, is beyond me, given the gravity of the national security claims asserted.

Nevertheless some proponents demanded a software system;⁴¹ and this is what I created, and the results of which I am now disclosing.

However, merely the creation of that successful software was not sufficient for some of the proponents of measures similar to, or more aggressive than, RM-11831. Claims were made that success would not be believed until it was demonstrated over larger distances, or in certain cities, with certain out-of-the-box PACTOR modems, etc (see below). This is unnecessary for actual working systems. Any competent amateur able to handle a receiver and a modem should, with some practice, be able to utilize this software and satisfy themselves that it performs as others have found.

This report will disclose additional improvements and experiments to meet these changing goalposts and demands.

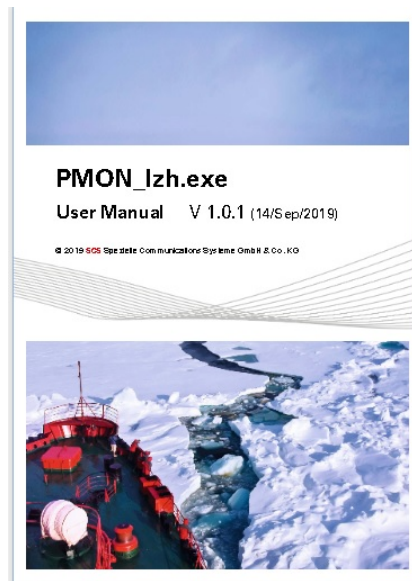
LATENCY

Other respondents demanded that monitoring not have any latency -- that the characters sent by a compressed system be made observable in real time rather than when the complete message had been assembled for de-compression. (This in spite of the known propagation delays of radio waves that always impose a latency on receiving signals, not to mention other delays inherent in modern digital signal processing.) Why this is crucial is not clear.

Even that demand has now, astonishingly, been met, by the completely unexpected developments created by Hans-Peter Helfert of SCS. LZHUF is a "sliding" algorithm that works on sections of text at a time. Hence, it was always known to true experts in this area, that characters were being decoded as the algorithm proceeded serially along the data stream. Peter literally rewrote this 30-year-old decompression algorithm so that as soon as a modest number of characters has been received, decoded characters are computed and become available. Far, far before even the total message has been received! To my knowledge, this is a completely new development in compressed amateur radio expertise.⁴²

41 K0IDT: "Avoiding the demo question again. Prove that it's possible under normal band conditions for a remote station., and you conveniently left ARQ out of the equation. " <https://forums.qrz.com/index.php?threads/new-digital-petition-at-the-fcc-rm-11831.652589/page-181#post-5095819>

42 Link to early versions of SCS software; see SCS for updated versions:
https://qsl.net/nf4rc/Tech/PMONLZH1/PMON_lzh_1_0_2.zip



*Instruction Manual for on-the-fly Winlink Reader,
free software by SCS based on my initial effort,
but rewritten by actual software developers.⁴³*

This rewritten algorithm should have wide applicability to all the known systems that utilize compressed transfers. Although some persons have loudly proclaimed that WINLINK is "unique" in using compressed transfers and ARQ, nothing could be farther from the truth, and Han-Peter's development may improve monitorability and performance of

- FBB
- BPQ
- FLDGI/FLMSG (unclear if applicable)
- PAT
- WINLINK

This filing will go over:

1. An overview of the software initially written in five days to read WINLINK compressed messages, over which there had been years of bickering
2. Experimental results proving that the developed software is quite capable of monitoring compressed WINLINK factor transmissions.
3. Experimental results providing evidence that the proposed diversity receiving system would likely result in significantly more complete capture

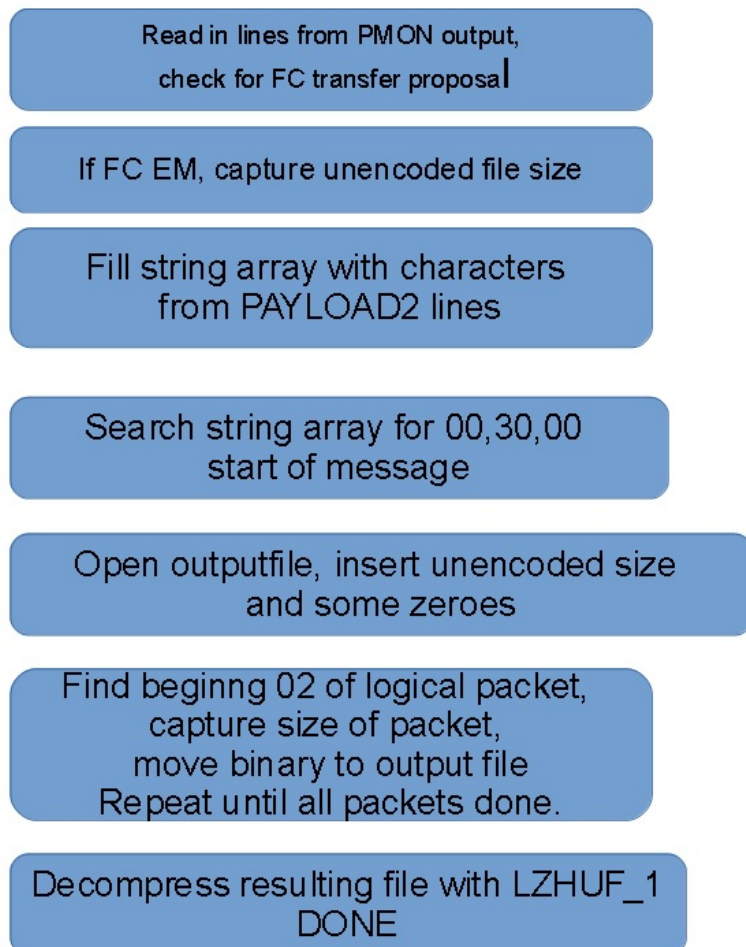
43 SCS: https://qsl.net/nf4rc/Tech/PMONLZH1/PMON_lzh_manual.pdf

4. Analysis of the evenness of the application of the faulty arguments made by various proponents, to other analogous compressed, ARQ systems.

Appendices contain the relevant experimental records.

SECTION ONE

AN OVERVIEW OF SOFTWARE WRITTEN TO ALLOW MONITORING STATIONS TO READ LZHUF_1 COMPRESSED FILES



Stylized Flow Chart of readcapture.c

The PACTOR DRAGON modem when placed in PMON mode (HEX 1 for my purposes) generates readable ASCII lines, with a set of ASCII lines for each radio packet received. The material read over the radio is in the PAYLOAD2 section. (See the Appendices for examples. An instruction manual for the SCS improved version is readily available.⁴⁴)

In order to gather up the packets received and put them in the proper order to go to the self-contained decompression routine (LZHUF_1, which really hasn't changed in 20 years) *one must merely understand how the packets were assembled at the transmitting end, and reverse that process.*

⁴⁴ https://qsl.net/nf4rc/Tech/PMONLZH1/PMON_lzh_manual.pdf

The packets were assembled with headers and associated information in accordance with Jean-Paul Roubelat's instructions for the B1 compressed file transfer protocol,⁴⁵ as amended by the WINLINK group and published as their B2F protocol.⁴⁶ **All of this information is readily available on web servers, and has been available for years and years, and has been reviewed by me in a recent FCC filing.**⁴⁷

Briefly -- The FC line explains that an encapsulated message will follow, and gives the uncompressed size of the file.

- The beginning of the data file is indicated by 0x00, 0x30, 0x00.
- Following this is the first logical packet, which begins with 0x02 and a one-binary-character number that indicates the number of binary numbers in that packet.
- Each successive logical packet follows with the same format, until the end of the compressed file, which is indicated by a 0x04 following the end of (the last) packet.

In order to reverse the process then, I merely wrote modular code to

- Capture packets from the modem and store them for later study
- Read the capturefile and repackage the information suitable for publicly available lzhusf_1 software

term.c

It took me twenty days to learn how to open the serial port and read a character from the modem. I was simply a rank beginning flailing. Finally the SCS people literally gave me about ten lines of c code that did *all of that*....and all I did afterwards was add to it the ability to put the characters out to a disk file ("capturefile") for storage.

readcapture.c

On August 20, 2019 I began working on this important piece of code. It took me five days to learn enough c, and write this code, and two of those were spent figuring out that the raspberry pi uses computer words of a different size than the IBM PC and thus needed a slightly better-written version of LZHUF. The key was that the raspberry couldn't decompress the same files that Huggins was handling with ease. Dan Planet had stored the solution in a small note written in 2009.⁴⁸

- First, read in a line from the stored disk file. *It took me quite a long time to figure out that one finds the end of lines by searching for either a carriage return or a linefeed....*
- Search for a Payload 2 line and then search it for the FC EM statement.

45 <http://www.f6fbb.org/>; click on Technical Info and pursue the information.

46 <https://winlink.org/B2F>

47 <https://ecfsapi.fcc.gov/file/10808597817982/ExParteCommunicationAug8.pdf>

48 Dan Planet: <http://www.danplanet.com/blog/2009/11/09/winlink-1988/>

- When an FC EM Statement s found, extract and store the **unencoded file size**, which is the first number that follows the long Message ID number.
- Now begin reading in successive PAYLOAD2's and storing them away in a very long string (character) array, so that you remove the "radio packet" framing of the material.
- Once the long string(character) array is finished, go back from the beginning of it --
- Open an output file, insert the stored size of the unencoded file size, littlest character first. In my case, I only used two binary characters; that was sufficient for a huge message (64kbytes). Then write out 6 additional 0's. That gets your outputfile set up properly for lzhuf.
 - Find the beginning of a logical packet marked by 0x02.
 - Next number is the number of data bytes in that packet.
 - Read them In, and **store them in the outputfile**
 - Repeat for the next logical packet and so on.

DONE.

FINAL TASK:

Take the outputfile and call the stand-alone LZHUF with it, and out pops the message. (You can use any version appropriate for your computer.)

```
lzhufuniv8 d outputfile reconstructedmessage.txt
```

Use any reader you like to read the reconstructedmessage.txt Notepad or your favorite word processor will work fine.

Editorial Comment

I put in the rather significant effort to create this software for multiple reasons. I knew the WINLINK transmissions were not encrypted. Reading them appeared to be the speediest way to end what I viewed as a fruitless 19-year bicker fest. Further, the goal of being able to read WINLINK system transmissions appeared *worthy and useful* to me.⁴⁹ In my opinion, the availability of the "winlink viewer" did more positive for WINLINK than anything they have ever done, and made it easy to demonstrate dramatic cleaning up of their user base.⁵⁰ I happen to know that this opinion is not unknown among the Winlink Development Team.

49 And I have made my own recommendatios to provide openness in Amateur Radio future systems developments. See: <https://ecfsapi.fcc.gov/file/10830048730238/FreeSoftwareToReadWINLINK.pdf>

50 Gibby: <https://ecfsapi.fcc.gov/file/10822196770221/ReAnalysisOfWinlinkObjectionableMessages.pdf>

It bothered me greatly that people would bicker for 19 years rather than doing the small amount of work required to build this. It turned out that for at least one group, the idea of distributed, networked receivers had never occurred, and there was a pessimistic belief that there might be insignificant results.

When I started writing this software, **I could not even remember how to write a for loop, or a printf statement. Every command that I used, I had to look up in a C-textbook and try.** I explain these items to demonstrate how easily a real programmer might have solved this 19-year argument. I had no editor at first that would even keep track of matching braces for me; I wrote using either the raspberry pi built-in free text editor or the Windows NOTEPAD application. I compiled using the free gcc compiler -- the only compiler I had! I would write lines of code on the windows laptop because the raspberry pi keyboard was misconfigured and I couldn't figure out how to fix it properly. I learned there was a compatible gcc compiler for Windows and used that. When I finally got a piece of code that would compile on the windows laptop without errors, I would email it to myself and then pick it up on the raspberry pi (I still don't understand the mount command and reading flash drives on a raspberry pi). Recompile it on the raspberry, run it, read through all the printf outputs to find out what error I had made this time....and return to the Windows laptop to begin fixing. My average time to find and fix one mistake was approximately 1 hour. I made scores of mistakes because I was an utter beginning trying to write this code, since no one else had. I gradually relearned the C-language in the process and began to make fewer mistakes. I always wondered by the experts hadn't written this simple program.

After the wasted two days figuring out that I needed a processor-independent lzhusf_1 -- I named mine lzhusfuniv8 (the 8 indicating there were 8 characters in the first part of the file before the data begins). On Sunday August 25, at 8:30 I decoded the very first Winlink email.

I think it is rather obvious to any person with the ability to understand packetized radio communications, and the B2F protocol, and some grasp of computer programming, that there is nothing magical or difficult at all about getting this to work. Huggins did it with simple keyboard cut and paste! This is a fairly simple protocol, and if you get the steps done properly, **it basically will work.** This process is carried out flawlessly tens of thousands of times every month by official WINLINK code.....all I did was create a small separate set implementing the same decoding, but on PMON captured text, instead of the normal modem output. Because I am such a beginner at software, I really couldn't even read John Wiseman's elegant code. I didn't even know what some of the operators he used were! After several hours of review, I concluded I would never figure it out. A real programmer might have viewed it as a gold mine.

My problem was that I'm NOT a computer programmer and it took me some time to understand that there were "logical packets" created by the B2F protocol....and these were then re-chopped up and sent as "radio packets" that could be of any size based on the particular SPEED LEVEL chosen by the modems. This was much more of a problem for a beginner programmer than it was for the DRAGON modem. **The modem flawlessly followed the changing packets by reading the headers and instantly knowing the speed level.** Me, the beginner programmer, had to finally figure out that it

was a two-step process to pull information out of the RADIO PACKETS, insert into a string array, and then search to identify the LOGICAL PACKETS. A real programmer would have done that in minutes. Took me *hours*.

My original working code, of course, had multiple bugs. Over the next several days, I tested it with more and more captured messages and gradually fixed the bugs until it was reasonably stable. Then I turned it over to Hans-Peter Helfert and he first compiled it for the WINDOWS system, and later rewrote all of it, I believe....which was definitely an improvement over my beginner-code.

Date	Code
August 25th original code	https://www.qsl.net/nf4rc/Tech/RaspberryPiWinlinkDecoder/readcapture825a.c
Sept 3 code	https://www.qsl.net/nf4rc/Tech/RaspberryPiWinlinkDecoder/0903/readcapture903a.c
Sept 6 code	https://www.qsl.net/nf4rc/Tech/RaspberryPiWinlinkDecoder/0906/readcapture0906b.c
Sept 7 code	https://www.qsl.net/nf4rc/Tech/RaspberryPiWinlinkDecoder/0907/readcapture0907a.c

SECTION TWO

EXPERIMENTAL RESULTS PROVING THE DEVELOPED SOFTWARE IS QUITE CAPABLE OF MONITORING COMPRESSED WINLINK PACTOR TRANSMISSIONS⁵¹

At least two people had set some level of expected performance for an acceptable solution:

EVALUATION STANDARDS	
K0IDT	"You won't need a linear Phil, the FCC has already stated "an amateur station hearing a message being able to determine whether message violate the amateur service rules". Even the QRP guys are safe if no one hears them. " ⁵² [emphasis original]
N2RJ	<p>Gordon,</p> <p>If someone decoded a message over the air, then that means that they have a software package to do it. If such package exists, I'd like a proof of concept to show that it indeed can be done. The burden of proof is on those who make the claim that it can be decoded, not on me. This is not about theory. I know about the theory. The problem is that the theory hasn't been demonstrated under the conditions for someone to effectively monitor these messages:</p> <p>With a stock modem in a new box from a reliable third party (ham radio dealer) OR (better yet) a sound card and general purpose computer Over the air, tuning in to a random transmission on any band Not being in the same room in a controlled lab environment WITHOUT having to transmit and ask for repeats</p> <p>These are the conditions, and nobody really has demonstrated anything under these conditions.</p> <p>My software development skills are good enough. My time is scarce. If you guys can do it, then by all means, you should. I've been saying this over and over - if it can be done, then do it so we can just get on with it and put that argument to bed.⁵³</p>

Problematic Evaluation Scenario

By far, the largest problem I faced in testing this software in a realistic environment was completely unexpected and never mentioned by the two standard-setters listed above --- **There just are almost no pactor modem transfers to be monitored!** For 24 hours I ran two unattended monitoring sessions on 80 meter frequencies (two receivers, different frequencies) -- *and caught NOTHING*. At that rate, conducting a suitable trial could take months to years.

51 See later in this disclosure for discussion of FLDGI/FLMSG, which are not (yet) known to meet this standard.

52 K0IDT: <https://forums.qrz.com/index.php?threads/new-digital-petition-at-the-fcc-rm-11831.652589/page-182#post-5096296>

53 N2RJ: <https://forums.qrz.com/index.php?threads/huggins-did-it.667817/page-11#post-5149028>

Faced with that result, I concluded that it would be necessary to arrange for some form of email transfers to happen, and between stations equipped with PACTOR modems. *On dry land, very few stations actually have PACTOR modems, for all the argument about them.* In my county I know of only three -- my amateur gateway, my SHARES gateway, and just recently, the Emergency Operations Center. **No one else in my County at the time of these tests even owned a modern PACTOR modem.** The most likely stations to have PACTOR available are the HYBRID GATEWAYS in the WINLINK Hybrid system, because they *require* that modem⁵⁴, and there are roughly 30 of them in the entire USA. Thus my opportunities for capturing random emails were *quite limited*, but with some effort I was able to cause transfers to happen.

The Monitor Scenario was chosen to attempt the best possible match to what any person wishing to truly test this monitor concept would wish. I wanted to find out if this would work. Although I tried several different iterations, the following was the most successful automated method and illustrates the protections taken to insure it was a useful test:

1. All email transfers were initiated FROM N5TW approximately 912 miles from the monitor location and the intended recipient (KX4Z).
2. The Monitor Station was not in any way involved in the transfer. (Not "connected.")
3. The Monitor Station didn't have any knowledge or information as to the callsigns of either station involved in the transfer connection; it simply was on frequency and running PMON HEX 1, PMON VERBOSE 3, PMON START.
4. At the beginning, I had no preconceived idea of which remote gateway would be monitored at the beginning. It turned out that N5TW was one of the ONLY stations I could even HEAR at the time points I was able to do my testing, so that became my standard. N5TW would generally have a reasonably strong signal on 20 meters, but never above S9. There was considerable QSB (fading) on some efforts. On the transfers that actually were captured, I didn't even know precisely when it would occur --- just roughly 15 minutes from the previous one, because I had set the gateway to check for CMS traffic approximately every 15 minutes. It actually ended up being rather variable, and I don't know why since I wasn't able to monitor it. Thus, I was truly a monitor station, just sitting on a frequency and hoping for traffic.
5. ***It is important to recognize that the transmitting station being monitored was NOT the 9-mile KX4Z, but was instead the 912 mile N5TW.*** (In various experimental sessions, I reversed which station did what but always the transmission being monitored came from the station several states away.)

54 Likely for legacy reasons: the modems are reliable, off-load work from the computer, interface easily via a serial port, and all improved models of this particular technique are backwards-compatible with previous models. That has not at all been the case, for example, with VARA.

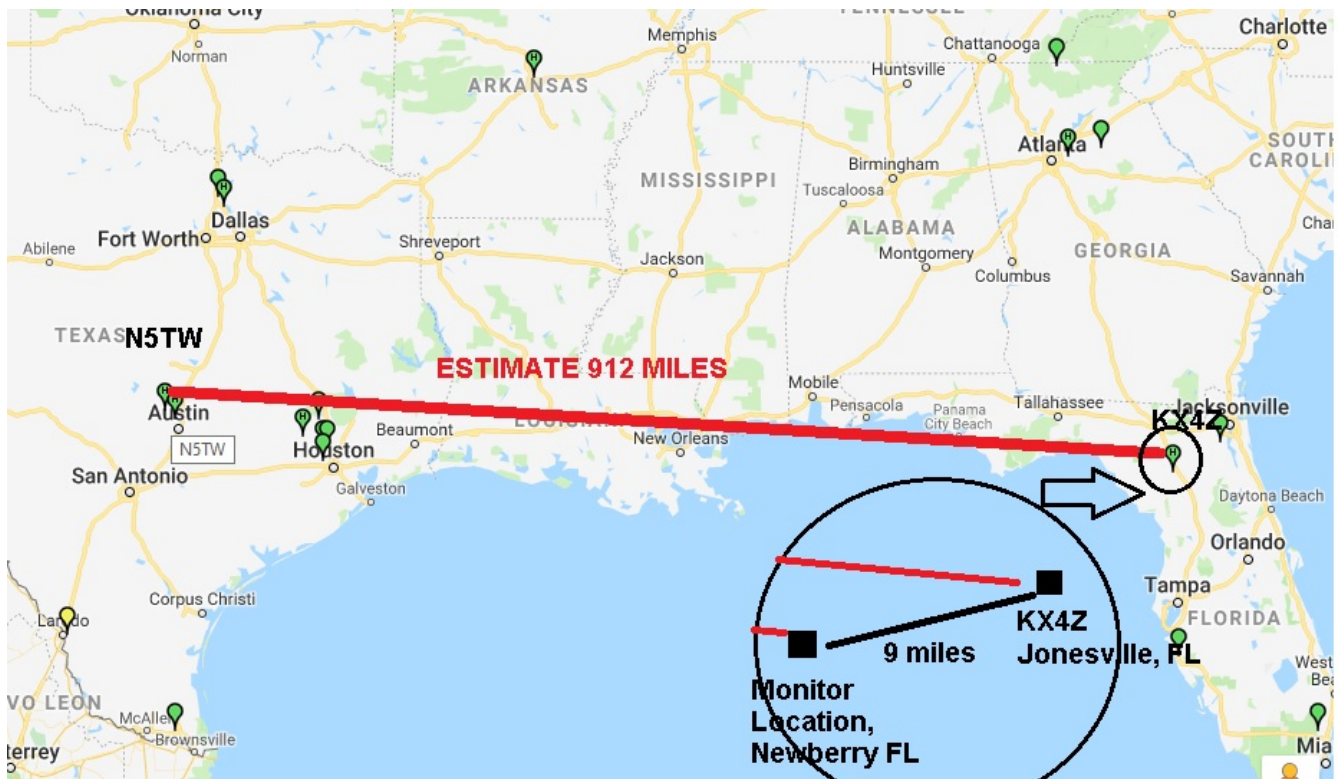


Illustration of the signal paths (RED). There were never any communications between Monitor and Connected station. The task pursued by each location were variable by day of experiment. This drawing's legends pertain to the Sept 10 experiments. The only connected stations were N5TW and KX4Z involved in radio transfer; the monitor never had any advance knowledge of anything except the frequency. All emails monitored were transmitted from N5TW, approximately 912 miles distant.

Most experienced users of WINLINK in my area know that it is much easier to make a connection after dark. The possible number of "green" stations in the WINLINK Propagation tool vastly expands at nighttime. This is likely do to the waning D-layer after the sun goes down.

As it turned out, I was unable to carry out nighttime tests at the bustop ParkNRide. The problem was excessive frying-pan noise.. There was a sodium vapor lamp-post just 10 yards from my antenna and monitoring location, and I suspect this was the culprit. I couldn't hear anything. So I had to be satisfied with DAYTIME (in my estimation, more difficult) tests.



Monitoring Station Location. Wire vertical came down in the palm tree. Blue box visible at the bottom of the palm is the 1:49 end-fed balun in a Carlon electrical handy box.



Awkward but usable Monitoring Station.

Because this was 20 meters and I was approximately 9 miles from the "initiating station", I could generally hear the WINLINK packet calls initiated from KX4Z gateway station, running RMS_RELAY (the standard gateway software). They were NOT strong. Getting those calls to occur took some

effort. For one or two sessions, I was able to set the home station to do automated "CMS Checks" and search for email to be delivered to me. For another session, I made some mistake and that didn't work, so an Extra Class neighbor drove over and manually commanded WINLINK EXPRESS to call stations for me. That effort was the unsuccessful evening effort when I simply couldn't hear anything for the RFI.

Connect attempts begin with a "ROBUST CALL"

```
###CONNECT: [Robust Call: N5TW]
pú
```

```
###CONNECT: [Robust Call: N5TW]
pú
```

```
###CONNECT: [Robust Call: N5TW]
pú
```

and then proceeds through the standard B2F protocol:

FC EM 00HVWTJJHS1W 588 432 0	Proposal to transfer, using Protocol C, an Encapsulated Message with the given ID#, uncompressed size 588 (decimal) and compressed size 432.
F> 4B	Various bits of handshaking that I don't fully understand and were not germane to me monitoring the emails.
65, 73, 74, 00, 30, 00, 02, FA, 6F, E7, 4C, 02, 00, 00, EC, F5, 7A, 1C, 6D, 67, 6F, 79, D4, F1, 78, FC, 1D, 6B	..00,30,00 --- (hexadecimal) -- indicator of beginning of the compressed message. 02- start of first logical packet FA - hexadecimal (250 decimal) -- there are 250 bytes of material following in this logical packet
....02	02 -- start of next logical packet (next 2 characters gives size of that logical packet)
04 (after end of logical packet)	End of message packets.

Capturing the Received Text to Disk

Now that I had a Windows version available from Hans-Peter Helfert or could move text from one computer to another, I used my Windows laptop for capture. I utilized a freeware program, COOLTERM on a laptop windows computer to capture the traffic to disk (at that time, Hans-Peter Helfert had not yet finished his amazingly improved software). I then could take the disk file and analyze it with either the raspberry or the windows software and see what I had captured.

RESULTS

RECORD OF EXPERIMENTAL SESSIONS (SYNOPSIS)

DATE	Attempt		Result						
Sept 8	<table border="1"> <thead> <tr> <th data-bbox="298 396 544 447">Location</th> <th data-bbox="544 396 800 447">Assignment</th> </tr> </thead> <tbody> <tr> <td data-bbox="298 447 544 537">ParkNRide, Newberry</td> <td data-bbox="544 447 800 537">Live initiator of email downloads</td> </tr> <tr> <td data-bbox="298 537 544 693">Home Station, Jonesville</td> <td data-bbox="544 537 800 693">Supervised monitoring (capturing packets)</td> </tr> </tbody> </table>	Location	Assignment	ParkNRide, Newberry	Live initiator of email downloads	Home Station, Jonesville	Supervised monitoring (capturing packets)	<p>First attempt at monitoring distant emails. On this day, I was trying to initiate email transfers by calling distant RMS's from the Newberry ParkNRide location, and having Leland AA3YB manage frequencies and free-running computer capture of modems in Jonesville</p> <p>The full blow-by-blow of this initial pilot session can be viewed here (this is a synopsis): https://qsl.net/n/nf4rc//Tech/RaspberryPiWinlinkDecoder/0908/CAPTUREPRACTICE001.pdf</p>	<p>A very frustrating beginning. I was not able to make ANY working contact that allowed the home stations to capture any significant number of packets -- just not enough signal on 40 meters.</p> <p>We switched to 20 meters, tried N5TW and a SUCCESS. See Appendix 1 for the email perfectly captured. My notes suggest that I tried other emails but never fully analyzed them after that success.</p> <p>TRUCK: It may have helped that the truck overheated and had to be shut off. I discovered on a later day's testing that there was enormous ignition noise from the truck. I don't know why I didn't comment or notice this in the record of Sept 8th testing. Perhaps the ignition system is variable?</p> <p>Conclusion from the first day: SIGNAL LEVEL is the key. If you cannot get enough signal for the pactor to read it, nothing will work.</p> <p>This hour's work suggested that the Jonesville station had inferior signal situation to the ParkNRide--when the truck was shut off!!!</p>
Location	Assignment								
ParkNRide, Newberry	Live initiator of email downloads								
Home Station, Jonesville	Supervised monitoring (capturing packets)								
Tue Sept 10 (1st trial)	<table border="1"> <thead> <tr> <th data-bbox="298 1442 544 1493">Location</th> <th data-bbox="544 1442 800 1493">Assignment</th> </tr> </thead> <tbody> <tr> <td data-bbox="298 1493 544 1583">ParkNRide, Newberry</td> <td data-bbox="544 1493 800 1583">Live Monitor</td> </tr> <tr> <td data-bbox="298 1583 544 1766">Home Station, Jonesville</td> <td data-bbox="544 1583 800 1766">Receiving station of potential radio- only emails imitated by N5TW</td> </tr> </tbody> </table>	Location	Assignment	ParkNRide, Newberry	Live Monitor	Home Station, Jonesville	Receiving station of potential radio- only emails imitated by N5TW		<p>The system to have emails sent never worked.</p> <p>There were just no pactor messages calls ever made.</p>
Location	Assignment								
ParkNRide, Newberry	Live Monitor								
Home Station, Jonesville	Receiving station of potential radio- only emails imitated by N5TW								

	90 minute monitoring attempt hoping to get N5TW to send Radio Only email for NF4RC to gateway KX4Z							
Tue Sept 10 (2nd trial)	<table border="1"> <thead> <tr> <th>Location</th> <th>Assignment</th> </tr> </thead> <tbody> <tr> <td>ParkNRide, Newberry</td> <td>Live monitor</td> </tr> <tr> <td>Home Station, Jonesville</td> <td>Automated CMS checking to instigate email downloads from N5TW</td> </tr> </tbody> </table> <p>Switched to automated q15 minute CMS checks by KX4Z -- worked! N5TW responded each time and initiated an email</p> <p><u>Packet Capture</u> Note that I intentionally activated PMON PACKETS 1 -- which allows PMON to present the repeater Packets (RQ::1 also). This information allowed the discussion within the Diversity Receiver Section</p>	Location	Assignment	ParkNRide, Newberry	Live monitor	Home Station, Jonesville	Automated CMS checking to instigate email downloads from N5TW	<ol style="list-style-type: none"> 1. Perfect capture on first email. (See Appendix 2) 2. Near-perfect capture on 2nd email (See Appendix 3) 3. Washington's Farewell address (37kbyte uncompressed) made it only a small distance before a packet was lost (See Appendix 4) Severe fade in signal strength perhaps every 2 minutes to unnoticeable signal on the S-meter -- during that episode the PACTOR lost the signal. (But see later discussion in the Diversity Receiver Section) . (Representative ICOM S-meter calibration in Appendix 6)
Location	Assignment							
ParkNRide, Newberry	Live monitor							
Home Station, Jonesville	Automated CMS checking to instigate email downloads from N5TW							
Sept 12	<table border="1"> <thead> <tr> <th>Location</th> <th>Assignment</th> </tr> </thead> <tbody> <tr> <td>ParkNRide, Newberry</td> <td>Live monitor</td> </tr> <tr> <td>Home Station, Jonesville</td> <td>Live WINLINK EXPRESS contacting gateway to download messages.</td> </tr> </tbody> </table> <p>Nighttime attempt 8 PM on 40 meters</p>	Location	Assignment	ParkNRide, Newberry	Live monitor	Home Station, Jonesville	Live WINLINK EXPRESS contacting gateway to download messages.	<p>Unable to catch more than a smattering of packets through the frying pan RFI noise. Unable to receive signal. The sodium vapor streetlamp in the ParkNRide 10 yards away from my antenna is the likely reason Trip was a bust.</p>
Location	Assignment							
ParkNRide, Newberry	Live monitor							
Home Station, Jonesville	Live WINLINK EXPRESS contacting gateway to download messages.							

Conclusion: In general, if I could HEAR the packets and see something on the S-meter, my monitor station could read at least a portion of the email, and more often than not, the entire email. These are only limited experiments, but far more successful than I expected! The PACTOR modem is truly amazing to watch. Only when the S-meter went completely to ZERO in severe fading, and I couldn't hear the signal, did I lose packets. It was really amazing.

Even more so, when the results of the next Section, on diversity receiving preliminary data, are reviewed.

Because of the sodium vapor lamp I was never able to do any monitoring in the evening, but the results above were so outstanding that I concluded it was of lesser importance to continue the monitoring sessions. The completion of Hans-Peter Helfert's on-the-fly decoding system convinced me that this was now a free commercial product, a working system, and little additional proof was needed from me. Users could then provide post-marketing feedback to a real vendor to see any future improvements.

CONSEQUENCE OF THIS ADVANCE

Numerous writers had variously requested or demanded this kind of software.^{55 56 57 58} Now they have it, for free. Some claimed that without it, the amateur waves were not safe, the security of the nation was in doubt, the future of amateur radio clouded. So there should be a unanimous round of applause to hear that it exists and works -- even if only the earliest versions, right? Amateur radio can now resume normal growth, the nation is now safe from WINLINK-email-based surreptitious attacks, and so forth.

- **The 19 year argument over reading WINLINK should be over, right?** These results can be quickly ported for ARDOP and WINMOR at the least, based on their published interfaces. See a later section to realize that there are other fish that have been ignored while frying WINLINK for 19 years.....

55 K0IDT: "Where's the decoder? Where's the decoder for compressed ARQ Winlink modes? How hard is it to copy, reassemble the compressed packets, and get readable text from a typical Winlink transmission? "
<https://forums.qrz.com/index.php?threads/wide-bandwidth-digital-danger.639948/page-31#post-4924493>

56 K0IDT: "Encryption is not in the petition, never used the word. A compressed message is obscured if there are no available means to decode the compression. The petition simply asks a decoder be made available. "
<https://forums.qrz.com/index.php?threads/new-digital-petition-at-the-fcc-rm-11831.652589/page-174#post-5085217>

57 K0IDT: "Now do it with a Winlink transmission at some distance from you on say 40m. Let us know how that works out. Geographic separation will present more real world conditions. Should only take a little while, we'll wait. "
<https://forums.qrz.com/index.php?threads/new-digital-petition-at-the-fcc-rm-11831.652589/page-104#post-5030385>

58 N2RJ: "I would be interested in that code. Perhaps we can set up a test at W1AW where we tune in to a random signal on 40 meters and decode the message. If we can demonstrate this proof of concept in real world conditions (not in a controlled environment) then I'd be interested. This must be done with a modem new in box bought off the shelf from a random amateur radio dealer of our choosing. "
<https://forums.qrz.com/index.php?threads/huggins-did-it.667817/page-10#post-5148982>

- **The argument over illegal practices is now moot** after the data presented on the incredible clean-up, right? No one has even attempted to refute the published data, and the opponents of WINLINK were the ones who did the cleanup!⁵⁹
- **The argument over Interference, at least from WINLINK 97.221(c) stations is OVER, right? No one has even attempted to refuse the statistical data presented.**⁶⁰ Based on the data actually gathered. ARDOP in its lowest speed appears to be *narrower than RTTY*....if bandwidth is the answer, have everyone use the lowest speed level.

Well, we will now get to find out.

59 <https://ecfsapi.fcc.gov/file/10822196770221/ReAnalysisOfWinlinkObjectionableMessages.pdf>

60 <https://ecfsapi.fcc.gov/file/10408063816674/FCCRM11831-2.pdf>

SECTION THREE

EXPERIMENTAL RESULTS PROVIDING EVIDENCE THAT THE PROPOSED DIVERSITY RECEIVING SYSTEM WOULD LIKELY RESULT IN SIGNIFICANTLY MORE COMPLETE CAPTURE

There has been a very natural and steady development and advancement of these monitoring capabilities.

Very Limited First Experiment

My first proof that WINLINK is not encrypted was a simple but clever experiment that exploited the ability to "spoof" a winlink receiver callsign by a transceiver without the actual ability to transmit, but -- if luck allowed -- maintaining synchronicity with the intended recipient. With quite a few tries, successful results were occasionally found. That of course proved that the transmission was not encrypted, since the 3rd station had no information other than that sent over the same radio waves. Although the experiment was explicitly explained and its limitations carefully explained both in the version made available to the FCC⁶¹, and in the much longer version on Amazon⁶², there were commenters who apparently misunderstood the experiment, or appeared to misconstrue its claims improperly.^{63 64 65 66}

Current Monitoring System Development

The current work is the real beginning of actual monitoring software/system suitable for monitoring WINLINK transmissions, should that be desired. This work applies specifically to PACTOR transmissions, but the extension to ARDOP and WINMOR requires only rewriting the capture portion, not the packet handling. Because of the structure of the WINLINK system, all techniques are utilized exactly the same way -- merely as conduits from electrical to radio wave.

-
- 61 Gibby, "Obviously this is only a proof of concept test – but it was done completely over amateur radio frequencies, in real-time, over the air, without any use of the internet at all." <https://ecfsapi.fcc.gov/file/10410170249078/FCCRM11831-4.pdf>
- 62 Gibby, Amazon paperback: <https://www.amazon.com/dp/1080563199> See especially page 6-10, and note that at the time of that writing, I still believed the common myth that one could only get recognizable output from lzhuF if all the packets were received -- dispelled by Huggin's work.
- 63 Kolarik; "And despite the bogus "proof" floating around those won't decode P3, as used by Winlink, randomly over the air. You still need 100% of the packets to decompress." <https://forums.qrz.com/index.php?threads/arri-report-no-consensus-reached-for-fcc-on-“symbol-rate”-issues.666183/page-22#post-5137149>
- 64 Kolarik: "What record? The bogus proof of concept that was presented earlier in the thread? That demo could have been done with a cable between the radios. I don't call two radios side by side an adequate demonstration of off-air-monitoring." <https://forums.qrz.com/index.php?threads/new-digital-petition-at-the-fcc-rm-11831.652589/page-181#post-5095858>
- 65 W6EM: 1. Your experiment is bogus. You did not truly emulate conditions that exist in a usual, HF over the air QSO. A cantenna dummy doesn't reproduce things like fading, multipath, scatter, etc. Why didn't you and others do this 10 year ago? Because you all knew that you couldn't and now you took it upon yourself, on behalf of Winlink, to contrive a fake example with perfect channel knowledge for interception over the air. Who do you think you're fooling? <https://forums.qrz.com/index.php?threads/new-digital-petition-at-the-fcc-rm-11831.652589/page-116#post-5037279>
- 66 KA4DPO: 1. As many have shown you, Your experiment is bogus, it was staged, and not a true over the air ham test. Why didn't you and others do this 10 year ago? It's because you can't, and need to contrive a fake example with perfect channel knowledge to manufacture an interception over the air. Who do you think you're fooling? <https://forums.qrz.com/index.php?threads/new-digital-petition-at-the-fcc-rm-11831.652589/page-115#post-5037158>

Proposed Diversity Monitoring System

A diversity receiver system with multiple receivers at different locations, is one possible solution to the problems of poor signal reception, interference (QRM) and high frequency fading (QSB). I have proposed this solution for the WINLINK monitoring issue.^{67 68 69} In order to further test my theory of the ability to take advantage of diversity receivers, during my field tests, I set PMON PACKETS 1, which allowed the Dragon modem to report to me when it saw repeated, identical packets. These are **always** the result of an ARQ not-acknowledgment by the intended receiver (or the lack of an acknowledgment within some time limit) and then a re-send of the same packet by the transmitter station ("In Sending State"). These packets are detected by the Dragon not by some special bit in the header, but more simply by two identical packets with same CRC information.⁷⁰

The existence of these packets gives a monitoring station a gift -- a 2nd chance to recover information if the monitoring station missed the original packet. As has been explained before, in general, if the monitoring station has a better signal to noise ratio than the intended recipient, there will be luxurious arrival of many repeated (and unnecessary) packets to the monitoring station, resulting in a more complete capture. If the situation is reversed, and the monitoring station is missing more packets than the intended recipient, the monitoring software will end up going wanting at some point.

However, for me in these current tests, there was an additional benefit -- the recognition of these repeated packets proved positively that the intended receiver station had missed a packet. There may be additional packets missed by the intended recipient, not recognized in my captures in the event that the monitoring station also missed them, but the RQ: 1 packets (repeated packets) provide a lower bound of the count of the packets missed by the intended recipient.

Counting the packets missed by the monitoring station is easy -- observe the **modulo-4 packet counter FRCNT** for skipped numbers in the repeating sequence [0,1,2,3]. (See published SCS documents for fuller understanding of the packet header information.) FRNR provides something different; a simple monotonically increasing counter of frames presented by the PMON software.

```
###STATUS: SL: 4, CYC: 0, RQ: 0, REV: 1, LSB: 0, dF: -23.1, CRC: F050, FRCNT: 0, FRNR: 142
```

CHANCE TO TEST THE DIVERSITY THEORY

Unexpectedly, the experimental conditions during the transmission of the 36,000 (uncompressed) George Washington Farewell Address allowed me to study the possibilities of a diversity receiver monitoring system. During that email transmission on 20 meters from 900+ mile away station N5TW, there was very significant fading (QSB) of the signal. Every couple minutes or so, the signal would just begin a fade over several seconds down to un-readable, no indication whatsoever on the receiver S-meter--and the come back to normal strength. As a result of this fade, my capture by a single receiver of this email was limited to an initial segment of the email (See Appendix 4).

67 See p 6ff here: <https://www.qsl.net/nf4rc/2019/SpyingOnWINLINKV2.pdf> or in the published Amazon text: <https://www.amazon.com/dp/1080563199>

68 See p11 in <https://ecfsapi.fcc.gov/file/10730701023399/ResponseToRappaportJuly24Filing.pdf>

69 See p4 in <https://ecfsapi.fcc.gov/file/10722131064325/REPLYtoCarsonExParteFilingProposal.pdf>

70 Personal Communication, Hans-Peter Helfert SCS.

However, the data record from PMON, understanding the above information about the FRCNT and RQ:1 allows one to infer what the OTHER receiver (9 miles away, and actually involved in the connection) was receiving -- you can see when THAT receiver missed a frame, because the monitoring receiver then picks up the repeated (identical) frame. This allows a measurement of the missing frames, on EACH RECEIVER. And it turns out that they were temporally disparate--- when one station was missing the signal, the other station 9 miles away HAD THE SIGNAL, and vice versa. This sequence repeated multiple times throughout the transfer, and gives solid evidence that a diversity receiving system would significantly improve the total capture success rate.

Carrying out this analysis for packets known-missed in the long transmission of the George Washington farewell address yields the following information:

ANALYSIS OF MISSED FRAME BY RECEIVING LOCATION,
GEORGE WASHINGTON FAREWELL ADDRESS

Frame Number (FRNR) reference (monitoring capture)	Intended Recipient	Monitoring Station	Comment
76	Captured	Captured	Beginning of data
77-81	Captured	Captured	Total of 6 frames captured by monitoring station
	No indication that the intended recipient missed this frame	Missing FRCTL 3 because the counter went from 2 directly to 0	Intended recipient got the frame missed by the monitoring station
82,83	required a RESEND	captured both transmissions	Monitoring station caught the original frame that the intended recipient missed on 1st try--and then got the resent also.
84,85	required a RESEND	captured both transmissions	Monitoring station caught the original frame that the intended recipient missed on the 1st try.--and then got the resent also.
86,87	required a RESEND	captured both transmissions	Monitoring station caught the original frame that the intended recipient missed on the 1st try--and then got the resent also.
88,89	required a RESEND	captured both transmissions	Monitoring station caught the original frame that the intended recipient missed on the 1st try--and then got the resent also.
90, 91	captured	captured	

	apparently captured	Missed frame -- FRCNT 2 is missing	No indication that the intended recipient missed this frame
92-95	captured	captured	
	apparently captured	Missed frame -- FRCNT 3 is missing	No indication that the intended recipient missed this frame.
96-99	captured	captured	
100, 101	required a RESEND	captured both transmissions	Monitoring station caught the original frame that the intended recipient missed on the 1st try--and then got the resent also.
	END OF FILE	END OF FILE	
END OF 36,000 CHARACTER GEORGE WASHINGTON FAREWELL ADDRESS			

The quite surprising conclusion drawn from these data, is that **if one had access simply to the frames captured by both these two receivers, 9 miles apart, one would have been quite likely to reconstruct the entire 36,000 character George Washington farewell address.** Apparently because they were separated in space by 9 miles, the fading (severe QSB) was temporally disparate at these two stations -- so when one station's reception faded to zero, the other station still had a capture; and then the reverse happened. You can see this cycle repeat throughout the multiple packets of this transmission.

You can also see the modems switch from short packets to long packets (3.75 seconds) and also the speed level changes that were taking place and were being accommodated by the monitor station and the intended recipient, precisely as Hans-Peter Helfert had explained.

This is my first and obviously fascinating evidence that the diversity receiver system would work, and is worthy of further rigorous evaluation.

Peter Helfert has pointed out the incredible rate of improvement that I'm just seeing the first glimpses of:

*Well, diversity is a **very efficient** way to improve the residual packet error rate.*

*The probability that a packet is **not** received at location A simply multiplies with that probability at location B...*

*So, for example, if the probability that a packet will **not** be received at location A is 30 %, and 20 % at location B, you have an overall probability of $p_diversity = 0.2 * 0.3 = 0.06$ that the packet will not be received by the 2 station diversity system. Diversity improves the packet error rate to 6 %, though the reception quality was quite poor at location A as well as at location B...*

*That also works for more than 2 stations of course, and the $p_diversity$ **improves***

very rapidly (exponentially) with increasing number of independent monitoring locations.⁷¹

71 <https://forums.qrz.com/index.php?threads/huggins-did-it.667817/page-65#post-5198249>

SECTION FOUR

ANALYSIS OF THE EVENNESS OF THE APPLICATION OF FAULTY ARGUMENTS MADE BY PROPONENTS, TO OTHER ANALOGOUS COMPRESSED ARQ SYSTEM

The criteria used by many proponents of RM-11831 or similar initiatives to determine which systems are "encrypted" or "effectively" encrypted are engineeringly faulty, because true encryption requires some secret key or keys. It is inconceivable that a publicly distributed piece of software would contain or be able to sufficiently conceal such a key, rendering the security null. There would need to be a way for the users to add and transact some sort of secret. Persons familiar with PGP4 are familiar with the concepts of public/private encrypted systems. WINLINK and other similar applications have none of this.

Examples of criteria for the usage of the word "encrypted" or "effectively encrypted" or "obscured" used by various writers.

Writer	Quote
KA4DPO	"Get over it Gordon, PACTOR is a loser, it is message private by design, that = encrypted to almost every single ham on the air. You can call it message private, low probability of intercept, variable symbol rate coding, and half a dozen other things but at the end of the day it still boils down to, the overwhelming majority of amateurs, the FCC, and other government agencies, can not decipher it. You had a nice run. By. ⁷²
John W. Long	Since PACTOR III content can only be read by the recipients and the sysop in real time only, but can not be decoded by anyone else, it remains an encrypted system. ⁷³
K0IDT	If it can't be monitored to determine if it's encrypted, it's the same as encryption. And I'm well aware of the possibilities and capabilities with "steganography". ⁷⁴
Mark Hoffman	I support RM-11831. Encrypted transmissions such as Winlink messages are by no means allowable under current FCC regulations. ⁷⁵
K0IDT	(defining a view of what constitutes "obscured" -- he was not claiming it was encrypted): "I'm not aware of any modulation that's encrypted, in the classic sense of the word, encoded yes but, it's not the modulation method, it's the payload carried by that modulation. Pactor, the modulation, can be copied by anyone with the modem, or certain software, but, a linked, compressed payload transmission is almost

72 KA4DPO: <https://forums.qrz.com/index.php?threads/huggins-did-it.667817/#post-5147778>

73 <https://www.fcc.gov/ecfs/filing/1041056168575>

74 K0IDT: <https://forums.qrz.com/index.php?threads/new-digital-petition-at-the-fcc-rm-11831.652589/page-180#post-5095161>

75 Hoffman: <https://www.fcc.gov/ecfs/filing/10420094129357>

	impossible for 3rd parties to copy. It's definitely a feature that "obscures" the meaning of the payload. " ⁷⁶
William Axelrod	1. National Security – Proprietary, wide band data communications that are actually or effectively encrypted without an available public decoder from autonomous transmitters on the amateur spectrum constitute a risk. If the broadcast cannot be "read" by others than those who have, or have purchased, the proprietary software effectively negates any opportunity to detect if any malefactors are using the media inimical to the safety of law and order or the security of the United States. ⁷⁷
KA4DPO	The answer is no. The transmissions are obscured. The system, as designed obscures the messages so the intent is in the design because there are a great many optional designs that can transmit the same information in the clear using software and radio equipment found in the majority of hamshacks. You don't have a leg to stand on. ⁷⁸
Rappaport	"...and the need for documented coding (e.g. avoidance of encryption through the use of open and published compression algorithms) ..." ⁷⁹
Rappaport	"Unfortunately, the Winlink system violates Section 97.113(a)(4)'s prohibition on encryption by predominantly relying on advanced communications modes – such as PACTOR 2, PACTOR 3, PACTOR 4, WINMOR, ARDOP, and VARA – that compress and, by extension, effectively encrypt messages or make them impossible to decode for meaning." Associated footnote: "See Reply Comments of Ron Kolarik, RM-11831, at 1 (July 17, 2019) (discussing numerous flaws with attempted demonstration that sought to prove amateur users' ability to intercept Winlink messages over-the-air); see also Reply Comments of Professor Theodore (Ted) S. Rappaport, RM-11831, at 6 (Apr. 29, 2019) (Winlink's combined use of fading channels and "differential encoding or compression . . . [creates] secure, effectively encrypted communications." " ⁸⁰

These statements must be carefully evaluated in light of what has now been factually demonstrated:

1. **All PACTOR communications can be read by other PACTOR devices of same or more recent vintage**, sometimes by more than one method! This is required by the German authorities. WA8DED hostmode is available, and on DRAGON series, the PMON command utilized in the software in this disclosure. (see PACTOR instruction manuals)

76 Kolarik: <https://forums.qrz.com/index.php?threads/new-digital-petition-at-the-fcc-rm-11831.652589/page-179#post-5095045>

77 Axelrod: [https://ecfsapi.fcc.gov/file/10503186789866/Rebuttal to Comments from Jame Whedbee.docx](https://ecfsapi.fcc.gov/file/10503186789866/Rebuttal%20to%20Comments%20from%20Jame%20Whedbee.docx)

78 KA4DPO: <https://forums.qrz.com/index.php?threads/new-digital-petition-at-the-fcc-rm-11831.652589/page-178#post-5093454>

79 Rappaport: [https://ecfsapi.fcc.gov/file/1022117362165/FCC PS 17-344 Reply to ARRL and Steve Waterman from N9NB.pdf](https://ecfsapi.fcc.gov/file/1022117362165/FCC%20PS%2017-344%20Reply%20to%20ARRL%20and%20Steve%20Waterman%20from%20N9NB.pdf) paragrph 13.

80 Rappaport: [https://ecfsapi.fcc.gov/file/10724035705944/NYU Ex Parte Filing - 07.24.19.pdf](https://ecfsapi.fcc.gov/file/10724035705944/NYU%20Ex%20Parte%20Filing%20-%2007.24.19.pdf)

2. One can easily recognize in the captures in the Appendices that all WINLINK transmissions use no internal compression of the PACTOR device (Type 8 frames⁸¹, controlled by the application, are used), and that **compression is the 30-year old and widely available and benign LZHUF_1**. *It is perhaps the most widely documented method of compression available in source code to the public*, and has been used in multiple amateur radio systems.

```
###PLISTEN: Level: 3:
###STATUS: SL: 3, CYC: 0, RQ: 0, REV: 0, LSB: 0, dF: 4.4,
CRC: 93AB, FRCNT: 1, FRNR: 11
###PAYLOAD1: LEN: 57, TYPE: 8
###PAYLOAD2:
65,73,74,20,34,00,30,00,02,FA,96,90,63,01,00,00,EC,F5,7A,1C,6D
,67,5F,9B,E0,EF,76,3C,5B,FC,0E,D5,EF,3B,C3,99,CB,61,FB,40,3E,3
8,58,3B,ED,E6,F7,8B,BB,B0,AE,A3,AF,A1,52,6C,F9

###PAYLOAD_END
```

Representative data packet, emphasis added.

3. **The application of 30-year old documents has allowed the creation of software sufficient to read winlink in 5 days of coding by a novice programmer.**

It is apparent that the words of Phil Karn, KA9Q in this missive, are true in this case:

The exact wording of 97.113 has changed over the years; I last paid really close attention to it way back in the 1980s when I was a member of the ARRL Digital Committee and these rules were being modified to allow "unspecified digital codes". We were very concerned that experimentation and advancement **not be held back by armchair lawyers mistaking a technically complex scheme intended to facilitate communications for a cipher (encryption scheme)**.

It's pretty obvious that our concerns were not unfounded⁸² [emphasis added]

The ASSERTION that simply because you are not able to read a line of text proves conclusively that it is obscured or encrypted is FALSE.⁸³

However, in this Section, **I propose to address whether the above flawed criteria were even applied with fairness to all amateur radio systems.** My knowledge base is definitely limited as to the

81 As explained previously, these are actually Type 0 unaltered frames from the application, but PMON reports them as "Type 8" if it detects characters outside the normal ASCII boundaries.

82 Karn: <https://forums.qrz.com/index.php?threads/new-digital-petition-at-the-fcc-rm-11831.652589/page-178#post-5093201>

83 To their credit, the ARRL understood this and corroborated my argument forcefully in their recent filing. See; [https://ecfsapi.fcc.gov/file/10918259487629/ARRL 16-239%2C RM-11759%2C RM-11828%2C RM-11831.pdf](https://ecfsapi.fcc.gov/file/10918259487629/ARRL%2016-239%2C%20RM-11759%2C%20RM-11828%2C%20RM-11831.pdf)

number of amateur radio systems utilizing any form of compression, as I'm less familiar with the voice codecs, however, claims that "WINLINK is unique"⁸⁴ in its compression have already been thoroughly debunked by me, and this list of systems providing some form of ARQ / compressed transmissions has been published:

MYTH #2: WINLINK is unique, being the only system in amateur radio that uses data compression and cannot be read if you miss a single bit or byte.

FACT: The first known usage of data compress in amateur radio (to me) was

#1 FBB Jean-Paul Roubelat who began in 1986 to develop a bulletin board system that utilized LZHUF compression, same compression as WINLINK. His still-extant original source code can be found on servers, dated 1999.

#2 WINLINK adopted his protocols.

#3 PAT-development further adopted those protocols and took them even farther, creating a new transfer proposal (the "FD" transfer) using gzip in a very similar fashion.

#4 BPQ and other winlink compatible developments utilize the LZHUF system.

#5 D-RATS (heyday approximately 2010, over D-STAR) also used binary compression, and all facts indicate it was.....LZHUF! D-RATS proponents had difficulty with LZHUF when computers went from 32 bit operating systems to 64 bit operating systems precisely because of this.

#6 FLWRAP uses a Lempel Ziv Huffman compression.

#7 FLMSG uses a compression algorithm.⁸⁵

Difficulties in Monitoring Compressed ARO Systems

It is likely that all amateur radio ARQ/compressed systems have certain similarities. All will transmit compressed, shortened forms of their files in a form that is **not immediately readable by the observer**. Some form of decompression will be necessary. Further, they will send this compressed data in packets of information and respond to NAK and ACK responses from the intended recipient appropriately with resends as needed.

The software systems when receiving such files handle them with ease. They capture a packet, add it to their internal storage of the message, and at some point in their cycle, decompress the message using a publicly-disclosed algorithm. There is no encryption of any sort known in any of the systems enumerated above.

However, consider the situation faced by an external monitoring station attempting to eavesdrop on that transmission:

84 W6EM: "For our Florida Medical Doctor, Gordo, KX4Z, who apparently has lots of unemployed time on his hands to banter about intentionally and uniquely obscured HF Internet Email service provider Winlink. " <https://forums.qrz.com/index.php?threads/winlink-posting-message-on-line.658595/page-8#post-5071460>

85 Gibby: <https://ecfsapi.fcc.gov/file/10906223525884/ExParteMyths.pdf>

1. The monitoring station is not part of the two connected stations.
2. The monitoring system may variably see TWO transmitters at times, rather than just ONE (as the intended recipient does) -- thus they can be confused as to whether the transmission is new information, or some response to previous information
3. The normal software package of the completely-legal amateur radio software application is not typically written for handling un-connected packets of information such as this. It is only written for handling data arriving according to a strict format, following a very precise process, of a back-and-forth handshake to initiate, and maintain the data transfer.
4. As a result it is very unlikely that the traditional amateur radio compressed/ARQ software package will be able to "monitor" in out-of-the-box shape.

This was precisely the problem pointed out by so many filers and commenters regarding WINLINK.

To solve that problem, I had to write a separate algorithm (now much further improved by Hans-Peter Helfert of SCS) to take these un-connected, free-flowing packets and properly handle them to feed the information to the publicly available decoding algorithm. As the reader saw in Section 1, this was a relatively simple piece of software, but completing it was a major struggle for a coder who had to re-teach himself C at the same time.

The key point here is that ALL SUCH AMATEUR RADIO SYSTEMS of this class likely have the same problems that WINLINK (pactor) had, before I wrote that software.

FLDGI/FLMSG TESTS

In order to test that hypothesis, I equipped three amateur radio stations with a popular (and completely legal, completely unencrypted) software system consisting of FLDGI and FLMSG. I used the latest versions of FLMSG and it took me a bit of time to become familiar with that software package so that I could reliably send compressed, ARQ-based file transfers from one station to the other.

In order to do that I had to specifically instruct the software to USE compression (default is not) and to use ARQ.. I had to set the radios to the same frequencies, and set the FLDGI's to use the same techniques (I used BPSK250.) One then needs to specify the callsign of the station to which the file is to be sent, and connection is established and a little green bar proceed through a horizontal bar graph moving from 1% to 100%, and then at the receiving side the user is notified that the file has been received properly, and offered a chance to click on it and read the file.

This is very very similar in many respects, obviously to how WINLINK EXPRESS accomplishes the exact same goal. Specify the target station, specify the mode, choose the frequency, hit "START" on WINLINK, watch the green bar move across the screen, get told the transfer is finished. Very much the same.

So then I attempted to monitor this transmission with the third station, set up identically to the first two. Although I'm not an expert at FLDGI/FLMSG, I've both used and taught these systems before to members of the local club, and I consider myself able to operate the software. No matter what I tried,

I could NOT get the 2nd station to capture the file other than the compressed transfer. I could NOT get the FLMSG software to decode it. I tried pasting it, opening it, everything I could guess. There may be a solution obviously, but I didn't find it. I even tried spoofing the callsign of the intended recipient, and did not succeed. Perhaps with more effort I might, but there were MANY back-and-forths with this system because of the much smaller packet size, and I doubt I could have kept up the same type clever experiment that I previously did with WINLINK.

Nevertheless, this FLDGI/FLMSG system is completely legal, completely open, completely unencrypted --- it just doesn't seem to have software written (AT THIS TIME) to fulfill the demands made upon WINLINK.

In Appendix 5, I present the compressed transfers that were easily captured by the monitor station -- proving I had the mode and frequency set properly -- you can even read the callsigns --- but unable to get it to decode the file that was sent (and perfectly received by the intended recipient) also shown there. And no wonder -- the monitor station, NOT being connected, was seeing transmissions from BOTH stations. Since I'm not familiar with that protocol I can't easily explain the back-and-forth. But again, this system is OPEN SOURCE and a little work would explain all of it. Another bit of software development and one could easily have a monitoring solution for it, similar to what I wrote for WINLINK. It just hasn't been done yet, to my knowledge.

And There Is The Rub

If vociferous amateur radio operators are going to besiege the WINLINK DEVELOPMENT TEAM and the FCC with cries of "obscured!" and "effectively encrypted" and "illegal!" -- then **shouldn't the same concerns have been raised about all the systems in the same class, as listed by me above?**

Yet to my knowledge, this has NEVER happened.

Simple google searches for

FLDGI FLMSG obscured
FLDGI FLMSG encrypted

brought up almost nothing. There was one comment where the apparent software author quipped that he was glad the writer had not used the dreaded "encrypted" word, in a discussion of the compression algorithm.⁸⁶

I have made modest inquiries as to whether there had ever been any controversy about FBB or D-RATS compressed file transfers, without anyone remembering any such flame wars as we have seen against WINLINK.

86 <https://groups.io/g/nbems/message/14871>

Obviously, it is not proper to hold one system alone to a higher standard. A Federal Agency would not be allowed to get away with that. Nor should amateur radio operators, petitioners or "experts.". I would therefore call on all involved to reject such **bias and prejudice, hold accountable those who have for so many years blatantly exhibited it,** and move toward any desired monitoring solutions for ALL such similar systems without favoritism. I made a failed attempt at getting people to recognize this faulty judgment system used by multiple commenters on a national amateur radio forum (QRZ):

FAULTY LOGIC:

Can the compressed file transfers be readily interpreted by any reader

If YES -- system is not encrypted

If NO -- system is encrypted or "effectively encrypted" and therefore Illegal.

That QRZ attempt did not go well. Despite my careful efforts to only ask Socratic questions and avoid any false statements about an excellent system in wide usage, several readers were incensed even at the thought that someone would ask questions about (favored) FLDGI. My statements appeared to be misinterpreted angrily. Some participants appeared to create unrelated discussions in the thread-^{87 88 89}⁹⁰ and even more angry-appearing statements.^{91 92} I carefully explained the issue and problem⁹³ in a lengthy post and the responses are enough to make one wonder about the future of amateur radio.⁹⁴

How many years have the WINLINK Development Team been victimized by such blatantly biased and prejudiced application of these (faulty) criteria, and their work welcomed with angry attacks? It is no wonder to me that this has not gone well over the last 19 years. **Such bias needs to be roundly condemned.** I call for public, sincere, and detailed apologies to SCS and the Winlink Development Team. Let's hope for better in the future.

87 W7UUU: <https://forums.qrz.com/index.php?threads/can-anyone-read-fldigi.673378/page-3#post-5196576>

88 W3WN: <https://forums.qrz.com/index.php?threads/can-anyone-read-fldigi.673378/page-4#post-5196637>

89 KK4ZYM: <https://forums.qrz.com/index.php?threads/can-anyone-read-fldigi.673378/page-4#post-5196647>

90 KK4ZYM: <https://forums.qrz.com/index.php?threads/can-anyone-read-fldigi.673378/page-6#post-5196768>

91 <https://forums.qrz.com/index.php?threads/can-anyone-read-fldigi.673378/page-4#post-5196635>

92 <https://forums.qrz.com/index.php?threads/can-anyone-read-fldigi.673378/page-13#post-5197213>

93 Gibby: <https://forums.qrz.com/index.php?threads/can-anyone-read-fldigi.673378/page-9#post-5196969>

94 I removed the footnotes identifying the individuals who still attacked me, for explaining how prejudiced had been the application of an even false standard. It would seem excessively humiliating to be identified as having so closely resembled the characteristics of a bigot.

APPENDIX 1 : Sept 8 0908/capturefileN5TW%232-time1555.txt

RECONSTRUCTED EMAIL: (successful capture on my first successful tip to the ParkNRide)

<https://qsl.net/n/nf4rc//Tech/RaspberryPiWinlinkDecoder/0908/reconstruct0908N5TW%232-time1555.txt>

MID: 00HVWTJJHS1W
Date: 2019/09/08 19:54
From: SMTP:ggibby@anest.ufl.edu
To: KX4Z
Subject: Test
Mbo: SMTP
Body: 463

This is a dictated email so I will have something to test myself. We have finally gotten a good signal on N5TW. Before that it looked like my home station has a higher noise level from the solar panel charge controller's and thus it never got any signal- when I was getting s1 week but readable signal sitting in the park-and-ride in Newberry Florida.

It looks like N 5TW on 20 m is the station that my home station can actually monitor.

Sent from my iPhone

```
=====

###PLISTEN: Level: 3:
###STATUS: SL: 5, CYC: 0, RQ: 0, REV: 0, LSB: 0, dF: -21.3, CRC: 0C7F, FRCNT: 3,
FRNR: 134
###PAYLOAD1: LEN: 0, TYPE: 0
###PAYLOAD2:

###PAYLOAD_END
Ã%Ã°
###PLISTEN: Level: 3:
###STATUS: SL: 3, CYC: 0, RQ: 0, REV: 1, LSB: 0, dF: -21.8, CRC: D522, FRCNT: 1,
FRNR: 135
###PAYLOAD1: LEN: 59, TYPE: 0
###PAYLOAD2:
: KX4Z 00HVWTJJHS1W 432 ggibby@anest.ufl.edu Test
FC EM 00H
###PAYLOAD_END
Ã%Ã°
###PLISTEN: Level: 3:
###STATUS: SL: 3, CYC: 0, RQ: 0, REV: 0, LSB: 0, dF: -21.9, CRC: 1D12, FRCNT: 2,
FRNR: 136
```

###PAYLOAD1: LEN: 26, TYPE: 0
###PAYLOAD2:
VWTJJHS1W 588 432 0
F> 4B

###PAYLOAD_END
Ã¼Ã°
###PLISTEN: Level: 3:
###STATUS: SL: 3, CYC: 0, RQ: 0, REV: 1, LSB: 0, dF: -21.6, CRC: 370D, FRCNT: 3,
FRNR: 137
###PAYLOAD1: LEN: 0, TYPE: 0
###PAYLOAD2:

###PAYLOAD_END
Ã¼Ã°
###PLISTEN: Level: 3:
###STATUS: SL: 3, CYC: 0, RQ: 0, REV: 0, LSB: 0, dF: -22.1, CRC: 4792, FRCNT: 0,
FRNR: 138
###PAYLOAD1: LEN: 0, TYPE: 0
###PAYLOAD2:

###PAYLOAD_END
Ã¼Ã°
###PLISTEN: Level: 3:
###STATUS: SL: 3, CYC: 0, RQ: 0, REV: 0, LSB: 0, dF: -23.0, CRC: 57DD, FRCNT: 1,
FRNR: 139
###PAYLOAD1: LEN: 55, TYPE: 8
###PAYLOAD2:
65, 73, 74, 00, 30, 00, 02, FA, 6F, E7, 4C, 02, 00, 00, EC, F5, 7A, 1C, 6D, 67, 6F, 79, D4, F1, 78, FC, 1D, 6B
, AB, EE, FE, F6, F3, 33, 96, C3, F6, 80, 7C, 70, B0, 77, D7, F7, 1C, 5D, DD, 28, C0, 17, 12, 9D, 1B, 1A, 3C

###PAYLOAD_END
Ã¼Ã°
###PLISTEN: Level: 3:
###STATUS: SL: 3, CYC: 0, RQ: 0, REV: 1, LSB: 0, dF: -21.6, CRC: 2727, FRCNT: 2,
FRNR: 140
###PAYLOAD1: LEN: 57, TYPE: 8
###PAYLOAD2:
1E, 05, BD, B7, 4B, FD, FB, FC, D3, AB, 73, 8B, 77, DC, 87, E7, 3D, F5, F7, 4E, 02, F3, 2D, 7F, 56, 7F, FB, 4D
, D0, 0F, CB, F1, 2E, F3, E1, 2C, F5, D4, 6A, 18, 9A, EB, F9, 29, 3C, D2, 23, BD, 6C, DB, ED, 27, DE, ED, F6, A
3, 56

###PAYLOAD_END
Ã¼Ã°
###PLISTEN: Level: 3:
###STATUS: SL: 4, CYC: 0, RQ: 0, REV: 0, LSB: 0, dF: -23.3, CRC: F18A, FRCNT: 3,
FRNR: 141
###PAYLOAD1: LEN: 112, TYPE: 8
###PAYLOAD2:
88, 17, 59, A4, 14, E1, 9B, B8, E1, 75, B9, CC, E2, E6, DF, 71, 8F, 0B, 7E, CB, 2E, C6, 1F, 49, D9, 87, 0F, 01
, 2E, 2A, 94, B0, 0F, 51, 2D, 97, 99, 0A, 06, 0B, A5, 0E, 91, B9, F1, 12, 06, 39, 94, AA, 59, 21, F4, 82, 60, E
3, 48, 90, 4C, B9, 92, E8, 20, 54, 1C, A9, 25, F5, 05, D6, A6, 24, A9, 6F, 93, ED, F4, 21, 14, 60, B2, 86, 24,
EF, D2, 0E, 7F, 3E, 96, E4, 90, F0, 41, 3E, FF, E8, C1, 3A, 0B, 7F, 7E, 3F, 3D, 52, F0, 36, 73, EE, 9E, 17, E6
, 8B

###PAYLOAD_END
Ã¼Ã°

```
####PLISTEN: Level: 3:
####STATUS: SL: 4, CYC: 0, RQ: 0, REV: 1, LSB: 0, dF: -23.1, CRC: F050, FRCNT: 0,
FRNR: 142
####PAYLOAD1: LEN: 118, TYPE: 8
####PAYLOAD2:
DF, F2, 94, 8E, 43, 4E, C0, AE, BA, 37, F2, 59, 65, A8, 50, 39, 24, 03, 3F, A5, 28, 76, FC, C6, E0, 23, 0D, E4
, 3A, 9A, DF, 38, F8, 2F, 02, B6, FC, 9F, EB, E7, 60, 03, FA, 00, D6, FB, 7F, 40, D4, 2D, 48, 1D, C3, 53, 6C, 4
3, 7C, B1, 65, 07, CC, EF, 61, 96, 21, 2D, 5E, DD, FA, E7, 3F, 9D, 77, 6E, 2D, EB, 0F, 7D, 67, B0, 9E, 16, 12,
0E, 66, 8C, 8E, BA, FB, 9B, 99, 0A, E0, 49, 9A, DF, DC, AC, 59, A3, AB, 49, 3E, CA, AA, 2D, CF, 34, D1, F0, 9E
, 4E, 35, AF, A3, 36, 2B, 3E
```

```
####PAYLOAD_END
Ã¼Ã°
####PLISTEN: Level: 3:
####STATUS: SL: 4, CYC: 0, RQ: 0, REV: 0, LSB: 0, dF: -23.7, CRC: CB6B, FRCNT: 1,
FRNR: 143
####PAYLOAD1: LEN: 102, TYPE: 8
####PAYLOAD2:
63, BD, 9C, 2D, C3, DE, CA, 93, 44, 1A, 1D, 62, 44, 7B, D4, 92, 2F, FA, 79, C7, C5, C4, E8, A4, DA, 53, BF, 0B
, DE, 0A, 07, E3, 8F, 66, 2B, BE, D4, F0, DB, E6, 82, 79, C1, BE, B8, AC, B6, D2, 68, 58, A4, B5, 71, 95, 0F, A
D, 47, 93, 05, 88, 2B, AF, 9D, AA, 11, D1, 4C, A1, 94, B7, E8, A1, DE, 69, 95, 9B, 25, 95, B0, 56, ED, 25, 4C,
96, AB, 14, 64, C7, 7D, E7, 6D, 35, 19, 95, 74, 9F, FC, AC, AE, E0, 04, 98
```

```
####PAYLOAD_END
Ã¼Ã°
####PLISTEN: Level: 3:
####STATUS: SL: 4, CYC: 0, RQ: 0, REV: 1, LSB: 0, dF: -24.2, CRC: 4F65, FRCNT: 2,
FRNR: 144
####PAYLOAD1: LEN: 0, TYPE: 0
####PAYLOAD2:
```

APPENDIX 2 : Sept 10 CAPTUREFILE 1529.TXT AND RESULTING RECONSTRUCTED EMAIL

RESULTING RECONSTRUCTED EMAIL:

(First capture, 2nd successful trip to the ParkNRide)

MID: KATRLV3KNRBU
Date: 2019/09/10 19:32
From: SMTP:docvacuumtubes@gmail.com
To: KX4Z
Subject: Test 4
Mbo: SMTP
Body: 224

This is a test to see if my idea of having the station check every few minutes for (E-mail) will give me some traffic to test by. The first hour was a complete bust, there just wasn't any traffic.

Sent from my iPhone

```
cmd: PMON VERBOSE 3
*** PMON VERBOSE: 3

cmd: PMON HEX 1
*** PMON HEX: 1

cmd: PMON A

cmd: PMON PACKETS 1
*** PMON PACKETS: 1

cmd: PMO
*** ERROR: No such command: PMO
```

Enter 'Help' for available commands.

cmd: PMON START

FACTOR-1/2/3 Monitor started:
=====

cmd: ú

###CONNECT: [Robust Call: N5TW]
þú

###CONNECT: [Robust Call: N5TW]
þú

###CONNECT: [Robust Call: N5TW]
þú

###CONNECT: [Robust Call: N5TW]
þú

###CONNECT: [Robust Call: N5TW]
þú

###CONNECT: [Robust Call: N5TW]
þú

###PLISTEN: Level: 3:
###STATUS: SL: 1, CYC: 0, RQ: 0, REV: 0, LSB: 0, dF: 3.9, CRC: 8D9B, FRCNT: 2,
FRNR: 1
###PAYLOAD1: LEN: 0, TYPE: 0
###PAYLOAD2:

###PAYLOAD_END
þú

###PLISTEN: Level: 3:
###STATUS: SL: 5, CYC: 0, RQ: 0, REV: 1, LSB: 0, dF: 4.4, CRC: ABBA, FRCNT: 1,
FRNR: 2
###PAYLOAD1: LEN: 154, TYPE: 0
###PAYLOAD2:

Trimode 1.3.25.3 Welcome to the N5TW RMS Trimode station...
KX4Z has 1434 minutes remaining with N5TW
[WL2K-5.0-B2FWIHJM\$]
;PQ: 91842522
CMS via N5TW >

###PAYLOAD_END
þú

###PLISTEN: Level: 3:
###STATUS: SL: 5, CYC: 0, RQ: 0, REV: 0, LSB: 0, dF: 4.2, CRC: 5FF2, FRCNT: 2,
FRNR: 3
###PAYLOAD1: LEN: 0, TYPE: 0
###PAYLOAD2:

```
###PAYLOAD_END
pú
###PLISTEN: Level: 3:
###STATUS: SL: 5, CYC: 0, RQ: 0, REV: 0, LSB: 0, dF: 4.7, CRC: 11C6, FRCNT: 1,
FRNR: 4
###PAYLOAD1: LEN: 122, TYPE: 0
###PAYLOAD2:
: KX4Z|86339365 KX4Z|91720933
;WL2K-Radio_Network
[RMS Relay-3.0.53.1-B2FWIHJM$]
;PR: 94907242
; N5TW DE KX4Z (EL89RQ)
FF
```

```
###PAYLOAD_END
pú
###PLISTEN: Level: 3:
###STATUS: SL: 4, CYC: 0, RQ: 0, REV: 0, LSB: 0, dF: 3.8, CRC: 5146, FRCNT: 0,
FRNR: 5
###PAYLOAD1: LEN: 122, TYPE: 0
###PAYLOAD2:
vacuumtubes@gmail.com Test 3
;PM: KX4Z KATRLV3KNRBU 292 docvacuumtubes@gmail.com Test 4
;PM: KX4Z 9APR28GZ29VN 2381 W4AKH@
###PAYLOAD_END
```

```
pú
###PLISTEN: Level: 3:
###STATUS: SL: 4, CYC: 0, RQ: 0, REV: 1, LSB: 0, dF: 3.7, CRC: 947D, FRCNT: 1,
FRNR: 6
###PAYLOAD1: LEN: 96, TYPE: 0
###PAYLOAD2:
winlink.org //WL2K FL WLNK Net - Check in Report - CORRECTED
FC EM KATRLV3KNRBU 355 292 0
F> 45
```

```
###PAYLOAD_END
pú
###PLISTEN: Level: 3:
###STATUS: SL: 4, CYC: 0, RQ: 0, REV: 0, LSB: 0, dF: 3.8, CRC: 4F65, FRCNT: 2,
FRNR: 7
###PAYLOAD1: LEN: 0, TYPE: 0
###PAYLOAD2:
```

```
###PAYLOAD_END
pú
###PLISTEN: Level: 3:
###STATUS: SL: 5, CYC: 0, RQ: 0, REV: 1, LSB: 0, dF: 4.4, CRC: 2376, FRCNT: 1,
FRNR: 8
###PAYLOAD1: LEN: 2, TYPE: 0
###PAYLOAD2:
Y
```

```
###PAYLOAD_END
```

```

bú
###PLISTEN: Level: 3:
###STATUS: SL: 5, CYC: 0, RQ: 1, REV: 0, LSB: 0, dF: 4.4, CRC: 2376, FRCNT: 1,
FRNR: 9
###PAYLOAD1: LEN: 2, TYPE: 0
###PAYLOAD2:
Y

###PAYLOAD_END
bú
###PLISTEN: Level: 3:
###STATUS: SL: 5, CYC: 0, RQ: 0, REV: 1, LSB: 0, dF: 4.4, CRC: 5FF2, FRCNT: 2,
FRNR: 10
###PAYLOAD1: LEN: 0, TYPE: 0
###PAYLOAD2:

###PAYLOAD_END
bú
###PLISTEN: Level: 3:
###STATUS: SL: 3, CYC: 0, RQ: 0, REV: 0, LSB: 0, dF: 4.4, CRC: 93AB, FRCNT: 1,
FRNR: 11
###PAYLOAD1: LEN: 57, TYPE: 8
###PAYLOAD2:
65,73,74,20,34,00,30,00,02,FA,96,90,63,01,00,00,EC,F5,7A,1C,6D,67,5F,9B,E0,EF,7
6,3C,5B,FC,0E,D5,EF,3B,C3,99,CB,61,FB,40,3E,38,58,3B,ED,E6,F7,8B,BB,B0,AE,A3,AF
,A1,52,6C,F9

###PAYLOAD_END
bú
###PLISTEN: Level: 3:
###STATUS: SL: 3, CYC: 0, RQ: 0, REV: 1, LSB: 0, dF: 4.0, CRC: DBEE, FRCNT: 2,
FRNR: 12
###PAYLOAD1: LEN: 56, TYPE: 8
###PAYLOAD2:
B7,56,36,D6,BD,2F,F7,EF,F3,4A,AF,7F,16,FB,B9,07,C2,83,DE,05,69,36,02,EF,3F,66,F
3,DD,65,FF,E6,7C,DD,BF,FA,FE,37,4F,A0,C9,70,ED,F4,4C,51,1D,E4,E0,79,A1,C2,9E,99
,2D,F6,73

###PAYLOAD_END
bú
###PLISTEN: Level: 3:
###STATUS: SL: 3, CYC: 0, RQ: 0, REV: 0, LSB: 0, dF: 4.5, CRC: 5CB3, FRCNT: 3,
FRNR: 13
###PAYLOAD1: LEN: 54, TYPE: 8
###PAYLOAD2:
15,D3,AB,C1,7D,2A,F5,87,F5,95,6C,CA,04,37,8B,1F,2C,AD,C2,53,80,AA,0A,25,8E,42,A
5,0C,BE,91,CB,18,44,05,21,A3,9D,05,27,A6,36,C7,1C,34,1F,23,10,DE,64,A7,93,25,0A
,16

###PAYLOAD_END
bú
###PLISTEN: Level: 3:
###STATUS: SL: 3, CYC: 0, RQ: 0, REV: 1, LSB: 0, dF: 4.4, CRC: 7AFC, FRCNT: 0,
FRNR: 14

```



```
###PAYLOAD1: LEN: 54, TYPE: 8
###PAYLOAD2:
A1,B8,99,A0,FF,51,EA,44,7B,0B,15,43,FE,19,54,EF,7D,4D,F0,6A,7F,7C,38,14,24,7C,4
0,3D,3F,0C,68,8F,67,10,1F,43,D0,0F,ED,38,3B,9F,53,4B,6B,F4,03,E3,7C,BF,FB,C2,31
,01

###PAYLOAD_END
þú
###PLISTEN: Level: 3:
###STATUS: SL: 3, CYC: 0, RQ: 0, REV: 0, LSB: 0, dF: 4.7, CRC: 9B71, FRCNT: 1,
FRNR: 15
###PAYLOAD1: LEN: 58, TYPE: 8
###PAYLOAD2:
27,0E,7A,D8,09,D1,A4,BC,78,E0,73,05,31,E4,AE,76,8A,30,38,6E,4B,7E,E7,66,E0,DD,5
B,7B,E3,FF,3C,F5,99,9C,A1,D0,42,C2,D8,02,2A,5F,D3,F7,96,C9,0D,65,D7,C1,83,AF,80
,BE,A1,F3,6D,AE

###PAYLOAD_END
þú
###PLISTEN: Level: 3:
###STATUS: SL: 3, CYC: 0, RQ: 0, REV: 1, LSB: 0, dF: 4.4, CRC: 8986, FRCNT: 2,
FRNR: 16
###PAYLOAD1: LEN: 27, TYPE: 8
###PAYLOAD2:
FF,9D,FB,E8,F2,37,6B,FF,90,8C,00,3D,17,D1,D8,11,E2,A9,FB,9F,B3,BC,37,E7,70,04,1
4

###PAYLOAD_END
þú
###PLISTEN: Level: 3:
###STATUS: SL: 3, CYC: 0, RQ: 0, REV: 0, LSB: 0, dF: 4.4, CRC: 370D, FRCNT: 3,
FRNR: 17
###PAYLOAD1: LEN: 0, TYPE: 0
###PAYLOAD2:

###PAYLOAD_END
þú
###PLISTEN: Level: 3:
###STATUS: SL: 5, CYC: 0, RQ: 0, REV: 1, LSB: 0, dF: 5.3, CRC: 6D69, FRCNT: 1,
FRNR: 18
###PAYLOAD1: LEN: 0, TYPE: 0
###PAYLOAD2:

###PAYLOAD_END
þú
###PLISTEN: Level: 3:
###STATUS: SL: 5, CYC: 0, RQ: 1, REV: 0, LSB: 0, dF: 4.7, CRC: 6D69, FRCNT: 1,
FRNR: 19
###PAYLOAD1: LEN: 0, TYPE: 0
###PAYLOAD2:

###PAYLOAD_END
þú
###PLISTEN: Level: 3:
```

```
###STATUS: SL: 5, CYC: 0, RQ: 0, REV: 1, LSB: 0, dF: 4.7, CRC: 5FF2, FRCNT: 2,
FRNR: 20
###PAYLOAD1: LEN: 0, TYPE: 0
###PAYLOAD2:

###PAYLOAD_END
pú
###PLISTEN: Level: 3:
###STATUS: SL: 3, CYC: 0, RQ: 0, REV: 0, LSB: 0, dF: 4.7, CRC: 141F, FRCNT: 1,
FRNR: 21
###PAYLOAD1: LEN: 0, TYPE: 0
###PAYLOAD2:

###PAYLOAD_END
pú
###PLISTEN: Level: 3:
###STATUS: SL: 3, CYC: 0, RQ: 0, REV: 1, LSB: 0, dF: 5.1, CRC: 6480, FRCNT: 2,
FRNR: 22
###PAYLOAD1: LEN: 0, TYPE: 0
###PAYLOAD2:

###PAYLOAD_END
pú
###PLISTEN: Level: 3:
###STATUS: SL: 3, CYC: 0, RQ: 0, REV: 1, LSB: 0, dF: 4.9, CRC: 9017, FRCNT: 1,
FRNR: 23
###PAYLOAD1: LEN: 0, TYPE: 0
###PAYLOAD2:

###PAYLOAD_END
pú

###CONNECT: [Robust Call: N5TW]
pú

###CONNECT: [Robust Call: N5TW]
pú

###CONNECT: [Robust Call: N5TW]
pú

###CONNECT: [Robust Call: N5TW]
pú

###CONNECT: [Robust Call: N5TW]
pú

###CONNECT: [Robust Call: N5TW]
pú

###CONNECT: [Robust Call: N5TW]
pú
```

APPENDIX 3: Sept 10 CAPTUREFILE1538 AND RESULTING EMAIL

(2nd successful capture on my 2nd successful trip to the ParkNRide; 20 meters)

RESULTING EMAIL:

MID: 01WXNGMTWL8W
Date: 2019/09/10 19:39
From: SMTP:docvacuumtubes@gmail.com
To: KX4Z
Subject: Test 5
Mbo: SMTP
Body: 1255

Sent from my iPhone

Begin forwarded message:

> From: "Tom Whiteside" <tomw@ecpi.com>
> Date: September 10, 2019 at 15:30:11 EDT
> To: "'Gordon Gibby'" <docvacuumtubes@gmail.com>
> Subject: RE: Testing.
>
> Okay - it has been up and down a bit installing some new Trimode test
versions for Phil and doing a Windows update but it should be up the rest of
the afternoon. Good hunting!
>
> Tom
>
> -----Original Message-----
> From: Gordon Gibby <docvacuumtubes@gmail.com>
> Sent: Tuesday, September 10, 2019 2:01 PM
> To: tomw@ecpi.com; lee@iqed.net; lor@w3qa.net; Steve Waterman
<k4cjsx@comcast.net>
> Subject: Testing.
>
> Tom, I got nowhere in my first hour of hot & sweaty testing today, although
your signal remained incredibly strong on 20 m. For some reason my radio only
didn't do what I thought it would. I discovered I had so much ignition noise I
had to shut the truck down to make things work.
>
>
>
> For about the next two hours, I am trying to get my station to log into yours
every few minutes, to pull email. After that I will disable the excessive
polling
>
> If you need to reach me for any reason, I'm on my cell phone, 352 Dash XXX-
XXXX
>

> Gordon
>
>
> Sent from my iPhone=
>

=====

NOTE: RQ:1 PACKETS WERE EDITED OUT.

cmd: PMON START

PACTOR-1/2/3 Monitor started:
=====

cmd: ú

þú
###PLISTEN: Level: 3:
###STATUS: SL: 1, CYC: 0, RQ: 0, REV: 0, LSB: 0, dF: 18.2, CRC: 8D9B, FRCNT: 2,
FRNR: 24
###PAYLOAD1: LEN: 0, TYPE: 0
###PAYLOAD2:

###PAYLOAD_END

þú
###PLISTEN: Level: 3:
###STATUS: SL: 3, CYC: 0, RQ: 0, REV: 1, LSB: 0, dF: 16.4, CRC: 207A, FRCNT: 1,
FRNR: 25
###PAYLOAD1: LEN: 59, TYPE: 0
###PAYLOAD2:

Trimode 1.3.25.3 Welcome to the N5TW RMS Trimode station..

###PAYLOAD_END

þú
###PLISTEN: Level: 3:
###STATUS: SL: 3, CYC: 0, RQ: 0, REV: 0, LSB: 0, dF: 15.2, CRC: 2099, FRCNT: 2,
FRNR: 26
###PAYLOAD1: LEN: 59, TYPE: 0
###PAYLOAD2:

.
KX4Z has 1433 minutes remaining with N5TW

[WL2K-5.0-B2FW

###PAYLOAD_END

þú
###PLISTEN: Level: 3:
###STATUS: SL: 3, CYC: 0, RQ: 0, REV: 1, LSB: 0, dF: 15.2, CRC: 9A82, FRCNT: 3,
FRNR: 27
###PAYLOAD1: LEN: 36, TYPE: 0

```
###PAYLOAD2:
IHJM$]
;PQ: 71430597
CMS via N5TW >
```

```
###PAYLOAD_END
```

```
þú
###PLISTEN: Level: 3:
###STATUS: SL: 3, CYC: 0, RQ: 0, REV: 0, LSB: 0, dF: 14.6, CRC: 0596, FRCNT: 0,
FRNR: 28
###PAYLOAD1: LEN: 0, TYPE: 0
###PAYLOAD2:
```

```
###PAYLOAD_END
```

```
þú
###PLISTEN: Level: 3:
###STATUS: SL: 3, CYC: 0, RQ: 1, REV: 1, LSB: 0, dF: 15.0, CRC: 0596, FRCNT: 0,
FRNR: 29
###PAYLOAD1: LEN: 0, TYPE: 0
###PAYLOAD2:
```

```
###PAYLOAD_END
```

```
þú
###PLISTEN: Level: 3:
###STATUS: SL: 3, CYC: 0, RQ: 1, REV: 0, LSB: 0, dF: 15.1, CRC: 0596, FRCNT: 0,
FRNR: 30
###PAYLOAD1: LEN: 0, TYPE: 0
###PAYLOAD2:
```

```
###PAYLOAD_END
```

```
þú
###PLISTEN: Level: 3:
###STATUS: SL: 3, CYC: 0, RQ: 1, REV: 1, LSB: 0, dF: 14.9, CRC: 0596, FRCNT: 0,
FRNR: 31
###PAYLOAD1: LEN: 0, TYPE: 0
###PAYLOAD2:
```

```
###PAYLOAD_END
```

```
þú
###PLISTEN: Level: 3:
###STATUS: SL: 3, CYC: 0, RQ: 1, REV: 0, LSB: 0, dF: 15.3, CRC: 0596, FRCNT: 0,
FRNR: 32
###PAYLOAD1: LEN: 0, TYPE: 0
###PAYLOAD2:
```

```
###PAYLOAD_END
```

```
þú
###PLISTEN: Level: 3:
###STATUS: SL: 3, CYC: 0, RQ: 1, REV: 1, LSB: 0, dF: 15.4, CRC: 0596, FRCNT: 0,
FRNR: 33
###PAYLOAD1: LEN: 0, TYPE: 0
###PAYLOAD2:
```

```
###PAYLOAD_END
```

```

pú
###PLISTEN: Level: 3:
###STATUS: SL: 3, CYC: 0, RQ: 0, REV: 0, LSB: 0, dF: 15.5, CRC: 8945, FRCNT: 1,
FRNR: 34
###PAYLOAD1: LEN: 59, TYPE: 0
###PAYLOAD2:
: KX4Z ODOWBEOID7G8 197 docvacuumtubes@gmail.com Test 3
;PM
###PAYLOAD_END
pú
###PLISTEN: Level: 3:
###STATUS: SL: 3, CYC: 0, RQ: 0, REV: 1, LSB: 0, dF: 14.7, CRC: 9B3A, FRCNT: 2,
FRNR: 35
###PAYLOAD1: LEN: 59, TYPE: 0
###PAYLOAD2:
: KX4Z KATRLV3KNRBU 292 docvacuumtubes@gmail.com Test 4
;PM
###PAYLOAD_END
pú
###PLISTEN: Level: 3:
###STATUS: SL: 4, CYC: 0, RQ: 0, REV: 0, LSB: 0, dF: 14.5, CRC: 3FA0, FRCNT: 3,
FRNR: 36
###PAYLOAD1: LEN: 122, TYPE: 0
###PAYLOAD2:
: KX4Z 01WXNGMTWL8W 847 docvacuumtubes@gmail.com Test 5
;PM: KX4Z 9APR28GZ29VN 2381 W4AKH@winlink.org //WL2K FL WLNK Net -
###PAYLOAD_END
pú
###PLISTEN: Level: 3:
###STATUS: SL: 4, CYC: 0, RQ: 0, REV: 1, LSB: 0, dF: 14.3, CRC: 2318, FRCNT: 0,
FRNR: 37
###PAYLOAD1: LEN: 122, TYPE: 0
###PAYLOAD2:
Check in Report - CORRECTED
;PM: KX4Z ODOWBEOID7G8 197 docvacuumtubes@gmail.com Test 3
;PM: KX4Z KATRLV3KNRBU 292 docvacu
###PAYLOAD_END
pú
###PLISTEN: Level: 3:
###STATUS: SL: 4, CYC: 0, RQ: 0, REV: 0, LSB: 0, dF: 14.3, CRC: 05FC, FRCNT: 1,
FRNR: 38
###PAYLOAD1: LEN: 122, TYPE: 0
###PAYLOAD2:
umtubes@gmail.com Test 4
;PM: KX4Z 01WXNGMTWL8W 847 docvacuumtubes@gmail.com Test 5
;PM: KX4Z 9APR28GZ29VN 2381 W4AKH@winl
###PAYLOAD_END
pú
###PLISTEN: Level: 3:
###STATUS: SL: 4, CYC: 0, RQ: 0, REV: 1, LSB: 0, dF: 14.4, CRC: 6A3F, FRCNT: 2,
FRNR: 39
###PAYLOAD1: LEN: 93, TYPE: 0
###PAYLOAD2:
ink.org //WL2K FL WLNK Net - Check in Report - CORRECTED

```

FC EM 01WXNGMTWL8W 1387 847 0

F> 1A

###PAYLOAD_END

þú

###PLISTEN: Level: 3:

###STATUS: SL: 4, CYC: 0, RQ: 0, REV: 0, LSB: 0, dF: 14.5, CRC: 5EEC, FRCNT: 3, FRNR: 40

###PAYLOAD1: LEN: 0, TYPE: 0

###PAYLOAD2:

###PAYLOAD_END

þú

###PLISTEN: Level: 3:

###STATUS: SL: 4, CYC: 0, RQ: 1, REV: 1, LSB: 0, dF: 13.8, CRC: 5EEC, FRCNT: 3, FRNR: 41

###PAYLOAD1: LEN: 0, TYPE: 0

###PAYLOAD2:

###PAYLOAD_END

þú

###PLISTEN: Level: 3:

###STATUS: SL: 1, CYC: 0, RQ: 0, REV: 0, LSB: 0, dF: 14.9, CRC: 088C, FRCNT: 1, FRNR: 42

###PAYLOAD1: LEN: 2, TYPE: 0

###PAYLOAD2:

Y

###PAYLOAD_END

þú

###PLISTEN: Level: 3:

###STATUS: SL: 1, CYC: 0, RQ: 0, REV: 1, LSB: 0, dF: 15.1, CRC: 8D9B, FRCNT: 2, FRNR: 43

###PAYLOAD1: LEN: 0, TYPE: 0

###PAYLOAD2:

###PAYLOAD_END

þú

###PLISTEN: Level: 3:

###STATUS: SL: 1, CYC: 0, RQ: 0, REV: 0, LSB: 0, dF: 15.4, CRC: DE16, FRCNT: 3, FRNR: 44

###PAYLOAD1: LEN: 0, TYPE: 0

###PAYLOAD2:

###PAYLOAD_END

þú

###PLISTEN: Level: 3:

###STATUS: SL: 3, CYC: 0, RQ: 0, REV: 1, LSB: 0, dF: 15.0, CRC: D437, FRCNT: 1, FRNR: 45

###PAYLOAD1: LEN: 58, TYPE: 8

###PAYLOAD2:

65,73,74,20,35,00,30,00,02,FA,5E,91,6B,05,00,00,EC,F5,7A,1C,6D,66,F3,7B,E3,F2,76,BA,78,BE,0B,EE,C7,12,DE,67,2D,87,ED,00,F8,E1,60,EF,B0,2F,F8,BB,BA,75,F5,D4,AB,54,AB,42,96,FE


```
###PAYLOAD_END
pú
###PLISTEN: Level: 3:
###STATUS: SL: 3, CYC: 0, RQ: 0, REV: 1, LSB: 0, dF: 14.1, CRC: 9143, FRCNT: 2,
FRNR: 47
###PAYLOAD1: LEN: 58, TYPE: 8
###PAYLOAD2:
9D,AD,A7,4B,FD,FB,FC,D2,A9,DF,9D,75,DC,87,E1,41,EF,02,B3,99,01,73,9F,B2,81,EE,B
1,FF,F3,3E,6F,E1,FD,7F,1B,A8,8E,A4,3F,76,F2,1B,EE,75,EF,78,1E,68,50,67,A5,CA,7D
,9B,C4,6A,EB,90
```

```
###PAYLOAD_END
pú
###PLISTEN: Level: 3:
###STATUS: SL: 4, CYC: 0, RQ: 0, REV: 0, LSB: 0, dF: 14.3, CRC: 8C8A, FRCNT: 3,
FRNR: 48
###PAYLOAD1: LEN: 117, TYPE: 8
###PAYLOAD2:
1E,C9,BC,73,82,A2,73,99,E0,03,78,11,F3,0B,F3,93,9A,05,75,C4,EC,1B,5B,02,D4,10,0
A,83,BF,46,8F,E4,84,A1,19,4D,26,8C,9B,FA,2A,CA,8B,58,59,A9,48,D2,C4,CC,C8,AD,0B
,AE,38,E2,6C,28,41,DF,1C,3A,01,0F,FD,24,1B,E5,21,A0,D1,D7,79,5E,35,B6,AA,B8,B0,
FC,EB,F4,29,08,E4,18,B1,8A,92,45,ED,50,01,29,A4,93,C8,50,29,12,66,53,63,CA,73,7
3,29,40,1D,58,07,64,83,01,6D,91,FC
```

```
###PAYLOAD_END
pú
###PLISTEN: Level: 3:
###STATUS: SL: 4, CYC: 0, RQ: 0, REV: 1, LSB: 0, dF: 14.2, CRC: B620, FRCNT: 0,
FRNR: 49
###PAYLOAD1: LEN: 115, TYPE: 8
###PAYLOAD2:
3B,A3,F3,D9,58,69,4A,18,2F,44,A0,28,0F,E1,EC,CF,1D,DF,F1,57,AC,90,75,F1,F0,1A,C
8,02,FA,49,C4,D3,12,62,7A,24,95,33,86,CB,25,C2,E1,4D,14,41,6F,48,71,E6,47,04,4E
,8B,3A,AF,1D,6B,87,EB,7F,A9,4D,5D,C3,E3,D9,FC,F9,EF,EC,FA,7F,FA,9F,03,C4,35,64,
BD,B2,C6,2E,77,98,DF,DF,73,96,7E,AA,7F,3E,E9,CB,0A,38,96,CF,DD,17,C9,FC,96,E5,1
E,1C,5B,24,8A,2D,F5,C0,ED,F0
```

```
###PAYLOAD_END
pú
###PLISTEN: Level: 3:
###STATUS: SL: 4, CYC: 1, RQ: 0, REV: 0, LSB: 0, dF: 14.2, CRC: B714, FRCNT: 1,
FRNR: 50
###PAYLOAD1: LEN: 517, TYPE: 8
###PAYLOAD2:
9F,20,69,18,E2,F3,37,BE,12,32,A8,49,89,68,67,8F,06,2A,49,1D,5E,C8,DC,EC,8B,3E,4
5,95,C5,86,B5,68,FC,F0,22,7A,AA,BC,05,DF,B5,BD,1B,C1,8C,C2,8D,E0,63,19,3C,65,E5
,AE,67,B8,94,88,7B,E0,B5,5F,A8,10,46,60,00,A6,F3,C9,85,E3,42,17,B9,60,7B,A1,4F,
79,82,F8,2A,C3,DA,55,CA,C9,AD,5B,66,6A,A1,6A,DB,6E,2B,C9,FC,F6,2F,37,3D,F6,5F,7
E,5C,CB,0F,FF,9A,8E,7E,F7,AB,59,9D,3F,1A,D7,B9,B5,B8,40,35,AF,5D,AE,9B,BA,63,28
,1A,BC,96,A2,B3,CB,4B,70,89,91,95,F1,E1,3C,28,9C,00,92,64,17,53,8D,49,86,30,FA,
19,88,65,96,A1,E5,02,FA,C6,BF,4A,13,2C,D0,55,BB,CB,69,41,4C,6C,70,4D,28,A5,52,B
C,52,D1,A0,6B,04,85,87,F9,68,A6,60,0C,EE,5C,B2,03,33,94,31,EA,1C,4B,C9,72,F8,54
,53,C8,38,B2,91,46,3A,B4,A8,20,A0,87,08,82,21,D7,F4,26,10,BF,E7,BF,A9,F9,B1,67,
```

D2,56,B8,58,1D,69,30,7D,74,9A,DD,06,FC,0F,9B,D9,3F,DE,48,50,4D,31,1B,C1,17,05,D
C,17,82,62,CA,EB,73,7A,25,76,1B,A4,F5,A9,20,A6,E4,DA,B7,A1,B4,FD,A4,BF,7C,4B,CE
,F6,83,AD,02,AB,74,5F,8F,22,F3,DD,9F,DD,4B,71,31,CC,B2,78,44,8B,97,CE,64,C3,8B,
71,BA,53,75,AA,73,AC,FC,10,0D,1B,C1,44,0B,34,23,74,09,2C,8A,6F,E4,27,7F,E8,53,7
A,FD,C7,6D,B9,64,1D,C2,F7,02,01,F7,FC,AD,A9,0F,E2,1E,55,1F,C8,58,85,89,49,3D,D1
,94,CB,CE,E3,12,87,AC,66,F2,62,28,47,8C,35,B4,77,73,05,2A,9F,E6,76,6D,F3,AE,67,
8F,11,17,E1,DE,73,2B,16,63,4A,15,E3,D3,2D,5D,93,86,02,EA,C1,FD,02,61,BC,37,C8,8
3,ED,40,F8,36,07,71,31,28,47,DC,EC,EA,F7,7A,26,51,09,B1,C0,EC,40,89,4E,0C,75,89
,F7,BB,0E,C9,57,CA,44,C2,5B,17,06,29,2C,96,8C,4A,71,3E,D5,CE,5A,F1,D6,F4,CB,BB,
0C,43,5B,80,DD,D2,E7,C7,15,11,92,AF,33,59,1B,48,60,2D,79,BD,EE,14,B8,7D,E5,46,B
F,2A,4B,5A,8E,B0,75,28,E0,56,44,D3,75,5C,00,04,26

###PAYLOAD_END

þú

###PLISTEN: Level: 3:

###STATUS: SL: 4, CYC: 1, RQ: 0, REV: 1, LSB: 0, dF: 14.5, CRC: 5BF1, FRCNT: 2,
FRNR: 51

###PAYLOAD1: LEN: 0, TYPE: 0

###PAYLOAD2:

###PAYLOAD_END

þú

###PLISTEN: Level: 3:

###STATUS: SL: 1, CYC: 0, RQ: 0, REV: 1, LSB: 0, dF: 15.2, CRC: BF00, FRCNT: 1,
FRNR: 52

###PAYLOAD1: LEN: 0, TYPE: 0

###PAYLOAD2:

###PAYLOAD_END

þú

###PLISTEN: Level: 3:

###STATUS: SL: 1, CYC: 0, RQ: 0, REV: 0, LSB: 0, dF: 15.4, CRC: CF9F, FRCNT: 2,
FRNR: 53

###PAYLOAD1: LEN: 0, TYPE: 0

###PAYLOAD2:

###PAYLOAD_END

þú

###PLISTEN: Level: 3:

###STATUS: SL: 3, CYC: 0, RQ: 0, REV: 0, LSB: 0, dF: 15.9, CRC: 141F, FRCNT: 1,
FRNR: 54

###PAYLOAD1: LEN: 0, TYPE: 0

###PAYLOAD2:

###PAYLOAD_END

þú

###PLISTEN: Level: 3:

###STATUS: SL: 3, CYC: 0, RQ: 1, REV: 1, LSB: 0, dF: 15.5, CRC: 141F, FRCNT: 1,
FRNR: 55

###PAYLOAD1: LEN: 0, TYPE: 0

###PAYLOAD2:

###PAYLOAD_END

þú

```
###PLISTEN: Level: 3:
###STATUS: SL: 3, CYC: 0, RQ: 0, REV: 0, LSB: 0, dF: 14.7, CRC: 2684, FRCNT: 2,
FRNR: 56
###PAYLOAD1: LEN: 0, TYPE: 0
###PAYLOAD2:

###PAYLOAD_END
bú
###PLISTEN: Level: 3:
###STATUS: SL: 3, CYC: 0, RQ: 0, REV: 0, LSB: 0, dF: 15.3, CRC: 9017, FRCNT: 1,
FRNR: 57
###PAYLOAD1: LEN: 0, TYPE: 0
###PAYLOAD2:

###PAYLOAD_END
bú
###PLISTEN: Level: 3:
###STATUS: SL: 3, CYC: 0, RQ: 0, REV: 0, LSB: 0, dF: 15.2, CRC: 141F, FRCNT: 1,
FRNR: 58
###PAYLOAD1: LEN: 0, TYPE: 0
###PAYLOAD2:

###PAYLOAD_END
bú
###PLISTEN: Level: 3:
###STATUS: SL: 3, CYC: 0, RQ: 0, REV: 1, LSB: 0, dF: 14.2, CRC: 2684, FRCNT: 2,
FRNR: 59
###PAYLOAD1: LEN: 0, TYPE: 0
###PAYLOAD2:

###PAYLOAD_END
bú
###PLISTEN: Level: 3:
###STATUS: SL: 3, CYC: 0, RQ: 0, REV: 0, LSB: 0, dF: 14.9, CRC: 370D, FRCNT: 3,
FRNR: 60
###PAYLOAD1: LEN: 0, TYPE: 0
###PAYLOAD2:

###PAYLOAD_END
bú
###PLISTEN: Level: 3:
###STATUS: SL: 3, CYC: 0, RQ: 0, REV: 1, LSB: 0, dF: 14.2, CRC: 2684, FRCNT: 2,
FRNR: 61
###PAYLOAD1: LEN: 0, TYPE: 0
###PAYLOAD2:

###PAYLOAD_END
b
```

APPENDIX 4: Sept 10 CAPTUREFILE1620 AND RESULTING EMAIL: Washington's Farewell Address [truncated after loss of packet]

3rd capture on my 2nd successful trip to ParkNRide; incomplete capture; see discussion of diversity receiver; 20 meters-- very severe QSB to unreadable signal.

MID: Y275JQ0NZ01E
Date: 2019/09/10 20:13
From: SMTP:docvacuumtubes@gmail.com
To: KX4Z
Subject: Test six, George Washington
Mbo: SMTP
Body: 37136

Friends and Fellow Citizens:

The period for a new election of a citizen to administer the executive government of the United States being not far distant, and the time actually arrived when your thoughts must be employed in designating the person who is to be clothed with that important trust, it appears to me proper, especially as it may conduce to a more distinct expression of the public voice, that I should now apprise you of the resolution I have formed, to decline being considered among the number of those out of whom a choice is to be made.

I beg you, at the same time, to do me the justice to be assured that this resolution has not been taken without a strict regard to all the considerations appertaining to the relation which binds a dutiful citizen to his country; and that in withdrawing the tender of service, which silence in my situation might imply, I am influenced by no diminution of zeal for your future interest, no deficiency of grateful respect for your past kindness, but am supported by a full conviction that the step is compatible with both.

The acceptance of, and continuance hitherto in, the office to which your suffrages have twice called me have been a uniform sacrifice of inclination to the opinion of duty and to a deference for what appeared to be your desire. I constantly hoped that it would have been much earlier in my power, consistently with motives which I was not at liberty to disregard, to return to that retirement from which I had been reluctantly drawn. The strength of my inclination to do this, previous to the last election, had even led to the preparation of an address to declare it to you; but mature reflection on the then perplexed and critical posture of our affairs with foreign nations, and the unanimous advice of persons entitled to my confidence, impelled me to abandon the idea.

I rejoice that the state of your concerns, external as well as internal, no longer renders the pursuit of inclination incompatible with the sentiment of duty or propriety, and am persuaded, whatever partiality may be retained for my services, that, in the present circumstances of our country, you will not disapprove my determination to retire.

The impressions with which I first undertook the arduous trustrentureum_cu
external as well as po bestanxcoadthery, yo rus ', t muices, that, iny, rpast
kindness, but am supported by a ful} rro abra me my

a s the pursuit of inclination incompatible with tho nessng to4all the
considerations ae le wieu Biap guerien 5sJh partia t?ardXs continuance
hitherto u
sreju me h tho3f d a p

a s the pursuit of inclination incompatible with tho nes rT [aue th
t?arc muic
w n evio, ursuations ae le wieu ed5a tpnwa fXi0 re r to ro
continuDgo u
7.ous ont IncliniIilsmY determination to retire.

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s p
rietitedinpnti tanti tane bee le wieu ed5a tppnti tanti tan ta:er tan taThe
impressions wilble oab indtions ae le wieu ed5a earb
g ru sionhistanfThel whons w etermi cor myr rro abra me my

=====
NOTE: CAPTURED WITH PMON PACKETS 1 -- RQ:1 packets left in for your examination, and marked with bolding.

###CONNECT: [Robust Call: N5TW]
pú

###CONNECT: [Robust Call: N5TW]
pú

###CONNECT: [Robust Call: N5TW]
pú

###CONNECT: [Robust Call: N5TW]
pú

###CONNECT: [Robust Call: N5TW]
pú

###CONNECT: [Robust Call: N5TW]
pú

###CONNECT: [Robust Call: N5TW]
pú

###PLISTEN: Level: 3:
###STATUS: SL: 1, CYC: 0, RQ: 0, REV: 0, LSB: 0, dF: 16.0, CRC: 8D9B, FRCNT: 2,
FRNR: 62
###PAYLOAD1: LEN: 0, TYPE: 0
###PAYLOAD2:

```

###PAYLOAD_END
pú
###PLISTEN: Level: 3:
###STATUS: SL: 3, CYC: 0, RQ: 0, REV: 1, LSB: 0, dF: 16.4, CRC: 207A, FRCNT: 1,
FRNR: 63
###PAYLOAD1: LEN: 59, TYPE: 0
###PAYLOAD2:
  Trimode 1.3.25.3 Welcome to the N5TW RMS Trimode station..
###PAYLOAD_END
pú
###PLISTEN: Level: 3:
###STATUS: SL: 3, CYC: 0, RQ: 0, REV: 0, LSB: 0, dF: 16.1, CRC: 4CEF, FRCNT: 2,
FRNR: 64
###PAYLOAD1: LEN: 59, TYPE: 0
###PAYLOAD2:
.
KX4Z has 1431 minutes remaining with N5TW
[WL2K-5.0-B2FW
###PAYLOAD_END
pú
###PLISTEN: Level: 3:
###STATUS: SL: 3, CYC: 0, RQ: 0, REV: 1, LSB: 0, dF: 16.3, CRC: 6E6C, FRCNT: 3,
FRNR: 65
###PAYLOAD1: LEN: 36, TYPE: 0
###PAYLOAD2:
IHJM$]
;PQ: 29256739
CMS via N5TW >

###PAYLOAD_END
pú
###PLISTEN: Level: 3:
###STATUS: SL: 3, CYC: 0, RQ: 0, REV: 0, LSB: 0, dF: 16.3, CRC: 0596, FRCNT: 0,
FRNR: 66
###PAYLOAD1: LEN: 0, TYPE: 0
###PAYLOAD2:

###PAYLOAD_END
pú
###PLISTEN: Level: 3:
###STATUS: SL: 3, CYC: 0, RQ: 0, REV: 1, LSB: 0, dF: 16.7, CRC: 8945, FRCNT: 1,
FRNR: 67
###PAYLOAD1: LEN: 59, TYPE: 0
###PAYLOAD2:
: KX4Z ODOWBEOID7G8 197 docvacuumtubes@gmail.com Test 3
;PM
###PAYLOAD_END
pú
###PLISTEN: Level: 3:
###STATUS: SL: 3, CYC: 0, RQ: 0, REV: 0, LSB: 0, dF: 16.5, CRC: 9B3A, FRCNT: 2,
FRNR: 68
###PAYLOAD1: LEN: 59, TYPE: 0
###PAYLOAD2:

```

```

: KX4Z KATRLV3KNRBU 292 docvacuumtubes@gmail.com Test 4
;PM
###PAYLOAD_END
pú
###PLISTEN: Level: 3:
###STATUS: SL: 3, CYC: 1, RQ: 0, REV: 1, LSB: 0, dF: 16.6, CRC: AEC5, FRCNT: 3,
FRNR: 69
###PAYLOAD1: LEN: 276, TYPE: 0
###PAYLOAD2:
: KX4Z 01WXNGMTWL8W 847 docvacuumtubes@gmail.com Test 5
;PM: KX4Z 9APR28GZ29VN 2381 W4AKH@winlink.org //WL2K FL WLNK Net - Check in
Report - CORRECTED
;PM: KX4Z Y275JQ0NZ01E 17459 docvacuumtubes@gmail.com Test six, George
Washington
;PM: KX4Z ODOWBEOID7G8 197 docvacuumtubes@g
###PAYLOAD_END
pú
###PLISTEN: Level: 3:
###STATUS: SL: 3, CYC: 1, RQ: 0, REV: 0, LSB: 0, dF: 16.7, CRC: D24A, FRCNT: 0,
FRNR: 70
###PAYLOAD1: LEN: 276, TYPE: 0
###PAYLOAD2:
mail.com Test 3
;PM: KX4Z KATRLV3KNRBU 292 docvacuumtubes@gmail.com Test 4
;PM: KX4Z 01WXNGMTWL8W 847 docvacuumtubes@gmail.com Test 5
;PM: KX4Z 9APR28GZ29VN 2381 W4AKH@winlink.org //WL2K FL WLNK Net - Check in
Report - CORRECTED
;PM: KX4Z Y275JQ0NZ01E 17459 docvacuumtubes@gma
###PAYLOAD_END
pú
###PLISTEN: Level: 3:
###STATUS: SL: 4, CYC: 1, RQ: 0, REV: 1, LSB: 0, dF: 16.9, CRC: 8F37, FRCNT: 1,
FRNR: 71
###PAYLOAD1: LEN: 74, TYPE: 0
###PAYLOAD2:
il.com Test six, George Washington
FC EM Y275JQ0NZ01E 37290 17459 0
F> E9

###PAYLOAD_END
pú
###PLISTEN: Level: 3:
###STATUS: SL: 4, CYC: 1, RQ: 0, REV: 0, LSB: 0, dF: 16.7, CRC: 5BF1, FRCNT: 2,
FRNR: 72
###PAYLOAD1: LEN: 0, TYPE: 0
###PAYLOAD2:

###PAYLOAD_END
pú
###PLISTEN: Level: 3:
###STATUS: SL: 3, CYC: 0, RQ: 0, REV: 1, LSB: 0, dF: 16.8, CRC: 3C47, FRCNT: 1,
FRNR: 73
###PAYLOAD1: LEN: 2, TYPE: 0
###PAYLOAD2:

```


Y

###PAYLOAD_END

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###PLISTEN: Level: 3:

###STATUS: SL: 3, CYC: 0, RQ: 0, REV: 0, LSB: 0, dF: 16.6, CRC: 2684, FRCNT: 2, FRNR: 74

###PAYLOAD1: LEN: 0, TYPE: 0

###PAYLOAD2:

###PAYLOAD_END

þú

###PLISTEN: Level: 3:

###STATUS: SL: 3, CYC: 0, RQ: 0, REV: 1, LSB: 0, dF: 16.6, CRC: 7509, FRCNT: 3, FRNR: 75

###PAYLOAD1: LEN: 0, TYPE: 0

###PAYLOAD2:

###PAYLOAD_END

þú

###PLISTEN: Level: 3:

###STATUS: SL: 3, CYC: 0, RQ: 0, REV: 0, LSB: 0, dF: 16.4, CRC: B981, FRCNT: 1, FRNR: 76

###PAYLOAD1: LEN: 58, TYPE: 8

###PAYLOAD2:

54,65,73,74,20,73,69,78,2C,20,47,65,6F,72,67,65,20,57,61,73,68,69,6E,67,74,6F,6E,00,30,00,02,FA,25,41,AA,91,00,00,EC,F5,7A,1C,6D,67,97,7D,C3,E0,F5,BB,BB,CE,D7,9A,EB,7B,D1,CC

###PAYLOAD_END

þú

###PLISTEN: Level: 3:

###STATUS: SL: 3, CYC: 0, RQ: 0, REV: 1, LSB: 0, dF: 16.3, CRC: A6C5, FRCNT: 2, FRNR: 77

###PAYLOAD1: LEN: 57, TYPE: 8

###PAYLOAD2:

E5,B0,FD,A0,1F,1C,2C,1B,FA,F6,FC,5D,DD,8A,EA,3A,53,C6,02,A8,D6,DF,DA,DA,74,BF,DF,BF,CD,4A,3D,FC,5F,07,72,2F,85,27,BC,0A,CE,70,06,6A,86,C9,F7,BA,BF,FF,CC,F9,BD,81,F5,FC,6E

###PAYLOAD_END

þú

###PLISTEN: Level: 3:

###STATUS: SL: 4, CYC: 0, RQ: 0, REV: 0, LSB: 0, dF: 16.3, CRC: C89C, FRCNT: 3, FRNR: 78

###PAYLOAD1: LEN: 118, TYPE: 8

###PAYLOAD2:

9F,BF,92,FD,F4,FC,58,28,F5,FC,9C,0B,88,90,E8,26,4B,FD,9D,46,74,FA,ED,A0,4B,3D,61,74,78,26,E1,CE,99,E8,D2,CA,2A,E7,8E,43,BF,A2,DF,D2,63,94,49,3C,E5,AB,AA,86,14,92,4D,03,F9,CC,4E,82,BE,3A,7B,E1,4C,F0,95,51,78,AE,6A,A1,D3,44,8C,34,C9,47,4C,A4,70,A6,3E,63,E7,84,80,93,2F,41,27,D3,14,10,3C,6C,F8,CF,00,12,37,BF,87,71,76,80,E4,70,30,23,70,69,0A,16,66,FC,47,3E

###PAYLOAD_END

þú

```
###PLISTEN: Level: 3:
###STATUS: SL: 4, CYC: 0, RQ: 0, REV: 1, LSB: 0, dF: 16.1, CRC: 9D81, FRCNT: 0,
FRNR: 79
###PAYLOAD1: LEN: 119, TYPE: 8
###PAYLOAD2:
32,30,11,F0,6E,18,70,81,74,9F,FB,F6,2F,62,0A,1F,1E,E9,B8,70,37,41,FB,DD,AF,13,7
8,E3,41,6D,67,C6,3E,73,8E,E8,46,78,43,6D,1D,7A,DF,20,F3,6B,DE,6A,20,02,FA,8E,B2
,CF,93,AF,BA,87,EF,6E,93,F3,C2,02,41,5D,CF,ED,F3,13,5B,61,11,FF,3F,33,EB,FA,D3,
56,38,71,2E,7B,4F,B4,58,49,D1,ED,8D,6B,0B,5B,90,F1,DE,56,4F,AD,9E,CA,55,EF,92,E
0,A1,AF,64,5C,BE,67,BE,5C,BA,88,F7,DD,EB
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###PAYLOAD_END

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###PLISTEN: Level: 3:
###STATUS: SL: 4, CYC: 1, RQ: 0, REV: 0, LSB: 0, dF: 16.2, CRC: 10C8, FRCNT: 1,
FRNR: 80
###PAYLOAD1: LEN: 533, TYPE: 8
###PAYLOAD2:
C5,5C,5F,DF,59,F4,28,62,23,36,43,AC,D8,FB,ED,97,17,E6,E9,0F,5D,C5,FD,F6,C5,85,3
B,49,26,4E,D4,0D,ED,66,CE,8A,DA,72,52,62,B5,65,81,29,76,CD,AB,EB,B0,CB,1A,D3,75
,19,C4,CF,93,7C,E2,A6,73,DB,17,E6,C2,CF,15,36,6F,B0,4D,12,9C,B2,F3,E2,25,E0,89,
F3,15,28,D2,CF,2C,4C,A2,8F,4C,31,AA,95,D3,96,32,CB,62,57,FA,06,8B,B0,96,7D,8C,2
E,8F,B7,0E,24,0B,E1,06,3D,51,35,A2,AA,93,5B,39,6F,9B,CF,8A,92,BD,48,65,52,06,8B
,D5,6D,D9,82,38,B5,54,5D,71,61,8F,4F,79,84,7D,32,4C,6C,5E,27,BD,B9,6A,91,94,98,
D0,01,25,1A,8A,66,A2,A1,0E,F5,34,09,92,AB,23,66,44,D4,DF,5A,C6,4D,4A,57,02,FA,3
B,52,B5,39,95,79,A9,E1,22,60,F6,C8,71,F5,66,0E,95,F9,90,8C,71,14,D2,19,27,52,28
,BF,D9,05,B1,75,2D,4D,10,A1,DE,A2,B5,21,08,39,70,30,E7,90,C6,08,0B,6D,E0,2A,F8,
B5,D0,11,55,5B,95,BD,D4,F9,5E,31,73,36,6A,CA,61,0E,34,D2,65,78,62,CA,D4,3F,94,B
1,33,8D,67,C9,04,03,3C,18,BA,2E,CD,65,81,23,B1,C7,66,0E,FF,D8,D9,E7,54,A9,63,28
,3A,ED,B2,16,0E,7E,A0,AC,6B,3A,1D,5C,50,43,26,89,0E,58,68,F7,38,44,C1,95,BD,C0,
BF,66,B8,42,E6,47,43,52,72,37,7A,C7,92,F5,8A,E1,1F,18,55,99,83,72,71,10,E7,E2,5
A,B4,11,FA,F9,81,AD,0B,1E,47,3D,7B,41,97,3C,EE,61,22,66,56,AF,58,95,F4,F3,56,0A
,FA,3F,FC,1D,38,C8,DF,92,6D,C5,45,63,03,7E,79,5F,41,2D,97,C5,A0,DB,AF,15,C6,0C,
F6,55,36,78,D3,64,2F,F2,56,E7,B3,71,9F,76,18,F9,35,40,FA,A8,76,AD,1D,81,3B,28,5
1,03,BB,EA,D9,0D,8A,6A,68,2D,7D,E9,CC,02,FA,2B,AC,FF,8D,19,63,BC,5A,EC,5E,AB,4A
,0D,59,FC,E8,F9,0B,C8,C1,20,C8,79,AC,2B,DF,71,24,3D,4E,40,F4,9E,85,BF,BE,48,F1,
5D,25,40,38,CC,50,E2,F6,DB,C5,74,93,F3,AE,AA,62,66,C7,C8,CF,96,CD,33,09,81,EA,F
B,D8,B7,CB,50,B1,16,70,24,F3,EF,47,2A,6A,B6,D4,E8,3E,97,70,09,79,3E,82,39,89,4A
,37,87,FB,B7,B6,8F
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###PAYLOAD_END

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###PLISTEN: Level: 3:
###STATUS: SL: 4, CYC: 1, RQ: 0, REV: 1, LSB: 0, dF: 16.2, CRC: E63A, FRCNT: 2,
FRNR: 81
###PAYLOAD1: LEN: 533, TYPE: 8
###PAYLOAD2:
76,22,5A,7B,8B,FE,B9,CA,16,9E,D3,11,A7,DF,B7,41,A0,C8,AF,50,5F,2A,FF,1C,12,5D,E
8,9B,D5,10,0E,25,29,62,0D,B8,25,18,A4,AC,CC,60,57,81,64,E4,DB,D2,E3,47,C9,6C,9E
,75,F9,07,7F,8D,A2,5E,FC,A3,5F,44,74,D8,3C,9F,F6,A3,84,EF,94,27,C7,01,CD,2B,F7,
0F,34,11,63,73,3D,C3,86,04,46,56,0E,82,97,0C,85,2E,F6,88,87,30,45,67,8C,84,8A,C
4,D6,9E,B1,71,22,83,1A,DF,C1,52,40,89,33,A5,0C,CC,93,C7,D2,9B,41,57,1D,E5,2B,60
,C9,71,57,92,02,27,20,E2,70,CE,D4,F1,9C,1A,B6,04,50,52,2D,67,C6,02,FA,79,8F,BB,
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F1,7C,F9,F4,42,EF,A9,FF,5E,71,95,0C,1C,0C,07,E5,70,4E,23,01,5D,B9,C0,FC,CF,54,7
5,BD,8E,9B,53,99,D7,6F,E7,3F,40,79,98,B7,F3,56,65,2E,7B,5A,6A,0C,8F,0A,F3,75,AE
,84,AE,98,F9,E0,69,B2,F9,E9,0A,EB,EC,A9,46,B9,01,5C,36,F8,D7,19,CA,B0,43,29,56,
2F,F7,AC,62,5C,2A,04,03,AD,21,F4,17,57,0E,EF,08,CE,AE,95,EC,7A,F0,D4,DC,B3,5A,D
F,D4,6A,D0,15,65,6E,E1,CD,D4,77,2F,65,B2,DC,EE,A5,F7,F6,C7,1D,23,B7,BE,11,38,F1
,FE,53,35,44,5F,5A,CD,C4,0F,6C,C0,5F,FD,6C,66,8A,E4,84,B5,26,E9,6B,D4,A5,A9,15,
25,FB,EC,BC,C8,C5,F0,21,AF,37,9C,79,3C,8E,28,22,7A,DB,16,F7,58,BB,59,98,56,4F,A
4,CB,2C,E7,D9,E7,4C,07,E7,32,03,16,BE,B1,72,72,7C,93,C5,2B,D3,24,26,6F,83,45,9D
,D8,13,BC,EE,ED,2E,8E,5C,D4,64,92,ED,26,28,2F,82,0F,7F,E2,2B,81,24,6A,91,DA,D1,
33,78,2E,19,0C,5B,96,AC,47,B9,02,FA,19,DB,15,9E,D3,4A,95,06,D3,45,28,19,93,AE,2
5,EB,C7,B6,D2,09,1A,5B,51,82,15,31,93,48,33,6C,62,49,0B,8F,92,5A,95,AA,96,92,C7
,AD,79,AB,D2,B9,F7,BC,9A,A7,67,51,2F,8D,17,2C,72,82,72,EB,27,CD,ED,11,C0,63,DD,
AD,5E,46,31,7F,9A,32,9B,9E,FB,24,5B,7C,6B,B2,CF,7D,5E,30,E6,A8,1B,60,B2,A8,0F,3
C,5D,98,D3,3D,CC,7F,7C,9A,9E,D9,E4,C6,EF,B5,BC,AA,B5,CA,AB,14,C6,4B,A7,81,AB,26
,3D,4E,1D,3E,6E,AA

###PAYLOAD_END

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###PLISTEN: Level: 3: MISSED ONE!!!

###STATUS: SL: 5, CYC: 1, RQ: 0, REV: 1, LSB: 0, dF: 16.2, CRC: DC15, FRCNT: 0,
FRNR: 82

###PAYLOAD1: LEN: 921, TYPE: 8

###PAYLOAD2:

C8,77,59,D6,C3,9E,BD,F0,3C,2E,17,EA,CF,8E,3A,CB,BA,F8,6A,C6,C3,63,5C,E7,5F,E4,A
3,CD,85,F7,1A,BE,4F,53,24,49,95,0F,23,B4,DA,D8,F6,FD,E5,1B,D0,87,77,29,6B,BC,40
,4A,A5,F1,67,CD,EE,E5,63,5C,66,E0,AD,9E,37,FB,EE,F5,90,6C,87,B3,71,99,3D,FD,E4,
32,E6,A2,3E,7E,85,C7,CC,6F,9A,3F,99,ED,CB,DB,0A,6B,65,EF,88,F4,F6,96,3B,F2,8A,1
7,5C,70,7C,A1,6C,52,3C,5B,F6,0B,9F,9D,B4,7A,88,AB,FC,C5,CF,99,E0,06,98,B9,E8,7C
,D1,24,D0,BE,94,7E,25,F9,50,5F,1D,A6,5B,48,E7,68,2F,B4,3C,56,4D,D5,FF,DC,85,2F,
74,0B,18,DA,2B,BA,E1,88,3C,31,51,7D,D5,F9,24,B0,8E,54,FE,34,75,5C,5D,3F,68,5C,0
7,86,2C,26,34,E8,F8,D4,6F,C6,A6,AD,0D,30,A9,E2,36,17,98,C0,8A,60,22,1C,1E,4C,45
,5E,97,DA,A6,7C,CB,EE,05,33,02,FA,63,E0,BD,89,2A,40,95,F9,44,77,61,F3,76,C7,2B,
FB,E8,31,B4,E2,3B,2E,87,6E,FE,74,73,1B,27,9C,EA,3C,B8,EA,51,4F,72,29,4C,7D,64,5
B,2F,3A,21,F8,B0,B1,4C,5D,B9,5A,F9,25,E4,17,C3,E6,D4,84,52,FE,D2,A2,7B,F1,28,8F
,BC,F5,20,FA,6C,01,D5,62,C0,96,AD,A8,E5,16,C3,AC,26,3C,9B,F1,B2,90,D5,32,FF,4C,
8C,61,EE,48,D3,0F,29,4D,D5,BF,6C,47,86,42,12,73,A5,70,A2,26,E7,2F,D8,E9,5E,27,8
4,6A,D0,EC,B1,29,9D,68,96,46,49,A5,0A,35,22,51,17,42,C6,2B,3B,2C,74,AC,D1,49,58
,29,01,67,BD,FE,4E,A5,79,91,16,48,56,29,93,AC,78,2B,D1,A2,98,62,2D,45,0B,6F,F6,
94,3A,1A,BB,3E,20,E4,CB,59,0E,BB,11,5D,82,F4,7B,B9,71,6A,26,42,BE,39,AB,CA,D4,3
1,E1,D8,DF,D2,0C,D3,21,68,6C,C8,CF,2A,0B,10,6F,70,60,4B,AB,3F,8E,DA,14,CF,FB,E3
,BC,A5,D5,BB,36,75,79,05,78,CB,7D,CC,63,58,39,1A,25,D2,57,DE,49,A0,96,61,02,FA,
0F,AB,73,20,EC,2B,B0,69,D7,96,29,97,47,DB,46,12,C2,F6,6E,F2,93,72,DF,DD,4A,5A,6
6,4F,21,74,E4,DE,1F,CA,BA,2F,7F,5E,17,CA,81,EC,9C,C0,39,30,FD,36,63,3E,74,A4,4D
,1C,B7,6E,10,E3,1A,7E,0A,00,73,38,7C,62,A0,4F,71,71,EF,D5,86,65,2B,D8,B9,49,E9,
CF,76,2D,31,2D,23,A2,E6,22,EC,86,B3,86,4B,55,F6,75,72,F5,9D,DA,DF,06,3A,64,D4,9
D,DC,FB,0A,6A,F0,A8,09,CF,EA,5E,74,68,FC,52,93,18,B8,87,C8,44,08,51,7B,58,A2,FD
,57,C2,CB,99,5D,9D,3C,44,A9,C5,4F,F5,2E,8C,F8,5C,05,78,7C,4F,D1,7C,1B,F0,64,BF,
A2,72,0C,2D,FD,16,07,2F,7C,32,F5,14,F2,16,E4,DA,74,27,6B,D7,8B,1F,A8,93,A4,8B,C
A,B7,32,38,EE,28,12,32,D6,28,9E,CD,AD,0C,79,85,DC,64,3C,80,1B,9E,5E,2F,48,FF,60
,47,EB,99,A4,BB,C7,B3,C6,36,FB,9F,1E,AC,13,BC,DC,A4,09,C4,61,EF,FA,CE,1E,36,B9,
A7,A7,EF,16,D9,6A,6B,31,BF,0C,A4,0C,7E,02,FA,D1,C6,69,CE,DB,89,1B,0C,B2,F4,D4,7
4,25,11,4F,9F,64,33,17,BF,E7,9F,E7,E9,0D,F3,72,53,92,BD,70,41,BB,6D,76,E8,03,E9
,B4,40,EB,E6,74,B3,E9,2D,4F,83,55,AD,86,19,63,EC,3D,89,9B,77,BE,E9,8B,E7,4C,55,
57,12,9B,87,67,DF,3C,9F,01,0C,EC,56,49,93,1C,82,79,5F,59,96,EE,5E,CF,CF,37,DF,9

3,90,18,36,06,B3,D7,9C,17,A5,54,EC,0E,0F,3D,8C,23,5D,2F,7F,AE,A8,AC,9E,69,95,33,71,85,7E,15,00,FD,0A,9B,F6,B9,4B,65,73,E7,15,DB,6B,E8,0B,91,5B,ED,7A,AF,B3,52,BA,A0,89,D8,29,C3,86,11,77,93,64,78,E2,A0,73,8C,9D,DB,7F,61,8A,92,53,E5,C6,9C,30,0B,99,21,2B,D6,EB,EE,11,5C,D1,AB,9B,3E,A7,22,BB,B4,88,56,63,7C,95,1C,59,E1

###PAYLOAD_END

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###PLISTEN: Level: 3:

###STATUS: SL: 5, CYC: 1, RQ: 1, REV: 0, LSB: 0, dF: 16.4, CRC: DC15, FRCNT: 0, FRNR: 83

###PAYLOAD1: LEN: 921, TYPE: 8

###PAYLOAD2:

C8,77,59,D6,C3,9E,BD,F0,3C,2E,17,EA,CF,8E,3A,CB,BA,F8,6A,C6,C3,63,5C,E7,5F,E4,A3,CD,85,F7,1A,BE,4F,53,24,49,95,0F,23,B4,DA,D8,F6,FD,E5,1B,D0,87,77,29,6B,BC,40,4A,A5,F1,67,CD,EE,E5,63,5C,66,E0,AD,9E,37,FB,EE,F5,90,6C,87,B3,71,99,3D,FD,E4,32,E6,A2,3E,7E,85,C7,CC,6F,9A,3F,99,ED,CB,DB,0A,6B,65,EF,88,F4,F6,96,3B,F2,8A,17,5C,70,7C,A1,6C,52,3C,5B,F6,0B,9F,9D,B4,7A,88,AB,FC,C5,CF,99,E0,06,98,B9,E8,7C,D1,24,D0,BE,94,7E,25,F9,50,5F,1D,A6,5B,48,E7,68,2F,B4,3C,56,4D,D5,FF,DC,85,2F,74,0B,18,DA,2B,BA,E1,88,3C,31,51,7D,D5,F9,24,B0,8E,54,FE,34,75,5C,5D,3F,68,5C,07,86,2C,26,34,E8,F8,D4,6F,C6,A6,AD,0D,30,A9,E2,36,17,98,C0,8A,60,22,1C,1E,4C,45,5E,97,DA,A6,7C,CB,EE,05,33,02,FA,63,E0,BD,89,2A,40,95,F9,44,77,61,F3,76,C7,2B,FB,E8,31,B4,E2,3B,2E,87,6E,FE,74,73,1B,27,9C,EA,3C,B8,EA,51,4F,72,29,4C,7D,64,5B,2F,3A,21,F8,B0,B1,4C,5D,B9,5A,F9,25,E4,17,C3,E6,D4,84,52,FE,D2,A2,7B,F1,28,8F,BC,F5,20,FA,6C,01,D5,62,C0,96,AD,A8,E5,16,C3,AC,26,3C,9B,F1,B2,90,D5,32,FF,4C,8C,61,EE,48,D3,0F,29,4D,D5,BF,6C,47,86,42,12,73,A5,70,A2,26,E7,2F,D8,E9,5E,27,84,6A,D0,EC,B1,29,9D,68,96,46,49,A5,0A,35,22,51,17,42,C6,2B,3B,2C,74,AC,D1,49,58,29,01,67,BD,FE,4E,A5,79,91,16,48,56,29,93,AC,78,2B,D1,A2,98,62,2D,45,0B,6F,F6,94,3A,1A,BB,3E,20,E4,CB,59,0E,BB,11,5D,82,F4,7B,B9,71,6A,26,42,BE,39,AB,CA,D4,31,E1,D8,DF,D2,0C,D3,21,68,6C,C8,CF,2A,0B,10,6F,70,60,4B,AB,3F,8E,DA,14,CF,FB,E3,BC,A5,D5,BB,36,75,79,05,78,CB,7D,CC,63,58,39,1A,25,D2,57,DE,49,A0,96,61,02,FA,0F,AB,73,20,EC,2B,B0,69,D7,96,29,97,47,DB,46,12,C2,F6,6E,F2,93,72,DF,DD,4A,5A,66,4F,21,74,E4,DE,1F,CA,BA,2F,7F,5E,17,CA,81,EC,9C,C0,39,30,FD,36,63,3E,74,A4,4D,1C,B7,6E,10,E3,1A,7E,0A,00,73,38,7C,62,A0,4F,71,71,EF,D5,86,65,2B,D8,B9,49,E9,CF,76,2D,31,2D,23,A2,E6,22,EC,86,B3,86,4B,55,F6,75,72,F5,9D,DA,DF,06,3A,64,D4,9D,DC,FB,0A,6A,F0,A8,09,CF,EA,5E,74,68,FC,52,93,18,B8,87,C8,44,08,51,7B,58,A2,FD,57,C2,CB,99,5D,9D,3C,44,A9,C5,4F,F5,2E,8C,F8,5C,05,78,7C,4F,D1,7C,1B,F0,64,BF,A2,72,0C,2D,FD,16,07,2F,7C,32,F5,14,F2,16,E4,DA,74,27,6B,D7,8B,1F,A8,93,A4,8B,CA,B7,32,38,EE,28,12,32,D6,28,9E,CD,AD,0C,79,85,DC,64,3C,80,1B,9E,5E,2F,48,FF,60,47,EB,99,A4,BB,C7,B3,C6,36,FB,9F,1E,AC,13,BC,DC,A4,09,C4,61,EF,FA,CE,1E,36,B9,A7,A7,EF,16,D9,6A,6B,31,BF,0C,A4,0C,7E,02,FA,D1,C6,69,CE,DB,89,1B,0C,B2,F4,D4,74,25,11,4F,9F,64,33,17,BF,E7,9F,E7,E9,0D,F3,72,53,92,BD,70,41,BB,6D,76,E8,03,E9,B4,40,EB,E6,74,B3,E9,2D,4F,83,55,AD,86,19,63,EC,3D,89,9B,77,BE,E9,8B,E7,4C,55,57,12,9B,87,67,DF,3C,9F,01,0C,EC,56,49,93,1C,82,79,5F,59,96,EE,5E,CF,CF,37,DF,93,90,18,36,06,B3,D7,9C,17,A5,54,EC,0E,0F,3D,8C,23,5D,2F,7F,AE,A8,AC,9E,69,95,33,71,85,7E,15,00,FD,0A,9B,F6,B9,4B,65,73,E7,15,DB,6B,E8,0B,91,5B,ED,7A,AF,B3,52,BA,A0,89,D8,29,C3,86,11,77,93,64,78,E2,A0,73,8C,9D,DB,7F,61,8A,92,53,E5,C6,9C,30,0B,99,21,2B,D6,EB,EE,11,5C,D1,AB,9B,3E,A7,22,BB,B4,88,56,63,7C,95,1C,59,E1

###PAYLOAD_END

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###PLISTEN: Level: 3:

###STATUS: SL: 5, CYC: 1, RQ: 0, REV: 1, LSB: 0, dF: 16.6, CRC: 7DB4, FRCNT: 1, FRNR: 84

###PAYLOAD1: LEN: 920, TYPE: 8

###PAYLOAD2:

1D,42,39,E6,26,9E,60,89,81,7A,E4,D5,F3,57,B6,0F,67,CA,AC,8F,E2,73,01,38,C5,16,2
B,EB,26,1B,15,C7,C9,A8,92,E2,7E,EC,5D,9B,4F,1F,41,24,3A,2A,EC,68,D0,8A,19,6A,61
,77,92,02,FA,49,D3,83,D8,40,6B,D3,0A,E2,33,D2,52,5D,CE,1D,6C,7C,FD,1A,FD,40,CD,
BB,A9,1A,C8,8A,63,A3,A7,B1,93,1B,39,DE,71,8A,CC,64,66,37,B0,71,C1,32,1E,D3,A3,0
A,7F,4E,55,56,E9,80,C9,7F,11,7C,AC,42,76,38,96,9C,F7,0A,9B,DA,7B,B3,20,C6,0C,31
,E7,5C,72,F2,9E,7C,C8,3B,38,0A,CD,4C,A7,D2,20,1A,2C,83,48,60,30,2F,77,E4,CE,0D,
9B,77,9A,6C,39,2F,26,F2,8F,10,57,4E,C6,F4,CE,27,CC,17,A3,97,EA,33,06,5F,8B,D9,E
2,06,28,CE,CA,84,0C,BC,E2,9F,C9,C0,9C,2F,15,A9,B5,70,19,D6,1A,6C,FC,0E,94,B1,A8
,85,E1,F0,15,91,18,5C,C5,98,D7,45,E2,AF,AC,45,6A,63,14,A2,D3,33,F2,F9,24,BD,33,
4F,13,28,F6,8E,03,E7,17,DA,3C,B3,40,92,C5,AF,6C,C3,65,08,C2,99,A3,69,9A,69,97,9
8,FE,42,4A,D1,DE,86,5A,6D,3F,97,63,70,A4,C2,44,05,6C,DD,DE,E1,5C,E6,DF,CA,71,79
,A3,15,3F,29,16,82,A2,31,B4,E1,2F,4A,52,EF,79,CB,7C,02,FA,36,0A,81,45,C2,03,E4,
C5,58,66,A0,16,E3,30,F3,E0,99,21,AD,B6,2A,66,EF,B7,66,45,F9,3F,19,0E,18,12,7D,1
2,75,B6,CC,6C,2B,15,70,B2,E6,ED,6B,C7,1E,69,B4,87,90,5A,95,FF,30,2E,5B,19,33,85
,F3,C2,2A,EB,6A,38,CF,19,A8,3E,40,64,78,B7,8F,98,A1,9E,01,2A,5B,64,CD,3A,9F,8F,
6C,30,9E,FA,93,B3,93,24,30,21,9A,3B,2B,32,88,57,37,DA,E8,CB,61,DE,3E,72,E2,23,A
7,D5,C9,0A,89,F4,D7,6A,45,EA,FD,65,7D,91,2B,55,38,65,D3,D6,8F,E6,08,3B,FE,E3,0A
,07,F8,AB,E2,3C,FD,D0,43,18,E4,8A,5F,26,C9,95,CA,90,4E,FB,87,24,C7,27,E0,71,9B,
39,24,21,86,4A,A0,27,E8,83,C2,C5,5C,BE,CD,7E,0B,5A,EC,DE,54,32,30,73,ED,BB,CA,4
F,C7,B6,12,10,F6,A0,1F,40,BA,66,27,0C,B8,13,64,27,C4,E3,5F,B5,EF,7F,CA,AC,D3,A4
,30,9C,74,4C,49,A8,FD,F5,DD,92,60,79,40,C2,48,D9,2A,A7,1A,47,C5,08,EB,16,FF,7E,
D8,AD,62,C3,44,72,02,FA,97,55,48,35,8A,E7,9C,6B,0B,58,3F,0E,21,9D,F3,4B,5D,8E,7
9,9B,8D,6F,C8,73,5B,2C,61,99,4B,08,43,F0,CC,AD,0C,68,78,30,35,78,DA,1E,4F,F8,74
,2C,91,2C,01,8C,7F,04,2D,59,18,B6,DB,46,79,D6,6F,7C,2A,D2,94,61,78,D8,97,E1,EA,
8F,D5,14,A2,67,06,A8,6C,3B,16,00,7B,30,D8,89,6E,91,31,96,3A,B2,9C,A1,7F,F9,6F,9
B,D6,65,21,21,4E,68,91,CC,94,63,27,67,91,68,4A,AF,09,DF,9E,78,A6,D4,A9,F8,44,F7
,53,13,7A,C0,2A,B3,48,2A,59,04,A4,54,DA,C3,FB,49,AD,F6,AC,A6,0E,10,94,6B,98,12,
A7,E1,21,05,9A,0B,CE,98,E7,2F,55,12,9F,6F,A6,55,61,33,E1,E5,AB,54,14,FC,C9,18,8
F,7F,D6,72,46,A2,1B,B6,D5,83,1B,0B,D2,2D,14,47,7D,B8,2F,22,8D,5A,6F,75,6E,15,32
,02,E3,A9,11,B1,24,C1,DC,45,33,1C,41,51,AA,9B,21,94,2D,B0,BC,95,E5,96,3C,55,88,
99,13,14,22,BB,DE,EF,5A,B9,09,39,45,41,E8,69,E7,8C,4A,29,1B,C2,02,FA,D2,A2,77,5
D,F9,81,12,54,E9,44,59,98,9D,ED,4E,75,DE,AE,39,35,62,7D,70,37,24,13,B7,D5,72,54
,95,60,DF,23,9F,7D,6B,07,5F,F0,B0,9C,4E,26,08,6F,FC,6E,60,A0,27,DA,D4,0A,58,AE,
0D,50,F4,57,00,30,C1,C4,26,F6,54,94,35,D4,DA,BE,01,FD,FB,CF,04,B6,02,82,E7,63,8
E,AF,E8,36,2F,F3,A7,C8,E5,1C,B3,87,6B,AC,BB,85,58,D1,7A,99,B0,53,4B,0E,75

###PAYLOAD_END

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###PLISTEN: Level: 3:

###STATUS: SL: 5, CYC: 1, RQ: 1, REV: 0, LSB: 0, dF: 16.8, CRC: 7DB4, FRCNT: 1,
FRNR: 85

###PAYLOAD1: LEN: 920, TYPE: 8

###PAYLOAD2:

1D,42,39,E6,26,9E,60,89,81,7A,E4,D5,F3,57,B6,0F,67,CA,AC,8F,E2,73,01,38,C5,16,2
B,EB,26,1B,15,C7,C9,A8,92,E2,7E,EC,5D,9B,4F,1F,41,24,3A,2A,EC,68,D0,8A,19,6A,61
,77,92,02,FA,49,D3,83,D8,40,6B,D3,0A,E2,33,D2,52,5D,CE,1D,6C,7C,FD,1A,FD,40,CD,
BB,A9,1A,C8,8A,63,A3,A7,B1,93,1B,39,DE,71,8A,CC,64,66,37,B0,71,C1,32,1E,D3,A3,0
A,7F,4E,55,56,E9,80,C9,7F,11,7C,AC,42,76,38,96,9C,F7,0A,9B,DA,7B,B3,20,C6,0C,31
,E7,5C,72,F2,9E,7C,C8,3B,38,0A,CD,4C,A7,D2,20,1A,2C,83,48,60,30,2F,77,E4,CE,0D,
9B,77,9A,6C,39,2F,26,F2,8F,10,57,4E,C6,F4,CE,27,CC,17,A3,97,EA,33,06,5F,8B,D9,E
2,06,28,CE,CA,84,0C,BC,E2,9F,C9,C0,9C,2F,15,A9,B5,70,19,D6,1A,6C,FC,0E,94,B1,A8
,85,E1,F0,15,91,18,5C,C5,98,D7,45,E2,AF,AC,45,6A,63,14,A2,D3,33,F2,F9,24,BD,33,
4F,13,28,F6,8E,03,E7,17,DA,3C,B3,40,92,C5,AF,6C,C3,65,08,C2,99,A3,69,9A,69,97,9
8,FE,42,4A,D1,DE,86,5A,6D,3F,97,63,70,A4,C2,44,05,6C,DD,DE,E1,5C,E6,DF,CA,71,79
,A3,15,3F,29,16,82,A2,31,B4,E1,2F,4A,52,EF,79,CB,7C,02,FA,36,0A,81,45,C2,03,E4,
C5,58,66,A0,16,E3,30,F3,E0,99,21,AD,B6,2A,66,EF,B7,66,45,F9,3F,19,0E,18,12,7D,1
2,75,B6,CC,6C,2B,15,70,B2,E6,ED,6B,C7,1E,69,B4,87,90,5A,95,FF,30,2E,5B,19,33,85
,F3,C2,2A,EB,6A,38,CF,19,A8,3E,40,64,78,B7,8F,98,A1,9E,01,2A,5B,64,CD,3A,9F,8F,
6C,30,9E,FA,93,B3,93,24,30,21,9A,3B,2B,32,88,57,37,DA,E8,CB,61,DE,3E,72,E2,23,A
7,D5,C9,0A,89,F4,D7,6A,45,EA,FD,65,7D,91,2B,55,38,65,D3,D6,8F,E6,08,3B,FE,E3,0A
,07,F8,AB,E2,3C,FD,D0,43,18,E4,8A,5F,26,C9,95,CA,90,4E,FB,87,24,C7,27,E0,71,9B,
39,24,21,86,4A,A0,27,E8,83,C2,C5,5C,BE,CD,7E,0B,5A,EC,DE,54,32,30,73,ED,BB,CA,4
F,C7,B6,12,10,F6,A0,1F,40,BA,66,27,0C,B8,13,64,27,C4,E3,5F,B5,EF,7F,CA,AC,D3,A4
,30,9C,74,4C,49,A8,FD,F5,DD,92,60,79,40,C2,48,D9,2A,A7,1A,47,C5,08,EB,16,FF,7E,
D8,AD,62,C3,44,72,02,FA,97,55,48,35,8A,E7,9C,6B,0B,58,3F,0E,21,9D,F3,4B,5D,8E,7
9,9B,8D,6F,C8,73,5B,2C,61,99,4B,08,43,F0,CC,AD,0C,68,78,30,35,78,DA,1E,4F,F8,74
,2C,91,2C,01,8C,7F,04,2D,59,18,B6,DB,46,79,D6,6F,7C,2A,D2,94,61,78,D8,97,E1,EA,
8F,D5,14,A2,67,06,A8,6C,3B,16,00,7B,30,D8,89,6E,91,31,96,3A,B2,9C,A1,7F,F9,6F,9
B,D6,65,21,21,4E,68,91,CC,94,63,27,67,91,68,4A,AF,09,DF,9E,78,A6,D4,A9,F8,44,F7
,53,13,7A,C0,2A,B3,48,2A,59,04,A4,54,DA,C3,FB,49,AD,F6,AC,A6,0E,10,94,6B,98,12,
A7,E1,21,05,9A,0B,CE,98,E7,2F,55,12,9F,6F,A6,55,61,33,E1,E5,AB,54,14,FC,C9,18,8
F,7F,D6,72,46,A2,1B,B6,D5,83,1B,0B,D2,2D,14,47,7D,B8,2F,22,8D,5A,6F,75,6E,15,32
,02,E3,A9,11,B1,24,C1,DC,45,33,1C,41,51,AA,9B,21,94,2D,B0,BC,95,E5,96,3C,55,88,
99,13,14,22,BB,DE,EF,5A,B9,09,39,45,41,E8,69,E7,8C,4A,29,1B,C2,02,FA,D2,A2,77,5
D,F9,81,12,54,E9,44,59,98,9D,ED,4E,75,DE,AE,39,35,62,7D,70,37,24,13,B7,D5,72,54
,95,60,DF,23,9F,7D,6B,07,5F,F0,B0,9C,4E,26,08,6F,FC,6E,60,A0,27,DA,D4,0A,58,AE,
0D,50,F4,57,00,30,C1,C4,26,F6,54,94,35,D4,DA,BE,01,FD,FB,CF,04,B6,02,82,E7,63,8
E,AF,E8,36,2F,F3,A7,C8,E5,1C,B3,87,6B,AC,BB,85,58,D1,7A,99,B0,53,4B,0E,75

8, FE, 42, 4A, D1, DE, 86, 5A, 6D, 3F, 97, 63, 70, A4, C2, 44, 05, 6C, DD, DE, E1, 5C, E6, DF, CA, 71, 79
, A3, 15, 3F, 29, 16, 82, A2, 31, B4, E1, 2F, 4A, 52, EF, 79, CB, 7C, 02, FA, 36, 0A, 81, 45, C2, 03, E4,
C5, 58, 66, A0, 16, E3, 30, F3, E0, 99, 21, AD, B6, 2A, 66, EF, B7, 66, 45, F9, 3F, 19, 0E, 18, 12, 7D, 1
2, 75, B6, CC, 6C, 2B, 15, 70, B2, E6, ED, 6B, C7, 1E, 69, B4, 87, 90, 5A, 95, FF, 30, 2E, 5B, 19, 33, 85
, F3, C2, 2A, EB, 6A, 38, CF, 19, A8, 3E, 40, 64, 78, B7, 8F, 98, A1, 9E, 01, 2A, 5B, 64, CD, 3A, 9F, 8F,
6C, 30, 9E, FA, 93, B3, 93, 24, 30, 21, 9A, 3B, 2B, 32, 88, 57, 37, DA, E8, CB, 61, DE, 3E, 72, E2, 23, A
7, D5, C9, 0A, 89, F4, D7, 6A, 45, EA, FD, 65, 7D, 91, 2B, 55, 38, 65, D3, D6, 8F, E6, 08, 3B, FE, E3, 0A
, 07, F8, AB, E2, 3C, FD, D0, 43, 18, E4, 8A, 5F, 26, C9, 95, CA, 90, 4E, FB, 87, 24, C7, 27, E0, 71, 9B,
39, 24, 21, 86, 4A, A0, 27, E8, 83, C2, C5, 5C, BE, CD, 7E, 0B, 5A, EC, DE, 54, 32, 30, 73, ED, BB, CA, 4
F, C7, B6, 12, 10, F6, A0, 1F, 40, BA, 66, 27, 0C, B8, 13, 64, 27, C4, E3, 5F, B5, EF, 7F, CA, AC, D3, A4
, 30, 9C, 74, 4C, 49, A8, FD, F5, DD, 92, 60, 79, 40, C2, 48, D9, 2A, A7, 1A, 47, C5, 08, EB, 16, FF, 7E,
D8, AD, 62, C3, 44, 72, 02, FA, 97, 55, 48, 35, 8A, E7, 9C, 6B, 0B, 58, 3F, 0E, 21, 9D, F3, 4B, 5D, 8E, 7
9, 9B, 8D, 6F, C8, 73, 5B, 2C, 61, 99, 4B, 08, 43, F0, CC, AD, 0C, 68, 78, 30, 35, 78, DA, 1E, 4F, F8, 74
, 2C, 91, 2C, 01, 8C, 7F, 04, 2D, 59, 18, B6, DB, 46, 79, D6, 6F, 7C, 2A, D2, 94, 61, 78, D8, 97, E1, EA,
8F, D5, 14, A2, 67, 06, A8, 6C, 3B, 16, 00, 7B, 30, D8, 89, 6E, 91, 31, 96, 3A, B2, 9C, A1, 7F, F9, 6F, 9
B, D6, 65, 21, 21, 4E, 68, 91, CC, 94, 63, 27, 67, 91, 68, 4A, AF, 09, DF, 9E, 78, A6, D4, A9, F8, 44, F7
, 53, 13, 7A, C0, 2A, B3, 48, 2A, 59, 04, A4, 54, DA, C3, FB, 49, AD, F6, AC, A6, 0E, 10, 94, 6B, 98, 12,
A7, E1, 21, 05, 9A, 0B, CE, 98, E7, 2F, 55, 12, 9F, 6F, A6, 55, 61, 33, E1, E5, AB, 54, 14, FC, C9, 18, 8
F, 7F, D6, 72, 46, A2, 1B, B6, D5, 83, 1B, 0B, D2, 2D, 14, 47, 7D, B8, 2F, 22, 8D, 5A, 6F, 75, 6E, 15, 32
, 02, E3, A9, 11, B1, 24, C1, DC, 45, 33, 1C, 41, 51, AA, 9B, 21, 94, 2D, B0, BC, 95, E5, 96, 3C, 55, 88,
99, 13, 14, 22, BB, DE, EF, 5A, B9, 09, 39, 45, 41, E8, 69, E7, 8C, 4A, 29, 1B, C2, 02, FA, D2, A2, 77, 5
D, F9, 81, 12, 54, E9, 44, 59, 98, 9D, ED, 4E, 75, DE, AE, 39, 35, 62, 7D, 70, 37, 24, 13, B7, D5, 72, 54
, 95, 60, DF, 23, 9F, 7D, 6B, 07, 5F, F0, B0, 9C, 4E, 26, 08, 6F, FC, 6E, 60, A0, 27, DA, D4, 0A, 58, AE,
0D, 50, F4, 57, 00, 30, C1, C4, 26, F6, 54, 94, 35, D4, DA, BE, 01, FD, FB, CF, 04, B6, 02, 82, E7, 63, 8
E, AF, E8, 36, 2F, F3, A7, C8, E5, 1C, B3, 87, 6B, AC, BB, 85, 58, D1, 7A, 99, B0, 53, 4B, 0E, 75

###PAYLOAD_END

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###PLISTEN: Level: 3:

###STATUS: SL: 5, CYC: 1, RQ: 0, REV: 1, LSB: 0, dF: 17.2, CRC: D84D, FRCNT: 2,
FRNR: 86

###PAYLOAD1: LEN: 922, TYPE: 8

###PAYLOAD2:

E9, 63, 24, C3, 3B, 21, A1, 7A, 25, AF, C5, E2, 96, 4A, 87, E9, B9, 0B, 78, 6C, 37, 51, 7E, A7, 12, 3F, 1
1, DB, 2C, 8C, FB, 49, 26, C8, A9, B2, B9, 8D, FD, 30, A1, 78, D3, 65, 14, 09, 7A, F6, 05, 92, 0A, C5, D4
, 5A, 92, 43, 7C, 19, 5D, A0, F4, AB, D6, AB, 60, 51, 90, 72, D3, BE, 5D, AC, E3, B7, 78, 71, 6A, 55, AA,
43, F3, 30, BD, EE, 61, 95, 41, E3, 01, A8, DD, F4, C8, 21, 05, AA, 68, D9, 74, 6E, 4E, 76, 36, 28, FC, B
4, A7, 68, B9, B5, 5D, AB, 13, F3, 50, 0C, F8, E6, 43, 04, BC, 47, B5, 33, 4B, 93, 67, E0, 63, 83, A1, 7E
, 1E, DB, A2, 0D, 86, 55, DE, F9, 06, 87, 29, 02, FA, 8D, 9D, 7A, 0C, 8A, A5, 84, D7, 20, 62, CD, 0C, 54,
BC, A8, 52, 62, 2D, 90, 2A, 1B, DA, 7E, 71, BB, 3C, 4F, 85, 26, 9C, 4E, 1C, 9A, CB, 69, 41, 89, EB, 79, D
D, 3F, 6E, 19, AA, 61, 90, 7F, 1C, 49, EE, 3C, EB, 7F, AE, 62, B8, 0E, FE, AA, 79, 4B, 0A, CE, 85, F8, 46
, 38, 37, AA, 51, EE, AA, 01, A9, DB, 71, 6F, A9, 74, AE, 0E, 93, 28, FA, 63, 6A, E3, 26, 7E, F4, B1, FF,
B2, C6, 06, 16, A3, E9, A5, EE, 37, 4A, B0, ED, DB, 4A, AA, F6, 43, 1D, 1E, 8B, 7D, 93, 9E, B5, 06, A5, 7
8, F2, AF, 6C, 5A, 8A, D1, D7, 46, 32, 34, E3, 9F, A3, 30, 0D, 1B, F0, C8, E4, E7, 72, CC, EE, DC, 68, C7
, 33, 8D, 8E, 5B, 03, 19, E9, 04, 0B, 58, 8A, B8, 28, 6F, 73, A6, 73, 70, 82, 8E, 2C, 4A, 78, 71, AA, F2,
6F, D8, 62, 78, EB, EB, 36, 9E, 36, B3, 24, 4B, 1A, 3E, 96, 36, 72, 56, 55, 93, 54, CA, E5, 5F, 86, FD, 8
B, 55, 76, CE, 09, 24, C6, D0, E2, 94, F9, 95, ED, D5, C4, C9, F7, 6D, 0E, E5, 97, 7B, 97, D4, 71, 6F, 08
, 7B, 2A, 18, 74, 61, 20, 25, 7B, 70, 61, E2, 77, 06, A5, F2, D6, D6, 2B, 6E, 7D, 85, 9C, 8A, 67, 73, CD,
02, FA, 5E, DB, 72, 7E, 70, C9, C7, 34, FA, DC, 96, 4A, 39, 1C, A2, 73, 67, F8, 5A, 43, 1B, 15, 57, 9B, 9
8, 87, 0D, 33, C2, 70, F4, B2, AC, 7E, CB, 75, 04, 8F, B9, 61, 9D, 3B, 14, 82, AC, F1, FD, F3, 2B, CC, DF
, A6, F9, 3B, D8, BE, A9, BA, 30, C4, D3, 16, 59, 4F, D2, 74, B0, 1C, 66, E2, 05, 89, 75, E6, 1F, 62, B7,
4D, C2, A5, 45, 01, 89, 8A, A0, 40, 2A, 99, 15, 27, 2E, 37, 90, CB, 89, 50, 4A, 89, BF, 0A, D2, AD, B0, 4
6, EC, F9, 7A, 55, 8E, BA, AE, 39, E0, 6E, 5A, FC, 84, 96, 6C, 8B, CB, 44, 26, 80, 1C, 83, 72, 85, D6, 9C
, 40, 08, DF, 78, 52, EC, 6C, 17, 18, 52, CD, 99, B5, 2C, 09, DE, D5, 74, 6F, CE, E4, 6F, C7, C6, 20, CB,

97,1F,25,30,5B,A5,5A,A8,C8,A2,4E,2B,B4,CB,77,CA,46,53,5F,FF,60,8B,D4,CF,33,4C,2
D,7D,23,67,88,35,B0,D6,45,51,2F,16,17,1C,D9,93,0F,FD,C4,9E,34,12,09,8E,35,70,2C
,5D,66,B8,E9,70,61,FD,28,D6,94,F8,CA,66,85,20,64,79,26,D1,07,AE,BE,AD,CE,9B,21,
1C,7A,5C,56,24,D7,94,46,F5,2D,18,01,E0,9D,25,02,FA,91,7F,55,92,38,F4,F8,60,4C,F
9,B2,B2,02,C5,7C,18,E6,D1,67,B5,94,D8,1D,1B,5F,9F,AD,C1,B3,EB,6C,08,6F,AE,08,2E
,59,31,BF,98,63,61,5F,A4,87,2D,02,8C,85,FB,AE,79,09,53,81,49,C3,58,DF,9B,74,DD,
2C,AB,90,76,2B,50,62,BD,33,5A,B6,94,25,53,5D,A4,90,BC,6B,29,FE,B4,28,A6,D0,A3,5
1,BF,E5,9D,A6,70,2F,B2,34,AA,B9,B9,C6,EE,5C,B0,EA,03,A2,02,6F,DB,30,9B,89,98,59
,12,C3,6B,0B,75,77,F2,4E,75,B1,2B,15,5B,C3,20,DD,B3,66,BB,2E,BA,9C,A9,FE,C5,51,
84,A1,67,AD,B3,B6,7F,78,26,87,85,16,B4,17,BB,2A,AD,F7,16,6D,34,60,3C,58,6B,BD,B
6,F2,32,2A,B4,2C,68,F1,FD,3B,8F,85,53,18,D6,2B,6D,57,89,71,32,1C,CE,84,1B,01,BB
,20,D9,78,80,55,A7,67,6B,7A,46,43,C7,AC,A1,FD,73,E1,89,B8,A2,8E,9E,A6,CC,97,4C,
27,23,24,08,88,22,C5,61,31,E5,5F,18,46,3C,27,5E,31,3E,CB,DB,32,6E,50,23,19,08,5
E,1B,95,AD,02,FA,EC,CF,19,F7,15,A3,14,BB,EE,15,93,4B,EB,3F,66,62,E3,E8,41,9C,12

###PAYLOAD_END

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###PLISTEN: Level: 3:

###STATUS: SL: 5, CYC: 1, RQ: 1, REV: 0, LSB: 0, dF: 16.6, CRC: D84D, FRCNT: 2,
FRNR: 87

###PAYLOAD1: LEN: 922, TYPE: 8

###PAYLOAD2:

E9,63,24,C3,3B,21,A1,7A,25,AF,C5,E2,96,4A,87,E9,B9,0B,78,6C,37,51,7E,A7,12,3F,1
1,DB,2C,8C,FB,49,26,C8,A9,B2,B9,8D,FD,30,A1,78,D3,65,14,09,7A,F6,05,92,0A,C5,D4
,5A,92,43,7C,19,5D,A0,F4,AB,D6,AB,60,51,90,72,D3,BE,5D,AC,E3,B7,78,71,6A,55,AA,
43,F3,30,BD,EE,61,95,41,E3,01,A8,DD,F4,C8,21,05,AA,68,D9,74,6E,4E,76,36,28,FC,B
4,A7,68,B9,B5,5D,AB,13,F3,50,0C,F8,E6,43,04,BC,47,B5,33,4B,93,67,E0,63,83,A1,7E
,1E,DB,A2,0D,86,55,DE,F9,06,87,29,02,FA,8D,9D,7A,0C,8A,A5,84,D7,20,62,CD,0C,54,
BC,A8,52,62,2D,90,2A,1B,DA,7E,71,BB,3C,4F,85,26,9C,4E,1C,9A,CB,69,41,89,EB,79,D
D,3F,6E,19,AA,61,90,7F,1C,49,EE,3C,EB,7F,AE,62,B8,0E,FE,AA,79,4B,0A,CE,85,F8,46
,38,37,AA,51,EE,AA,01,A9,DB,71,6F,A9,74,AE,0E,93,28,FA,63,6A,E3,26,7E,F4,B1,FF,
B2,C6,06,16,A3,E9,A5,EE,37,4A,B0,ED,DB,4A,AA,F6,43,1D,1E,8B,7D,93,9E,B5,06,A5,7
8,F2,AF,6C,5A,8A,D1,D7,46,32,34,E3,9F,A3,30,0D,1B,F0,C8,E4,E7,72,CC,EE,DC,68,C7
,33,8D,8E,5B,03,19,E9,04,0B,58,8A,B8,28,6F,73,A6,73,70,82,8E,2C,4A,78,71,AA,F2,
6F,D8,62,78,EB,EB,36,9E,36,B3,24,4B,1A,3E,96,36,72,56,55,93,54,CA,E5,5F,86,FD,8
B,55,76,CE,09,24,C6,D0,E2,94,F9,95,ED,D5,C4,C9,F7,6D,0E,E5,97,7B,97,D4,71,6F,08
,7B,2A,18,74,61,20,25,7B,70,61,E2,77,06,A5,F2,D6,D6,2B,6E,7D,85,9C,8A,67,73,CD,
02,FA,5E,DB,72,7E,70,C9,C7,34,FA,DC,96,4A,39,1C,A2,73,67,F8,5A,43,1B,15,57,9B,9
8,87,0D,33,C2,70,F4,B2,AC,7E,CB,75,04,8F,B9,61,9D,3B,14,82,AC,F1,FD,F3,2B,CC,DF
,A6,F9,3B,D8,BE,A9,BA,30,C4,D3,16,59,4F,D2,74,B0,1C,66,E2,05,89,75,E6,1F,62,B7,
4D,C2,A5,45,01,89,8A,A0,40,2A,99,15,27,2E,37,90,CB,89,50,4A,89,BF,0A,D2,AD,B0,4
6,EC,F9,7A,55,8E,BA,AE,39,E0,6E,5A,FC,84,96,6C,8B,CB,44,26,80,1C,83,72,85,D6,9C
,40,08,DF,78,52,EC,6C,17,18,52,CD,99,B5,2C,09,DE,D5,74,6F,CE,E4,6F,C7,C6,20,CB,
97,1F,25,30,5B,A5,5A,A8,C8,A2,4E,2B,B4,CB,77,CA,46,53,5F,FF,60,8B,D4,CF,33,4C,2
D,7D,23,67,88,35,B0,D6,45,51,2F,16,17,1C,D9,93,0F,FD,C4,9E,34,12,09,8E,35,70,2C
,5D,66,B8,E9,70,61,FD,28,D6,94,F8,CA,66,85,20,64,79,26,D1,07,AE,BE,AD,CE,9B,21,
1C,7A,5C,56,24,D7,94,46,F5,2D,18,01,E0,9D,25,02,FA,91,7F,55,92,38,F4,F8,60,4C,F
9,B2,B2,02,C5,7C,18,E6,D1,67,B5,94,D8,1D,1B,5F,9F,AD,C1,B3,EB,6C,08,6F,AE,08,2E
,59,31,BF,98,63,61,5F,A4,87,2D,02,8C,85,FB,AE,79,09,53,81,49,C3,58,DF,9B,74,DD,
2C,AB,90,76,2B,50,62,BD,33,5A,B6,94,25,53,5D,A4,90,BC,6B,29,FE,B4,28,A6,D0,A3,5
1,BF,E5,9D,A6,70,2F,B2,34,AA,B9,B9,C6,EE,5C,B0,EA,03,A2,02,6F,DB,30,9B,89,98,59
,12,C3,6B,0B,75,77,F2,4E,75,B1,2B,15,5B,C3,20,DD,B3,66,BB,2E,BA,9C,A9,FE,C5,51,
84,A1,67,AD,B3,B6,7F,78,26,87,85,16,B4,17,BB,2A,AD,F7,16,6D,34,60,3C,58,6B,BD,B
6,F2,32,2A,B4,2C,68,F1,FD,3B,8F,85,53,18,D6,2B,6D,57,89,71,32,1C,CE,84,1B,01,BB

, 20, D9, 78, 80, 55, A7, 67, 6B, 7A, 46, 43, C7, AC, A1, FD, 73, E1, 89, B8, A2, 8E, 9E, A6, CC, 97, 4C, 27, 23, 24, 08, 88, 22, C5, 61, 31, E5, 5F, 18, 46, 3C, 27, 5E, 31, 3E, CB, DB, 32, 6E, 50, 23, 19, 08, 5 E, 1B, 95, AD, 02, FA, EC, CF, 19, F7, 15, A3, 14, BB, EE, 15, 93, 4B, EB, 3F, 66, 62, E3, E8, 41, 9C, 12

###PAYLOAD_END

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###PLISTEN: Level: 3:

###STATUS: SL: 5, CYC: 1, RQ: 0, REV: 1, LSB: 0, dF: 16.5, CRC: B59A, FRCNT: 3, FRNR: 88

###PAYLOAD1: LEN: 920, TYPE: 8

###PAYLOAD2:

F3, B9, D1, E7, 0D, 54, C6, E5, 93, 79, 37, C4, BD, 1A, 57, 85, 6C, 67, FC, 77, 01, 59, 5E, B7, AA, D4, A 1, A9, AD, 0B, 34, 3F, 55, D2, 56, AC, 6B, 0E, 33, 13, 9D, 6A, B0, 2D, AC, D6, F3, 4E, 0A, EF, A7, 98, ED , C8, B4, 44, 6B, 5F, 22, A1, BA, 6A, 5F, 3A, F0, CB, 82, D4, CE, A9, B3, A6, 85, 2E, FD, 98, 29, FA, B2, BE, 3F, 05, A2, 12, 4F, 26, D3, 56, 6D, D9, 5C, D8, 7B, C8, CE, 1A, 88, A3, 00, BF, DA, 97, 17, 65, DF, 1 0, 7B, EC, 7E, 5E, 48, 3C, B6, 3F, D7, 62, C8, 6B, 93, 98, 4F, 44, 32, 4F, 87, 37, 9F, F1, 33, 47, B2, E4 , 49, 7F, 08, 6E, C8, 0A, FB, 7F, DC, 92, 8D, A1, C5, AC, B7, C1, 89, E9, 19, 62, DD, C3, B5, 9C, 50, 31, 8A, 22, A9, A9, 57, AB, A1, 3C, 9A, 6A, 17, 5D, AE, B2, D3, 8F, C5, A6, 31, 28, 9D, 7E, 77, 16, 79, 65, 0 0, 59, AE, 40, BE, 7F, 38, 5E, 66, AD, CB, 17, FA, 48, 66, AA, C6, 07, 77, 1F, FA, 57, 35, DD, 64, 8B, 1E , 19, A4, 8A, DD, 5F, 06, 94, 16, C8, 49, 05, 93, F7, ED, 50, E6, 1B, 4D, 02, FA, 8F, CB, 31, 5D, 93, 91, 5B, 31, B2, 9D, 6F, B8, 99, 59, 75, 32, CB, 50, AE, 68, 8A, 81, 3D, DA, 9F, 87, 73, DC, 86, 29, D3, 2B, 4 2, E0, B9, 86, AC, 73, B7, FE, 6B, 1F, 37, F4, 04, CC, 6C, 55, 2F, 38, F2, E4, B1, A0, 96, 9B, A2, 49, FB , 0A, 13, 55, B8, AB, BC, 3E, B0, 63, 54, EC, DB, 77, 49, 17, 15, EF, 10, 37, 46, EE, 9A, 63, 4F, D7, 09, 48, 2F, 61, 79, C5, 84, D6, E5, E2, 9F, 76, D2, 7E, 29, C5, E4, B6, 2B, D6, 4A, 91, 98, 67, 21, A2, 46, C 2, 82, B1, 9F, C2, 39, AC, 8A, 0A, AB, 97, 23, B4, DA, 50, 6B, D5, C9, 3C, 2A, 1D, 9E, 87, 37, 68, F7, FC , AB, E0, 98, E8, B5, D9, 7D, 71, 90, B3, 1B, A5, F7, 17, A9, D1, 51, 8D, FE, 55, DC, 0E, CF, E2, 99, AE, 20, 09, C4, EF, 32, 2D, E1, 79, E1, B2, BB, 28, EE, A1, BB, C1, 5C, 0A, E1, 61, 98, 8F, 05, A1, DE, DC, 8 5, B5, 4B, 45, 59, 73, 98, D4, 6F, 82, E0, 3F, CB, 3B, 80, 2E, B9, 0F, 1F, EC, E0, 0B, 29, B1, 7E, 33, 08 , B5, B3, EB, D4, 38, 0E, 15, B8, 5C, DB, 14, 38, C1, A9, 78, 23, 82, 45, 6D, 05, 92, AA, 95, 52, 98, 6E, 75, 88, 5D, 99, 15, 9D, E0, 02, FA, A5, 47, 22, 37, 1B, BF, 35, FE, FA, 28, 21, 97, 35, 9D, A7, D4, D4, 6 0, 10, 32, DF, E4, AC, 63, 64, DD, 51, E6, 41, EC, 42, CD, 1B, 7D, F1, 5E, 7D, 21, CB, 91, C2, 50, 6C, 13 , 82, B5, 51, 61, BD, DA, BD, 58, D9, 3A, 0E, 9D, B1, E6, 0E, 37, 8A, A3, 09, F4, BD, AE, 34, 1C, 36, 5B, E7, A7, 6D, 0A, 7B, 02, AD, CD, C2, EB, CE, 19, 89, 69, C4, 24, A8, 31, 9A, 0F, 7E, 53, 98, 16, B4, 56, 2 1, B9, C5, 02, 05, 18, 29, 2A, B6, 9D, EA, D8, DC, 63, 6B, 89, EE, 6B, BC, 80, E8, E7, C2, F3, 58, 5A, DB , 69, E9, BD, B1, 64, 00, EF, 58, F0, 0F, 00, 1A, E8, 68, 42, E5, 64, DC, 7A, F6, 3B, DF, 41, 86, 0A, C0, A0, 79, 6C, FC, 30, FC, A7, A0, 8D, 56, CD, C2, 6D, D8, 66, 33, 73, 72, 65, 1F, 6F, DC, CA, 6B, 90, 9F, 1 9, A2, 0C, 8B, 34, 62, 71, DA, 85, BC, 63, 21, FB, 9E, A1, 6D, 0F, 72, B1, 3A, CC, DA, EF, 25, 34, F8, 60 , FF, FE, 77, 4C, 91, 59, C3, 34, 9C, 62, F6, EA, FD, 95, 31, 8B, 11, E2, 45, 86, C0, 78, D1, B8, 30, F0, B5, F7, 09, CE, 11, 1A, 73, 48, 08, 54, 3A, D6, D7, 3D, 4D, A6, 85, D2, 0B, 2E, 6F, 29, 02, FA, BE, FC, 2 8, 14, DC, 2B, 08, E8, 06, 5C, 59, 17, 0D, 6A, BE, 1B, D5, CE, 3A, F2, F7, 01, 74, 51, 9A, 69, 58, 09, 6B , E6, 90, 74, 5F, 5C, 98, AC, A2, AA, 34, DA, 65, 3C, 39, 5D, C2, 55, 0D, 02, 5B, D5, 25, FE, D6, 63, 41, A1, D9, 94, 16, 7C, 8C, 5C, 70, 2C, 5D, 2B, 78, 37, 1B, 9A, 6B, 36, 29, 74, AC, 48, 72, 5F, FB, E6, DB, C D, A5, C7, 8D, A3, 43, A2, 9D, C7, 73, 83, 86, 4D, 5B, 5A, 2E, 6F, FB, 47, 49, B6, CA, 3B, 32, 73, B7, C3 , F3, BC, 4D, 66, C1, DA, E5, 6F, 56, ED, A6, D4, BF, 33, 86, 5F, FE, F9, C3, 61, CA, 99, 2E, 5A, AE, 94, 2A, 65, C5, DC, DC, 99, 97, 57, 8E, 13, 1C, 1D, 7E, C0, BF, 79, 41, DA, E9, 39, 51, 90, 3E, 87, 37, 3E, 5 C, 9D, E9, C5, BC, 92, BC, B4, D0, C0, 98, 88, 97, 9C, FD, C1, BA, B3, F2, 66, 18, 85, B7, 76, DE

###PAYLOAD_END

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###PLISTEN: Level: 3:

###STATUS: SL: 5, CYC: 1, RQ: 1, REV: 0, LSB: 0, dF: 16.3, CRC: B59A, FRCNT: 3, FRNR: 89

###PAYLOAD1: LEN: 920, TYPE: 8

###PAYLOAD2:

F3,B9,D1,E7,0D,54,C6,E5,93,79,37,C4,BD,1A,57,85,6C,67,FC,77,01,59,5E,B7,AA,D4,A
1,A9,AD,0B,34,3F,55,D2,56,AC,6B,0E,33,13,9D,6A,B0,2D,AC,D6,F3,4E,0A,EF,A7,98,ED
,C8,B4,44,6B,5F,22,A1,BA,6A,5F,3A,F0,CB,82,D4,CE,A9,B3,A6,85,2E,FD,98,29,FA,B2,
BE,3F,05,A2,12,4F,26,D3,56,6D,D9,5C,D8,7B,C8,CE,1A,88,A3,00,BF,DA,97,17,65,DF,1
0,7B,EC,7E,5E,48,3C,B6,3F,D7,62,C8,6B,93,98,4F,44,32,4F,87,37,9F,F1,33,47,B2,E4
,49,7F,08,6E,C8,0A,FB,7F,DC,92,8D,A1,C5,AC,B7,C1,89,E9,19,62,DD,C3,B5,9C,50,31,
8A,22,A9,A9,57,AB,A1,3C,9A,6A,17,5D,AE,B2,D3,8F,C5,A6,31,28,9D,7E,77,16,79,65,0
0,59,AE,40,BE,7F,38,5E,66,AD,CB,17,FA,48,66,AA,C6,07,77,1F,FA,57,35,DD,64,8B,1E
,19,A4,8A,DD,5F,06,94,16,C8,49,05,93,F7,ED,50,E6,1B,4D,02,FA,8F,CB,31,5D,93,91,
5B,31,B2,9D,6F,B8,99,59,75,32,CB,50,AE,68,8A,81,3D,DA,9F,87,73,DC,86,29,D3,2B,4
2,E0,B9,86,AC,73,B7,FE,6B,1F,37,F4,04,CC,6C,55,2F,38,F2,E4,B1,A0,96,9B,A2,49,FB
,0A,13,55,B8,AB,BC,3E,B0,63,54,EC,DB,77,49,17,15,EF,10,37,46,EE,9A,63,4F,D7,09,
48,2F,61,79,C5,84,D6,E5,E2,9F,76,D2,7E,29,C5,E4,B6,2B,D6,4A,91,98,67,21,A2,46,C
2,82,B1,9F,C2,39,AC,8A,0A,AB,97,23,B4,DA,50,6B,D5,C9,3C,2A,1D,9E,87,37,68,F7,FC
,AB,E0,98,E8,B5,D9,7D,71,90,B3,1B,A5,F7,17,A9,D1,51,8D,FE,55,DC,0E,CF,E2,99,AE,
20,09,C4,EF,32,2D,E1,79,E1,B2,BB,28,EE,A1,BB,C1,5C,0A,E1,61,98,8F,05,A1,DE,DC,8
5,B5,4B,45,59,73,98,D4,6F,82,E0,3F,CB,3B,80,2E,B9,0F,1F,EC,E0,0B,29,B1,7E,33,08
,B5,B3,EB,D4,38,0E,15,B8,5C,DB,14,38,C1,A9,78,23,82,45,6D,05,92,AA,95,52,98,6E,
75,88,5D,99,15,9D,E0,02,FA,A5,47,22,37,1B,BF,35,FE,FA,28,21,97,35,9D,A7,D4,D4,6
0,10,32,DF,E4,AC,63,64,DD,51,E6,41,EC,42,CD,1B,7D,F1,5E,7D,21,CB,91,C2,50,6C,13
,82,B5,51,61,BD,DA,BD,58,D9,3A,0E,9D,B1,E6,0E,37,8A,A3,09,F4,BD,AE,34,1C,36,5B,
E7,A7,6D,0A,7B,02,AD,CD,C2,EB,CE,19,89,69,C4,24,A8,31,9A,0F,7E,53,98,16,B4,56,2
1,B9,C5,02,05,18,29,2A,B6,9D,EA,D8,DC,63,6B,89,EE,6B,BC,80,E8,E7,C2,F3,58,5A,DB
,69,E9,BD,B1,64,00,EF,58,F0,0F,00,1A,E8,68,42,E5,64,DC,7A,F6,3B,DF,41,86,0A,C0,
A0,79,6C,FC,30,FC,A7,A0,8D,56,CD,C2,6D,D8,66,33,73,72,65,1F,6F,DC,CA,6B,90,9F,1
9,A2,0C,8B,34,62,71,DA,85,BC,63,21,FB,9E,A1,6D,0F,72,B1,3A,CC,DA,EF,25,34,F8,60
,FF,FE,77,4C,91,59,C3,34,9C,62,F6,EA,FD,95,31,8B,11,E2,45,86,C0,78,D1,B8,30,F0,
B5,F7,09,CE,11,1A,73,48,08,54,3A,D6,D7,3D,4D,A6,85,D2,0B,2E,6F,29,02,FA,BE,FC,2
8,14,DC,2B,08,E8,06,5C,59,17,0D,6A,BE,1B,D5,CE,3A,F2,F7,01,74,51,9A,69,58,09,6B
,E6,90,74,5F,5C,98,AC,A2,AA,34,DA,65,3C,39,5D,C2,55,0D,02,5B,D5,25,FE,D6,63,41,
A1,D9,94,16,7C,8C,5C,70,2C,5D,2B,78,37,1B,9A,6B,36,29,74,AC,48,72,5F,FB,E6,DB,C
D,A5,C7,8D,A3,43,A2,9D,C7,73,83,86,4D,5B,5A,2E,6F,FB,47,49,B6,CA,3B,32,73,B7,C3
,F3,BC,4D,66,C1,DA,E5,6F,56,ED,A6,D4,BF,33,86,5F,FE,F9,C3,61,CA,99,2E,5A,AE,94,
2A,65,C5,DC,DC,99,97,57,8E,13,1C,1D,7E,C0,BF,79,41,DA,E9,39,51,90,3E,87,37,3E,5
C,9D,E9,C5,BC,92,BC,B4,D0,C0,98,88,97,9C,FD,C1,BA,B3,F2,66,18,85,B7,76,DE

###PAYLOAD_END

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###PLISTEN: Level: 3:

###STATUS: SL: 5, CYC: 1, RQ: 0, REV: 1, LSB: 0, dF: 16.7, CRC: EFE3, FRCNT: 0,
FRNR: 90

###PAYLOAD1: LEN: 916, TYPE: 8

###PAYLOAD2:

D0,AF,54,65,E8,C9,B9,99,AF,DC,12,99,97,4E,42,AB,B1,CA,AC,E1,1A,89,CB,B4,B0,67,C
F,35,78,6E,2C,CF,A2,C7,09,8E,B9,EF,2C,8D,5C,A6,C2,26,DB,85,44,24,05,73,66,96,31
,B5,5D,43,B6,6B,97,32,58,5D,38,C7,18,02,FA,36,F2,0B,D1,72,2E,2E,A9,5E,CB,E3,45,
28,FB,FE,EE,58,19,D7,32,9E,6D,3F,45,E0,65,C3,39,72,5E,0D,C2,3A,A4,06,F1,8D,90,9
C,87,9B,19,8E,45,8E,E4,BA,A4,AA,CC,2B,BC,BE,E8,1D,E8,75,C8,5B,5B,6F,DC,C1,F7,2C
,98,71,F0,6F,7C,18,69,18,C7,A4,97,BA,26,EE,DE,6F,CF,CB,46,A5,8E,1E,0B,0A,32,5D,
D9,BA,4D,79,96,71,C7,B9,DD,30,1B,05,56,57,FE,C5,51,89,AE,0F,E6,C6,EE,59,3F,BF,9
C,9C,35,41,74,BA,AB,8B,C7,B2,B7,EE,32,E1,CC,EF,C7,68,88,AB,36,C3,7F,3B,78,5A,C3
,F6,6C,E9,72,BF,CC,AA,78,D6,04,F3,51,0E,1B,06,4F,19,71,CD,95,CD,56,FB,A2,6B,FE,
6F,F3,CD,BE,66,6D,8E,B8,39,18,A1,A6,96,3A,9A,11,DF,00,32,EE,65,E8,E4,35,4B,62,F
8,F9,B1,90,18,6C,C7,F2,1D,C7,5C,63,F3,7C,F9,B0,D6,12,9A,9C,E5,7C,B6,DC,CD,23,E7

, 08, FF, 0A, 3B, E1, B3, 6A, 8D, 32, 1C, 53, FF, 72, F1, A6, 19, 86, 30, C4, A4, 61, F5, A8, 6A, CF, D2, E5, 02, FA, AE, D4, 66, 91, AC, 1F, 67, 22, 92, 73, C0, 2F, AC, 0A, D7, 07, F3, 49, 47, 11, 66, 0F, A0, 4 7, 1C, 1C, 6A, 69, 49, 97, 1F, CC, B7, 67, 18, 4C, DB, 1A, 7E, 3A, AC, 2B, 0C, 98, 38, 86, C5, 4D, B7, A8 , 7B, 7B, 0C, 3C, E2, 4D, A9, C6, 14, 5C, 2D, FD, DE, 07, 21, 92, 0E, C0, 59, AA, B7, A7, 30, 00, B9, 48, 42, D1, AD, 0B, A2, AB, A8, 27, 20, 24, D8, CD, F3, FC, A4, C7, 76, 39, 73, 19, B7, 53, 44, 7E, 34, 74, E A, 23, 44, C9, E4, CA, 25, A1, C6, 44, 4B, 05, CD, EE, B7, 77, 32, 50, D9, 00, F3, 1F, A8, E0, 23, EB, FA , 15, DC, 04, 10, 14, 71, CB, 60, C5, 2E, 92, D9, 31, E5, 67, 79, BC, 03, 0D, DC, 20, B5, 35, 3E, 2A, 76, A4, F1, 5B, 0D, 28, 9B, 71, 67, 3E, D7, 07, B1, 21, 3E, B6, 6F, 8B, AD, 9D, 74, 4C, 0E, 7C, BF, 7E, 8C, 6 B, 58, 2A, 5E, CE, 6A, 8A, E8, F3, F8, CD, 1D, A8, AF, E8, F6, 1A, DA, 94, AD, EA, D2, AC, F9, BC, 70, 48 , D7, 2C, E5, 33, 70, D3, 8A, 88, 67, 32, 30, C5, 26, D5, 1B, BB, 2E, 08, DE, B5, A1, 6B, 55, 50, 2E, 5B, 5C, DD, A6, 98, D9, 8B, 47, 02, CD, B7, C9, B0, 70, 2D, 91, 06, 02, FA, F3, 00, 79, 2D, 52, 51, 98, 81, 4 E, 54, EE, 5B, FD, 1B, C1, CC, F3, 29, 07, 1C, 6A, BC, DC, C6, B4, E7, 96, 47, 77, 8B, 1F, EE, 66, F6, E6 , 5E, DB, A2, D9, 62, 48, 57, 41, B7, 45, BD, C7, 7B, C6, 54, A9, 45, 68, 39, 40, 66, 29, B2, 85, 68, C5, 11, 30, FC, 93, E6, 4B, 65, 6B, 19, C0, 14, CA, F6, AC, A4, F1, 44, 49, C5, E3, 77, EA, 08, AC, 74, AE, E 9, A2, 75, B6, 6F, F5, 9C, E6, D1, 2E, AD, 15, 11, CD, AB, 28, F6, ED, 80, DD, 0F, 03, 29, 4C, 56, 79, 1A , 6A, B8, 16, 49, F2, FB, E3, 2A, 55, 25, 47, E5, 36, C9, 46, C7, 2B, 22, BC, 50, D3, BF, C7, 20, 05, 6A, 7D, 33, 1C, D5, B3, AA, 6E, 9B, 4D, 2D, 26, 69, BF, 6C, 1D, B8, 40, 4A, 8D, 8D, 45, 23, E6, 92, 17, 67, 4 E, AD, B7, C1, C0, 16, 7C, E3, DF, D6, 5F, 7D, 69, 49, B3, E9, 52, 08, 16, 85, 61, CB, 8B, 82, 90, 71, C8 , 19, 9B, 3E, 33, C7, D4, 59, 54, CD, 81, BA, C1, 35, EC, 76, 59, 14, BF, 89, 1A, 5B, DA, 84, 43, 7D, 13, 1D, 59, 2E, BA, E3, 9F, BC, 17, A0, 8E, AD, 51, 34, B2, 1A, D7, 21, 70, 21, 99, AA, 41, 97, 1D, 4E, 12, 4 5, 1D, CA, 43, 09, 02, FA, 94, 33, 4D, D9, 48, AA, 1C, 4E, A5, 39, 67, EB, 91, 1F, 18, A7, 74, 37, 35, 6B , DF, 26, CF, 3F, 25, B5, CB, 6A, D1, 7F, C9, DC, C9, ED, 09, 29, 86, AA, 56, 84, 8E, CC, ED, 4F, 22, C6, B4, 90, 7C, 11, CB, AD, D5, 50, 38, F4, 54, AE, D3, 15, 12, 88, 5A, 89, A8, 98, 66, 0D, 59, 72, 10, 21, 2 5, 25, 33, 32, 57, 58, 96, C9, 16, E7, 54, 3B, F9, AB, 9A, 59, 22, D4, D8, 5D, 6C

###PAYLOAD_END

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###PLISTEN: Level: 3:

###STATUS: SL: 5, CYC: 1, RQ: 0, REV: 0, LSB: 0, dF: 16.9, CRC: F9A5, FRCNT: 1, FRNR: 91

###PAYLOAD1: LEN: 916, TYPE: 8

###PAYLOAD2:

EA, A6, AC, 78, EA, 69, DA, 3A, 13, D6, AA, E3, 1F, CF, 97, 3A, 71, B1, C9, D3, 89, E0, BF, 62, 2B, EB, F 6, 1F, 64, 67, BC, 66, 8D, 61, 2D, 2B, CA, F3, 58, 8B, BD, 6E, 57, B6, 09, 4C, 68, 94, D6, A3, DC, 01, B2 , DF, CB, 90, DC, CC, D7, 7D, DA, DA, 2B, 69, 26, 4F, E9, 78, D8, DD, DA, DF, 94, AD, E5, 0D, 42, 76, C5, E1, 0C, 5F, 71, 30, EE, CD, 4C, B2, B3, 72, 79, 90, CC, 91, 2D, 4B, 8E, B3, 01, DF, 22, BE, B1, 32, FA, 2 4, 9A, AA, 33, 38, 79, 5D, 30, 33, E7, A8, F3, 2D, 1B, F2, C3, 7E, 91, 79, 53, D2, 9A, E0, 6F, 45, 36, 37 , BB, 7C, 5A, 53, 79, 30, F8, 56, 44, 25, A2, 64, 76, DD, CB, D2, 96, DA, 75, F0, F1, B1, 90, 38, FD, 02, FA, E8, 6B, A3, 4F, 96, 8B, 4E, A5, DC, 11, 8A, 32, D9, 70, 79, 28, A6, 79, 0E, F8, FE, E7, D5, 79, 59, 2 9, 45, E1, 0E, 1B, 9F, 26, 97, 25, 7A, 3A, 20, 7B, 7A, 77, 98, 56, 3F, B4, E5, B5, E3, EC, 93, F9, 45, D5 , 8A, 05, A5, 18, 1D, 8A, F9, 77, EC, 3E, C7, 3B, 21, B2, 36, 5D, 6F, A8, 87, 0E, F0, F2, CD, C1, BD, 54, ED, 9A, AB, CD, B3, 0D, DC, D1, 45, DD, 2C, 1C, 5C, AC, 5F, 54, 6F, F6, B6, B5, 30, EC, E1, 26, 64, 20, 5 8, 73, C2, 33, 43, 72, 69, 3C, 37, ED, B6, EE, 2E, 6C, 70, 35, 84, 4B, 29, AA, 9D, BD, 25, 28, 2E, 9B, C8 , 63, AA, 81, EC, C5, 9B, 27, 0E, 3D, 4C, 8E, 3F, C7, D9, 40, 03, 3B, D1, FB, E9, 9E, 98, D8, 4F, F6, 64, 19, DD, 5A, FC, BD, 19, 66, 87, B1, F7, E6, 91, C6, 39, B3, 4A, E4, 79, BC, 08, FC, 62, C6, 52, 67, 1F, E E, 6D, AB, 38, B5, 52, BA, 3A, 17, 60, 1E, 05, 43, DB, 83, 5E, A0, FD, 6F, 20, 18, FC, 0F, A8, 36, D0, 06 , 94, 44, C3, DF, 0B, 3C, A6, 44, 9A, 3C, BF, F1, 7B, F4, B5, 02, C5, 26, A2, CC, 2D, BE, EB, 1B, 98, 33, 8D, D6, F2, 71, 21, 4F, 0C, 01, 54, 2D, E3, 7E, EC, A0, 02, FA, 89, 8B, E5, 5C, B3, 18, FE, 9C, 07, 5D, C 2, 56, 44, AD, 0F, 66, AB, A5, D3, 1D, 8E, 0D, 86, D8, 67, 9D, 7F, 5B, C0, CC, 6E, 3B, CC, 5E, D9, E2, 62 , B7, 67, 15, 80, EA, F4, 6E, 35, 91, 5D, 2A, 61, 08, 67, 9A, BC, 93, 2E, 71, C1, C7, 67, 32, B7, 72, E4, EF, 4E, B5, 5D, 4A, E8, 96, 89, 8F, 1C, 33, 48, 13, 69, D6, 17, 87, 33, 0A, E5, A9, 4C, 8B, 73, 1B, 2F, 1 2, 4A, 0F, 83, DE, 02, 3A, 96, D4, 8D, BB, F9, 95, 29, DB, 57, 1F, E6, 3E, 35, 77, E6, C1, 3B, FA, 32, AE , E9, 2B, 3C, EB, 58, 2C, A4, 10, 48, 93, 14, 01, 17, 1A, 32, B4, D5, B6, 3C, AE, 14, 86, 2C, D6, A1, 6D, 57, C2, B8, C3, A4, 0B, E6, CD, 5C, C6, 15, B5, A2, 8D, 03, 78, 90, 11, 76, FB, F2, 9C, 18, EA, C8, F6, 8

C, 45, EF, 0F, 90, A1, 3B, 6F, 35, CA, FE, 66, 72, 16, 65, 30, 94, 49, 8F, 2E, 7E, D0, 7E, 96, AC, 95, CE, 36, AC, 7C, C4, 58, F9, 1F, A5, 2A, 05, 43, 2A, ED, 99, A0, 21, 8A, 57, 86, B8, 5C, 04, 76, 90, D8, 0C, 5B, 4C, 1F, 50, 60, 01, 66, 99, 5C, 7B, B3, F4, 40, D3, AD, A4, D1, 55, 19, B3, 59, B0, C3, 6C, C3, 45, F C, 5A, ED, 02, FA, BE, 0A, 55, 35, 46, E2, E8, B8, E2, B8, AA, A9, 5C, E5, 3E, E9, 4D, 92, 8A, 8F, B3, A8, 2C, 9C, F5, CC, 8A, 5D, A9, CF, A6, EA, A1, F6, DC, C5, 16, 60, C3, C7, D7, 09, A2, 5B, 2D, 43, 29, C9, B8, EB, D3, 24, 0C, A5, 96, 95, D2, D8, 0E, 1F, 55, 1B, FF, DB, 0F, 02, 52, A3, DF, 51, AC, 1C, DB, 38, B C, B7, AD, 28, 2F, FA, 98, 6D, 72, 1B, B3, 5D, 25, 96, 15, D7, 52, E0, B6, DD, 11, 2B, A2, F0, B3, 18, 64, 34, A3, 82, 4A, B9, 89, B9, 66, D7, 37, 81, 72, D7, 16, DB, 0F, 8B, 30, 8C, 8E, 6A, 7F, 71, E2, CF, AE, 1B, AD, D4, 5A, C0, 8A, 26, 6D, 07, F0, EB, 39, 2B, 0E, 45, 54, 8D, A3, FB, 93, FF, 58, E0, 56, 46, 6D, D 2, 45, 24, 29, EA, 48, 9E, 4B, 56, 9D, 5C, C2, C8, DA, 7F, E6, D6, 6A, F0, A1, 5E, 78, 27, 4C, A8, 26, 44, 30, CA, 19, 1C, 83, DC, 5F, 70, 2D, 2A, 9A, 3E, 79, 71, FA, 1B, C0, E2, F3, 0E, 29, 59, 1C, FC, 3B, 87, 92, B5, 76, 42, 38, 75, DA, F6, EF, 54, D3, 94, D5, 69, E5, 78, 09, BC, 26, BC, D4, 23, 76, 20, 7F, 5C, C C, 51, 33, A6, 9F, 2C, DD, F5, 24, 5E, F2, CD, 86, 3C, A9, FA, 69, DB, 02, FA, D7

###PAYLOAD_END

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###PLISTEN: Level: 3:

###STATUS: SL: 5, CYC: 1, RQ: 0, REV: 0, LSB: 0, dF: 16.7, CRC: D7D8, FRCNT: 3, FRNR: 92

###PAYLOAD1: LEN: 919, TYPE: 8

###PAYLOAD2:

9C, 48, E2, 4C, 25, AA, 91, FF, C6, 6C, FA, 22, 68, BF, D6, 64, 73, E5, 3B, F1, 26, 8E, E3, 80, 70, A8, 3 9, 1B, BB, 40, 13, 28, CA, 1E, B2, 47, 0F, 14, 1B, 13, E9, 09, FF, 23, 78, B5, B4, 3C, FF, 24, A7, FC, D2, C0, 21, BC, 89, 09, 9C, 76, CC, 95, 20, 5D, C4, 8B, AD, C0, F7, 02, 4C, 83, A7, B2, B7, D4, 85, CC, F7, 58, 6C, 73, 1F, 02, FA, 7B, 7E, FA, EA, AE, 67, 02, E9, FD, B1, 80, 5C, AF, 7D, 4B, 1B, 4B, 2D, 2C, 16, 8 7, 3F, C4, 7F, 01, C1, 7F, 64, CB, 58, B1, B0, D6, BD, 66, 29, 44, 2A, F3, 67, 31, D3, 25, 96, 24, E1, C6, 25, E5, DE, 56, C0, 6E, 26, EE, 55, 80, 1C, 7F, 5A, E9, EC, 31, 92, 79, FF, 2E, 28, 16, D6, E3, BB, C9, 3F, 66, 61, 59, 79, 56, B2, 23, EF, 65, 02, 2B, DD, CE, 25, 6D, DA, F0, 60, C9, C8, A5, 36, F1, BC, B5, D B, C2, 1F, D4, 4A, DB, 67, F4, 74, 90, 8F, 65, BF, E0, 6E, 2E, DE, 2D, 77, 4C, 0D, B7, 2B, 6D, 05, A3, 20, CA, F0, 93, 37, DC, 23, A7, C8, F5, 7E, DA, 07, 6F, 5F, B6, 45, 22, CF, C6, C6, 3D, 7A, 2E, 6F, E4, 83, 56, F3, 7E, 13, FF, CC, 73, 2C, 4A, 8B, 34, 90, 4F, 37, 5F, 56, 7D, 16, E5, 25, AA, 3D, 43, 9B, BC, 26, 6 6, 0D, 75, 5B, 8E, 9C, CC, 58, 22, 67, 29, 27, 39, 13, 99, 52, EC, 09, 68, 04, CA, 28, C5, B4, E0, EA, E6, 5F, 08, 2B, B8, 6B, 8C, 90, 51, 56, 32, 3A, 4F, D6, F3, E3, AE, B6, 9D, 6C, EA, F2, 20, DF, 4F, 3A, 35, EF, FD, 0E, 71, 06, AF, 43, 76, 76, 92, A0, 2C, F9, 6E, 1A, E7, F9, AD, 49, 02, FA, 31, 8B, 3C, E3, 8F, B B, 1F, 61, CE, 63, 23, 29, 37, A7, 16, 4D, 1B, 60, F5, BD, DE, 03, A3, 6C, 3C, C3, 4D, 09, DF, 62, 98, 24, 59, 2B, 5A, 8B, DC, 5B, EF, B1, 2E, 77, C3, 61, 67, BF, D0, E3, 36, CB, D5, 1B, 47, 2C, 8C, 72, E1, 63, 57, 37, F7, 23, AB, F8, C9, 3A, F4, A0, FA, E3, E2, A7, 93, BF, 87, 37, 8B, B1, 6D, 33, A0, 32, 21, 6A, F E, 61, 2C, 82, 57, B4, CD, 2F, A9, 4C, AE, 81, EC, C1, 4C, AA, 2B, 88, 9C, FB, 6F, 71, 2D, FC, 57, 41, 44, B0, 0E, 99, 97, BA, FF, EB, 8E, 86, 3B, 2C, 50, DC, E8, 55, 8D, C3, 11, 64, 3A, 10, 9C, 7B, 3A, 88, 06, 91, EE, DC, 13, 39, C9, 53, 98, F0, E3, 62, CC, 44, 48, 76, FB, 65, E5, EB, DA, FC, 80, C5, EB, 95, E2, 7 4, B7, A6, AA, D6, D8, 4D, F9, 5E, 07, 4C, 06, 85, DC, B0, DC, 1F, 14, 73, 5B, 62, E0, 76, 2A, 8F, 66, 8F, CF, D1, 13, F6, AD, 68, D4, AD, 60, 6C, 25, 44, D1, 55, C2, EB, FF, F3, 38, 40, 67, DE, F0, 24, D8, AB, 1F, A5, 16, 37, 68, D0, 7B, 2C, 71, CF, 1D, D7, B3, 17, 46, E5, 99, C9, 2B, 04, 2F, D8, C1, 96, C6, D4, 9 B, 1C, C2, DE, 1C, A6, CC, 29, 02, FA, 9B, 3F, 60, 21, A4, EC, 00, 74, 91, 0D, 38, D0, 7C, C7, FF, B2, E2, CC, 68, 57, 85, AC, 19, 25, 47, 1B, 4F, 40, BC, 77, 96, 48, 4A, 08, 28, 7A, FD, 6C, 71, 27, 16, EA, FA, 9F, 8D, 30, 53, 1A, 67, 94, 0F, 5D, C5, B1, 78, 37, 36, 9B, 14, EB, C0, FB, 2D, 95, 7C, 53, 62, 74, 29, 3 0, F0, 9D, FF, 49, 9A, CA, 35, 03, 5A, E3, A2, FE, 57, 77, A1, 3F, 66, 66, 50, 2C, 72, 51, 9C, C3, EF, 0B, E2, E1, 46, 7F, D8, 18, D8, 6E, E4, 38, EA, 4A, 04, B9, 1F, 01, 9B, 80, BA, A6, EC, 5D, 00, 0E, 00, 32, 39, 9C, 8B, 5B, F0, 95, 28, D8, EA, A0, 1A, F8, C1, BF, 49, 02, FF, B7, 57, 8D, 1F, 33, 80, 07, A2, FC, F 9, FD, 30, 9F, EE, 59, DA, 05, A2, A6, AD, 2B, 3B, 7A, 1E, 7C, B7, B0, 42, E2, B7, 39, 95, 19, E5, F0, 31, DC, 02, 4F, A6, 29, 15, A9, C3, 0F, 79, E0, 42, 50, 0F, 5E, 35, 0B, 23, 10, 7D, 36, B3, 07, 9C, 55, 73, 9D, 99, 7A, AF, F3, 74, FC, 79, AA, 29, EC, E1, 54, E3, 7C, C6, 60, B5, 5C, EE, 39, 7B, AC, BE, 38, 70, 2 1, 6B, 3A, B9, 3A, 6A, AE, 2D, 39, 4C, EB, A3, FE, 2C, 6A, 52, 5B, 1C, 60, 77, 40, BC, A1, 02, FA, 1F, F3, 07, 8C, 38, 99, 2C, 32, E1, 56, 9B, EE, B8, 48, 19, 4F, 6E, 90, 63, E8, 8B, 7C, 63, 18, 2D, 6C, 06, 80,

DD,02,3B,6B,34,EA,7A,E1,36,3A,86,EE,0F,65,CA,43,1D,8C,CC,BB,6F,6D,D4,88,9C,5A,53,70,D2,2E,F1,EA,9D,4E,D1,AC,84,7A,42,59,71,A0,9A,A2,3D,96,B5,C4,B8,E9

###PAYLOAD_END

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###PLISTEN: Level: 3:

###STATUS: SL: 5, CYC: 1, RQ: 0, REV: 1, LSB: 0, dF: 16.4, CRC: 6B99, FRCNT: 0, FRNR: 93

###PAYLOAD1: LEN: 925, TYPE: 8

###PAYLOAD2:

2E,8D,F7,5D,B1,32,92,3E,E8,08,30,3B,A3,BB,DB,F4,6D,4E,43,BF,DC,EA,5C,26,FF,41,C4,71,0B,C1,27,A9,E6,87,D7,D7,9D,D9,3F,5A,F4,94,69,04,BE,03,79,AC,59,45,0D,23,B0,18,74,2C,EF,2C,94,D5,45,0C,52,A0,66,F4,EA,AD,F3,28,89,58,72,B9,C3,1E,58,65,07,A3,CA,6A,40,EA,AA,E3,66,0B,AB,0C,EB,D9,17,6F,E6,D8,E2,DA,04,55,B1,B3,79,5A,C5,37,05,1C,02,51,04,0A,D9,2A,B7,A8,3C,FD,12,2B,96,25,95,B5,76,0C,A9,31,55,47,2F,37,82,9C,7D,64,6F,F5,72,E3,FC,BD,C1,58,C7,8F,F7,36,A9,40,CA,09,4B,8C,13,ED,46,4D,67,B7,B9,FA,60,2E,58,CB,1E,FB,95,4E,D4,D6,02,FA,F5,1B,2B,8A,02,52,D7,74,69,31,1C,F0,75,A5,27,61,C9,95,CB,D3,4A,53,29,7B,8F,37,E3,6B,49,35,49,2B,31,10,29,72,DF,97,61,FD,B6,F0,25,97,4C,BF,03,AD,2B,57,83,78,2B,8F,94,6E,E6,8E,5B,FB,80,36,21,01,6B,23,F7,04,1B,5D,D4,FF,DD,78,D6,C9,D7,F0,6A,CB,52,05,40,24,01,86,71,2D,AA,5E,FA,B3,24,F6,73,A7,29,08,3D,83,8E,AF,0B,8C,3E,4B,22,B2,8C,AE,4F,13,6D,58,AB,F9,9C,2A,77,72,63,B9,E1,AE,7C,3D,A6,AC,9B,59,06,14,0B,E3,CA,E5,AB,75,84,34,F9,72,7D,5B,4A,D2,EF,C5,25,BE,73,EE,05,CB,F3,DB,F3,33,36,56,53,2E,C7,F2,E3,9A,6D,61,8B,26,38,47,1D,B3,CF,B5,82,7C,C1,DE,F8,8B,C2,C1,BA,9A,94,D4,76,24,70,BA,C8,57,02,FC,82,4A,39,10,BA,00,D6,95,99,B5,18,92,1D,44,9E,1A,30,A3,2C,56,3C,26,A6,4E,8D,D3,EE,94,CD,D3,7A,E1,78,95,59,50,8D,F3,A7,66,40,89,62,29,02,1B,23,C9,70,6E,17,19,53,C3,02,FA,F7,1C,23,03,8A,D0,22,34,54,33,24,67,2A,2F,27,CE,3D,5F,82,B6,F7,5B,D9,AB,86,06,D2,15,AB,33,79,08,61,99,E2,B5,A6,3E,AF,D0,AF,2A,9C,9A,F7,65,8B,6B,F8,5F,01,C4,5D,76,63,74,4A,FF,9F,6C,13,DF,9D,DB,3E,5E,C7,FF,46,6E,00,E4,58,1F,C A,36,7F,B2,DF,5B,32,D7,FC,EB,1A,11,98,D7,CC,48,C5,89,D5,E4,AA,0B,1D,0E,2A,CC,99,B9,58,BE,B7,6B,51,33,19,7D,B6,65,74,89,03,65,E0,F3,0F,F3,61,96,F8,7C,CC,D9,B9,2F,B6,48,5C,AB,45,65,1E,6F,FF,D7,1B,27,42,F8,60,D2,5F,47,94,01,57,6E,C4,7B,C6,D9,98,D0,EE,81,3C,D3,06,62,74,BE,9D,3E,11,74,6D,98,83,74,3F,32,EE,CB,E3,74,4A,1D,8E,79,7E,5F,29,2A,1E,FD,34,DE,66,DA,8F,87,25,FE,C5,DC,26,F3,6D,66,FF,15,7C,5F,F5,92,A6,CB,BE,AD,C0,4A,F6,82,55,E3,8E,ED,B5,8D,B1,EE,B9,5E,DB,00,6A,21,0A,93,82,4C,14,BC,C9,DE,50,10,B0,DD,06,F6,46,EA,D4,6A,5F,F9,02,FA,6D,4A,E5,41,8C,4A,94,05,12,5F,0A,4F,B7,3C,FF,CB,AD,C3,D8,59,16,DA,44,2E,42,F5,C9,EF,61,1F,15,9B,03,E1,87,69,96,4B,CD,63,F7,EB,97,81,46,86,B2,A5,0A,74,DB,2C,CB,41,D9,82,9E,0B,EC,69,EB,5B,CA,B3,96,6C,71,02,B7,69,40,AB,47,5E,B3,56,7D,55,92,90,23,6D,BD,31,40,B9,26,40,18,D9,55,23,79,BE,E4,1A,F6,27,A1,2B,B5,E2,38,59,98,96,6E,F2,31,BE,FF,6F,A3,29,50,05,98,06,71,8B,30,41,20,86,28,49,3F,11,A8,CB,57,E7,CC,98,B7,11,14,54,56,81,6C,69,9D,8C,97,32,7A,E5,98,EB,89,C3,57,E4,B6,61,21,72,D2,88,12,AB,D2,6F,96,12,31,9A,7A,36,04,CC,FD,61,21,49,8E,19,1E,D9,5B,5C,D4,26,B1,9A,8B,17,DF,64,FA,39,32,93,BD,CA,9E,BE,95,C6,AE,ED,C0,4C,52,EB,D2,71,D7,B2,D6,64,1E,21,E1,A7,5F,E3,D1,E4,CE,50,25,66,FE,2C,19,3A,27,45,B5,1F,7B,09,D8,07,B9,63,5F,5A,B2,FB,C1,E0,ED,47,99

###PAYLOAD_END

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###PLISTEN: Level: 3:

###STATUS: SL: 5, CYC: 1, RQ: 0, REV: 0, LSB: 0, dF: 16.2, CRC: 942C, FRCNT: 1, FRNR: 94

###PAYLOAD1: LEN: 925, TYPE: 8

###PAYLOAD2:

A3,FF,4C,02,FA,EC,84,55,6D,7C,FE,44,B5,98,3F,98,73,2F,30,01,23,6F,8D,82,39,95,0
D,F5,71,31,96,47,22,93,9B,29,3A,91,35,37,50,97,BF,5F,D3,96,AD,9A,F6,54,C2,CA,CC
,4F,3D,6E,3E,67,07,86,60,9B,2A,76,52,B9,DA,D0,DA,0A,8D,E4,E2,FA,7D,28,C0,4C,AD,
A8,8C,34,C9,EC,2D,EB,4F,91,3C,41,FD,FC,57,56,37,D6,AF,B1,61,6E,51,B5,5F,8E,5B,8
0,AA,C6,85,31,9F,6C,E1,A2,77,2F,1A,36,43,10,72,B8,55,6D,4D,03,B5,D6,8D,58,13,EA
,1F,54,88,09,3F,FD,56,3A,47,BE,25,06,D0,F7,3E,F7,B7,FB,56,03,09,26,31,72,4F,8C,
46,BF,1B,23,E7,67,0F,EF,2C,B1,51,62,9B,D7,BD,20,CA,AD,BF,C6,3D,97,58,3C,9A,B9,7
F,93,DC,A2,AE,19,23,50,5B,B8,98,C3,8E,67,09,8D,95,79,8C,E1,50,58,4C,3E,5E,C6,5E
,0F,AA,68,65,81,27,59,43,ED,C1,B7,A5,7B,F3,68,5A,F2,72,83,BF,B7,AB,F0,DC,FC,C9,
1C,14,3C,FE,E7,77,19,DE,48,84,50,4A,C0,5A,44,06,86,E5,02,FA,F7,58,B3,07,03,BA,9
8,66,45,8D,EB,08,FD,69,59,84,31,37,29,7D,0D,8D,7D,F5,09,33,26,26,11,C1,29,67,2D
,9D,E4,71,07,8C,A7,E2,E2,6D,02,62,88,63,B6,62,1A,F0,5C,E4,0D,4C,5F,99,50,75,8F,
83,D9,81,32,76,9C,28,E2,74,75,3D,3F,CB,D8,EF,56,77,F0,D4,8F,5B,D8,58,1B,CA,DA,0
1,48,F2,D0,76,8D,D8,D8,BE,E6,E2,E3,28,23,45,DB,43,2B,65,4B,8F,2C,03,9F,95,76,C9
,99,C8,DD,EA,05,13,5E,EF,26,27,13,61,30,86,BD,5D,ED,60,DD,70,E4,8A,AC,76,8B,65,
EF,53,35,D3,28,DC,EB,3B,0B,49,EC,0E,00,E4,67,D8,04,C2,2B,E3,82,C9,51,9F,0C,DE,D
E,5D,0C,0E,2E,8F,0F,F6,B5,BD,69,BC,D2,10,DF,63,26,7A,C5,53,7F,C9,DB,77,30,F8,78
,B0,A5,CB,B8,5B,6E,FB,27,70,F3,95,54,C8,EC,AD,A9,45,8C,27,4D,78,C2,D9,21,16,60,
D8,82,F2,F5,46,52,39,A0,A0,AE,0E,41,08,EF,BE,CB,B1,79,78,05,6B,4F,D5,88,1E,E6,0
A,59,E3,BD,DB,1A,BF,02,FA,E6,C6,EF,86,C9,D2,53,09,CD,D2,32,25,0A,BE,89,23,35,10
,98,BB,90,1C,96,6F,DE,CA,A3,0D,8B,D5,A0,EC,33,3F,99,40,69,18,48,AD,B2,4F,1B,7F,
8A,2F,72,10,1F,C5,44,A6,11,04,66,5E,32,1E,E5,C3,D2,CB,2F,61,6B,C8,94,37,CA,82,9
E,7F,83,39,4D,A8,01,8B,91,A9,F0,26,3B,4D,CB,07,03,A1,1D,83,F6,47,19,B8,72,64,94
,44,F9,C8,8C,42,27,CE,6E,62,90,65,45,AB,DF,60,9B,6C,A8,64,CA,7B,0A,AA,10,DB,FB,
5F,8D,A5,8C,36,A6,3C,39,C8,F5,6F,7A,FE,DF,2B,D6,4B,5A,42,65,96,0A,62,B6,75,71,4
7,D0,91,71,EF,F4,CC,90,15,57,82,9E,91,66,BF,6C,45,2C,B1,57,13,01,58,D5,AC,71,26
,D6,56,E4,4A,FC,AE,97,92,C8,5C,40,C7,3B,6E,45,BF,8C,3B,64,59,A3,36,60,3D,19,DC,
55,DF,AF,AC,23,94,C5,C5,16,73,EB,AB,A1,53,A1,C1,BD,66,5C,59,E9,72,83,6D,DC,AB,D
7,E5,5D,28,18,9C,77,62,C9,68,F3,10,CB,3A,53,2F,DC,5C,AF,59,A9,A4,02,FA,18,E1,C7
,F3,38,19,57,99,41,9A,BC,7D,C7,1D,49,16,71,CF,49,14,94,E0,E5,69,95,9B,25,7A,C8,
24,5D,DB,20,E7,DD,C1,03,1F,2D,BD,BF,13,55,2B,69,B0,04,EF,26,39,9A,FC,70,F7,F3,B
0,81,11,4A,72,8B,09,AD,C9,51,B1,98,57,4E,7E,B3,EA,E6,B2,DF,67,7A,65,D6,4B,07,B3
,22,D5,A6,61,1D,0F,DA,72,0D,20,AE,CC,23,96,5D,67,9E,C6,1D,BE,A3,36,31,30,87,43,
8E,EF,46,4B,B8,7D,55,DF,E2,2B,97,AE,4E,65,C8,31,FF,A7,7C,F3,F5,09,5F,91,64,4A,5
0,DF,88,19,84,CB,FF,9B,9C,15,91,66,6F,F2,9A,66,08,99,51,4D,E3,F9,50,22,B0,98,55
,F1,9B,2E

###PAYLOAD_END

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###PLISTEN: Level: 3:

###STATUS: SL: 5, CYC: 1, RQ: 0, REV: 1, LSB: 0, dF: 16.0, CRC: 03AC, FRCNT: 2,
FRNR: 95

###PAYLOAD1: LEN: 916, TYPE: 8

###PAYLOAD2:

FA,C3,7F,32,F1,AA,64,2E,56,FF,2A,14,5F,38,97,14,9B,49,86,FE,D5,10,C3,86,90,65,1
0,F2,09,35,45,C9,92,96,B2,05,42,4A,1C,84,F2,B3,2B,72,2F,E2,7F,6B,47,91,6E,6D,21
,26,EC,75,FC,BD,03,EC,95,A7,B5,5E,BA,BF,4B,7A,D1,B4,A7,FC,DA,7E,88,F6,27,20,63,
97,14,BF,18,B4,63,B2,02,FA,6E,89,6C,37,73,43,14,0F,9D,D1,4A,8D,3C,EC,5D,A8,87,2
E,63,01,65,CD,4B,11,9D,7A,8C,DF,EC,C9,07,AF,0B,4F,66,66,E1,65,29,CC,CF,A3,0F,B2
,B5,5F,73,1E,C7,C9,94,94,DA,E0,A0,29,CC,83,88,FC,B4,18,90,46,13,2F,D0,6F,B0,8A,
DE,6B,DF,0A,4A,0A,C9,BA,1B,77,C9,E1,67,67,47,19,F3,0B,78,F8,3B,BF,DB,C0,E3,CC,3
C,61,50,68,AE,CA,03,DF,F1,8A,79,6C,52,03,B8,C6,85,77,2E,BE,E7,19,BB,B2,BF,1E,FF
,D3,6E,6E,02,48,E5,83,A6,CE,19,77,6C,F3,BE,9C,0C,53,F6,79,F8,2F,B3,1B,96,33,1B,
FB,39,6C,A2,D0,21,A7,FF,C3,FF,2B,7E,49,56,3B,D1,1B,1D,F5,55,5F,67,14,62,96,85,2

B, 35, C9, CF, AC, AB, FD, 7E, AF, C6, 7C, BB, AD, B6, D0, 5C, C2, 75, 1C, C8, 6F, 64, EA, 58, A1, B2, 71, 6F, FF, D5, 72, 82, 3B, 14, 4D, 4B, 81, 1F, DA, EE, 50, 38, E0, F2, 68, 11, E2, 7B, B9, 20, 50, 8F, 59, 20, A5, DE, 21, 37, 30, 59, 73, D9, 6F, 25, AC, D6, 31, BA, 0E, 7A, 9F, 5B, CB, 6A, FF, 02, FA, C4, 67, E5, 19, 89, 19, 6C, 95, 72, 5D, A6, 25, 59, 83, 29, 2A, 8A, 88, D1, CD, 33, 9A, FF, 5E, 59, 3E, 59, 46, CF, D9, 04, 13, 1A, E5, 12, E9, C4, CF, D5, F7, 70, 63, B7, DD, 98, C7, 92, B0, BB, 0A, 74, C9, EC, 99, FA, CF, 54, 7F, B9, 98, 4B, 71, F2, 58, 5C, 38, 1B, 1C, 06, 93, 16, 30, D2, E6, 2D, 92, 29, 7E, 1D, DA, F6, B5, E7, 31, 3A, B7, 2E, 2B, AA, 43, 39, 3C, D0, 60, CF, 1E, 84, 4A, 0C, C7, 9A, 2D, B5, D4, D1, 6E, DE, 86, 61, 1D, 23, F6, 67, 0E, FC, F3, 09, 88, 92, C1, 04, A8, C6, 78, A1, 23, B9, 6E, 07, E2, 85, E4, 35, C3, 40, A2, 37, 8C, D9, 39, 14, 16, 3C, 16, C2, B2, 32, 08, 85, 3D, 9C, DF, 53, 0D, 89, 66, 9B, AC, 11, DE, E0, 9B, 90, EF, 62, 9A, 66, E3, AC, 63, 0A, 9E, 5D, 5E, 85, 6D, 4A, 66, 13, D9, 72, 39, 20, 67, D6, 9A, 24, 85, 30, 09, 98, DB, 92, 00, CC, 7A, CA, E4, A4, CA, 1E, 03, 9A, 72, 7D, 25, 7A, 48, 63, 61, 08, D4, F9, 76, DB, 6E, 35, 4D, 18, 7B, EC, 90, 95, 72, 40, 58, 9F, 10, 1D, 9E, 96, 42, 5C, 10, A9, 02, 27, DA, C4, 1B, C2, DE, 86, 97, C6, B6, CB, 93, 68, DB, 02, FA, 2D, 75, B6, BA, 13, 14, 4D, 24, EF, E4, 90, 1A, 64, 6A, 13, D1, 95, 9B, 8F, 7E, 34, 4C, 30, 3A, 37, 4A, D4, 7C, 7C, 21, 83, B3, B1, 8A, 64, 6E, 60, 79, 31, B6, 56, 8E, DC, A1, F0, 33, 0A, D9, D4, C2, E4, 31, 97, 0D, 79, 95, 39, 56, D4, A4, BB, 2E, 35, 09, 5C, 1E, 78, 5A, 45, 61, 23, A6, ED, AD, 61, EC, E5, B2, F5, A6, 0A, A4, FF, CA, 9E, 54, BA, CA, BE, FE, BF, 53, 86, 67, E6, 64, 60, 40, 42, EA, 59, 21, AF, 47, 27, 91, 98, 2D, 89, B2, 28, 99, 0A, B8, 95, 9F, 24, 10, 35, CE, 51, 1C, 7E, 2B, 1F, 2F, 7F, 3B, B8, 82, 1B, 38, 2C, 69, BC, 6A, 15, D3, C6, 4D, E9, F5, 59, 1C, A2, 39, 3F, FF, B7, 2D, 41, 34, 65, 48, 4B, 79, AB, A5, 0F, CB, 22, CA, E2, F4, F5, DF, 9E, 48, E7, 03, FD, 7A, 76, DA, D4, 88, 6C, A2, DA, EB, 6E, EF, 4F, CC, C3, 28, 21, 7E, 4A, 27, 5A, 8C, 57, A9, D5, 29, FF, E7, 94, A4, 91, FE, 32, 1B, DE, D2, 24, 93, E8, 7C, C1, 3E, FC, 1A, 0B, AE, 8C, C5, 44, 61, B0, 93, CA, E7, FB, EE, B6, 34, 19, 81, EE, 13, F9, 57, E6, EE, E2, E6, 4A, 22, BF, CE, 55, 11, EB, 19, 28, 13, 3B, 0A, 02, FA, F7, 6B, 69, 97, F7, 34, A0, E2, 5D, BD, 45, 45, 36, 00, C2, 2C, 1B, 53, 4D, 68, EB, 2C, 34, 74, 29, 2E, 79, 71, 83, C3, A2, D0, 6E, 27, 46, FD, AA, 77, D2, C1, A9, E6, 2E, 63, 56, 18, AD, E9, C8, 17, E9, 1B, B5, C2, 16, 5A, 7D, D9, BA, F6, 40, 05, CF, E8, B2, 5B, 64, FF, 57, EC, A4, 70

###PAYLOAD_END

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###PLISTEN: Level: 3:

###STATUS: SL: 5, CYC: 1, RQ: 0, REV: 1, LSB: 0, dF: 15.5, CRC: 3BBB, FRCNT: 0, FRNR: 96

###PAYLOAD1: LEN: 921, TYPE: 8

###PAYLOAD2:

CE, E5, 25, 37, 75, FC, A3, D7, 02, AE, 29, C7, 30, 02, FA, 94, C9, 35, BF, 35, CC, 42, 39, C2, 71, D1, 30, 9F, 93, 6A, 62, EA, 0F, 56, A5, 31, A9, B9, 36, 12, 7E, 98, A7, DF, 85, 60, 49, 2E, 46, A2, 6E, EE, 14, 1C, 88, CB, E1, 66, 6E, 27, 20, 95, BD, 5F, FA, C9, BE, 31, 68, 9B, 4D, 2D, B5, FC, 35, FF, C1, 38, CD, 1D, 2C, 64, 82, 48, 34, A9, ED, 39, 69, 4E, 2D, 3E, F2, F3, 66, 22, E7, EF, 25, D0, 1D, DC, 74, 27, 1B, 40, C7, E7, 9F, 99, 9E, C3, 43, 63, 36, 4D, 8B, 7C, C6, A2, 75, 7D, E7, 1B, E9, B6, 8A, D5, 87, 74, 40, D6, E5, 39, F9, A4, 58, 1F, 90, AD, F9, CC, DE, 5D, 85, E3, A3, 0A, EE, E1, 52, 66, 31, 9F, 57, 31, 25, B1, CB, 59, 76, 32, 47, CA, D5, CC, 30, AA, D6, E7, D4, 7B, 5E, 11, 09, 32, 0A, 72, 64, BC, 59, 47, 22, 7E, 9F, 94, 3A, DD, 23, 46, B1, CF, 8E, E4, 33, 05, F0, 1A, 37, 2A, CA, 6E, 39, 0F, EE, DA, 87, B3, 06, C2, 9B, 4F, FC, A0, 9B, 72, C1, F2, 6E, B8, 50, 92, E3, F6, 7A, 71, 06, C2, 23, CB, 60, 47, F6, C6, A0, 6C, 51, 7C, 8A, 2F, 36, 9A, FF, A5, 37, DE, 41, BD, 97, A0, B3, 22, 6D, 59, CA, 6F, D7, BB, 91, C6, A9, A6, 20, 4B, B2, 02, FA, E1, 07, EE, 37, BF, 6A, CA, 5D, 04, 56, 1F, 91, 8B, 15, F7, ED, 68, F0, DE, 3E, 3D, A2, 75, EB, E6, 83, DD, A0, 06, EC, 3D, 1E, 7F, 3D, 79, 8D, 36, 7B, FC, E2, 4C, 1C, D4, AD, 35, A2, 53, C6, 54, B1, 22, FD, E2, 97, 83, B1, EF, 5D, 1A, 02, FE, 95, 05, D9, 6F, F7, 9A, 0B, 49, 8F, B7, 7A, 4B, F2, 34, 08, 2F, 32, 4E, 53, 57, 21, B6, A4, 93, A5, 25, 7F, B2, 9C, D9, 1B, FE, CA, 11, B4, 9E, E0, 35, 78, 7D, 5C, 11, 15, C3, 14, 6E, 57, 15, 72, 92, 7C, 5A, AE, 36, 92, CE, C9, 5B, 16, 96, FD, D3, F1, C2, 00, D2, ED, 0A, E1, AB, AD, 39, BC, 55, C1, 97, C8, C8, 2F, E6, 68, AF, CE, E9, 12, 1E, 64, 0B, B5, D6, DF, B3, B3, 84, A6, D3, D3, CB, 1F, EF, F0, 7B, A3, 80, 98, 76, 1D, C9, D3, 86, 7A, 70, 0B, D5, C2, B2, 58, 40, AB, 34, F2, B0, 3C, B2, 58, 67, B6, 67, 24, 42, 4A, 12, 26, 2E, 4F, C9, 93, 82, 33, B5, 9F, 2C, E7, FB, 23, C7, C5, 41, 27, 8A, 50, 3D, 46, C6, 8E, 9A, C2, A8, 93, 2F, A9, 4C, 46, 5B, CA, C4, 93, B5, 12, 6D, 93, F1, B8, 9F, 2A, 8D, C5, ED, D7, 6E, 73, 4C, 51, 75, E7, 30, DA, E6, 65, 02, FA, 43, 59, 0F, 2A, 05, CB, 9F, F4, 8D, 51, 27, 67, 0D, AF, D6, 43, 4D, 79, EE, BC, 52, F2, CB, CC, C5, FA, B3, 97, 3A, B6, 28, FF, 01, 70,

45, F8, 55, 16, 3E, FE, 2C, 25, 7E, 05, 50, 48, 77, F9, 25, E6, F2, 0D, EC, 0E, E6, 3C, 2D, 75, E4, 29, 5
3, 63, 9B, 59, 8F, E6, 52, DB, 8C, 6D, DD, 6D, BB, DC, 30, 0F, DE, 52, C8, DA, 2E, DB, CD, 94, 5C, D5, 64
, A5, 0C, 63, 71, 7B, 34, A8, 13, 2F, 43, 82, 8C, 37, DB, 9B, CC, 1F, 39, 56, 5F, 29, D2, 86, C6, BA, 59,
40, 4D, DA, 7E, 31, C1, 17, C1, F8, 06, 6F, 71, CD, 98, C5, DE, 87, 13, FC, 45, 89, 61, DF, E6, 71, E8, 5
3, 94, 20, 8C, 9B, 7A, A6, 4A, DE, 60, 5B, 6E, 0A, 72, C2, F9, 26, 50, 7D, 33, CD, 56, E2, EF, 8A, 31, A2
, CC, BA, 96, F7, 5B, 0C, 05, FB, B3, 91, FC, B2, BF, 62, 69, 0E, 60, 7E, E4, CD, 6F, 4C, 17, 39, AC, 59,
3C, BF, 70, 54, BE, 54, 70, CD, 9E, DA, 99, CC, E0, 71, 84, FD, 35, A0, 15, 1F, 65, 8A, 8F, 31, BC, E6, A
C, 9B, F6, 65, 37, A5, 47, E3, 8F, 03, 45, 8B, 8C, 70, 25, 6B, AF, EC, 97, 54, 6A, 41, 5E, 6C, AD, 42, 1E
, 9B, B4, A7, 4E, 3C, 02, FA, DD, 1C, AD, DF, AE, F5, EF, 7C, B9, 8E, 5D, 77, BE, 30, CD, 24, 72, 69, AC,
43, EF, C2, 22, F6, 38, DA, 7D, 57, 86, 61, 51, 24, 93, 31, B7, C7, 13, 58, 33, 98, CB, B0, A6, B0, DF, E
0, 14, D8, 54, 4A, BC, 0A, 46, AD, 30, D0, 1F, 4A, E4, 86, EF, 96, 85, 93, 38, 12, 5E, 72, A9, 70, D3, E9
, 7D, C4, CF, 63, 37, 24, E0, 17, D0, AB, 79, DD, 42, C2, A6, 4A, 28, 24, EE, 0E, 64, 7C, 7B, CC, 0A, CA,
61, FD, 59, 66, B2, 52, 95, 92, 89, 82, 07, 00, 7E, C7, CE, 47, BC, 7A, 7E, 2D, 23, CC, 64, A5, 9F, B6, 5
5, 18, D5, BB, 17, 6F, 07, CC, 09, 9A, D0, F4, 01, 96, 38, 41, 86, F2, 5C, 19, B4, B3, 6D, 07, 7D, D6

###PAYLOAD_END

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###PLISTEN: Level: 3:

###STATUS: SL: 5, CYC: 1, RQ: 0, REV: 0, LSB: 0, dF: 16.1, CRC: 6D8A, FRCNT: 1,
FRNR: 97

###PAYLOAD1: LEN: 921, TYPE: 8

###PAYLOAD2:

C3, CA, 05, EA, 27, 32, FF, 26, 53, A8, 92, 9A, 90, 80, BE, E6, 1C, 41, 73, 6B, 09, 9B, A1, 4F, 8D, 43, 3
1, 2A, 8B, F2, 44, 82, B7, 28, A4, 4C, 21, B5, 94, 5B, F5, 3E, AA, 39, 35, 83, 6A, 4B, 0C, 5E, 2F, F4, 2D
, 63, BF, 64, 6F, E7, 7F, E8, 78, DF, 28, 31, E7, 0C, 78, 2C, B2, CA, 41, CC, E6, B2, 8C, 07, 28, 3A, 66,
43, B2, 17, F2, 25, 1E, AE, F3, 0E, C3, 93, 46, 8A, 65, BF, B6, ED, 28, 22, 61, 4C, 02, FA, FD, 18, 65, C
3, D2, 6D, 7E, A6, 70, A4, 9C, 66, 46, D4, 5B, C6, 4C, 9A, 5E, 14, 55, 48, E2, EC, 89, 55, 96, B6, 05, 6D
, 46, 55, A3, 57, B9, 46, C3, BE, BF, 32, 4E, 5B, 6E, B8, B1, 41, C1, 97, F2, DE, 3D, 2D, 6D, 07, 2D, 08,
2B, 80, 64, D9, 84, E5, 1A, 32, 86, 96, 92, 4A, 51, 03, 63, 62, D0, 43, 2E, F2, 45, 4F, 31, 0E, C3, 90, 3
5, 87, 24, E8, 1D, 31, E6, 9D, 74, 52, 54, 59, 61, 34, 54, 39, B5, C2, 93, 38, 3B, 72, DD, 8B, 97, 24, 1D
, 8A, 9B, 6C, 49, 7F, 57, FA, D0, FA, D7, C6, 59, E6, 5C, 12, 00, ED, 33, 30, BC, AB, 4D, D7, E3, 65, 67,
66, 2D, C1, 50, 7E, 37, E9, 8E, 06, CA, 50, FF, AA, 18, 65, E3, 91, BD, CE, DA, 3C, 4B, 47, 3D, 5B, 63, 5
1, 39, 82, 7D, 3D, 33, 27, C2, BD, 91, BD, 28, 3D, 27, F6, 94, 7E, BF, 2D, 27, D4, 35, 85, 5E, 56, 6C, 3A
, 62, 99, 49, 2E, 73, 24, FC, EB, FA, 65, 27, 4A, 79, 39, 89, 46, CC, BC, 4C, 8C, 15, 7F, 6B, 40, B1, 14,
0D, 1D, 8B, 2F, C4, DB, D6, 5C, 68, 75, D9, 50, B7, 9A, B9, 85, C4, 6F, 31, 7B, 7A, F7, FA, 62, 4A, 42, D
D, AB, 17, 0F, 23, 98, 3B, 32, 35, 1A, 02, FA, FB, 89, 5E, 32, BA, EC, 4E, DE, 92, 9E, E5, F5, A1, 52, 61
, 77, 0D, 1B, 65, D6, 01, 73, D7, A3, E6, E8, A4, DF, ED, 79, B6, 3E, B0, 6A, A2, EE, 44, D2, C4, BB, 32,
59, 23, F2, A7, CB, 3B, 6C, 63, 77, 0A, 54, D7, 82, EF, C8, 63, E5, B3, 6E, BD, 31, 20, 87, 63, 23, B6, 1
D, 62, 24, B0, 16, DC, 73, 1B, 83, B3, 23, 73, 0E, 9E, A7, 5F, C6, 37, A4, EF, 79, 71, 89, 61, E4, DE, 15
, AA, A1, 59, 2B, 84, B9, 99, 1C, 7F, 16, 14, EE, 07, 78, 8E, 63, A1, 65, 6E, 48, 1F, E6, A1, 39, 9A, 6F,
25, 0A, 66, 9B, 65, 4B, DB, ED, 26, 5F, 26, 52, DA, CE, AA, F6, 64, 95, 1B, 03, 9A, BF, 2C, EB, 42, C8, E
4, B8, CA, 97, 6F, 12, 4B, CC, BB, 6F, 7C, 8A, 32, 33, 69, 4E, A3, 92, 56, B9, E4, 2A, 90, 15, B5, 3C, 40
, CA, D1, 24, CB, 81, 31, EA, 45, 29, C0, A1, DD, 7A, 8A, DB, 64, 5B, F3, 5B, 0E, BA, 27, 2E, 33, E6, 5B,
26, 44, 7A, 2F, 09, 0A, 77, 3F, 3B, 85, 79, 6D, 42, 56, D4, 3D, A6, 1C, C3, EC, BC, 76, 1E, C7, 77, 95, 5
A, E3, 0D, B9, F6, EE, 1B, 97, 50, 1C, CA, 5C, 36, 1C, C7, 97, A3, FE, 92, 01, 39, B8, 5C, 46, 41, 02, FA
, 74, 8B, B8, F3, 43, 90, 2C, 6B, 81, E6, 7A, B5, EC, 5D, FC, FF, F4, A0, F1, F4, 6E, DD, 2A, 80, D1, 83,
95, 37, 10, C4, CD, 11, 9F, 73, 41, B1, 94, E3, 72, 6F, FC, DC, B1, AA, 0C, E0, D8, 39, 72, E9, F1, D9, A
2, A0, 46, 22, D3, 77, 1B, A8, 39, B4, 76, C6, B9, B0, 4C, 6B, 22, 15, C2, BA, C7, 15, CA, B0, 13, 5B, 88
, F6, 29, 64, 5B, 35, C5, E4, 99, A2, F3, 05, C4, 6B, D8, 14, F6, 6C, BB, DF, AF, 8E, D4, 9B, 7E, 12, AA,
F7, E7, C9, 12, D5, 36, 8C, BE, 18, 7E, B1, B7, B7, AC, B4, 5F, A6, 4F, 94, 2A, 5B, 44, 84, 3B, 8B, F2, 9
4, 87, BE, AC, 52, 73, 35, 99, 91, FC, 91, 4E, 53, D3, 77, 44, C2, 96, C8, 11, 75, 26, BD, CC, B1, 70, 0A
, 06, 40, B1, 78, AF, 25, 5F, 27, 07, 6F, 1E, 13, 35, 5B, 52, 06, 07, DA, EC, 4E, 63, B4, DC, E6, FE, DF,
A2, 54, 3A, CC, 05, 48, BB, 3F, EB, E6, 54, F2, F8, 2D, BB, 49, 02, C3, AF, 7B, D1, 8D, DD, 38, 85, 5E, 3
8, 30, 54, C0, 95, 00, DB, DF, B0, 03, 66, 2A, 2D, 0B, D3, 2C, 98, ED, 32, D3, DA, 05, F5, E3, 8E, 08, 4A

, 70, DA, AD, A3, E5, 15, DC, 3A, AD, F4, 74, 45, E6, 02, FA, 33, 92, 1D, 5E, 9B, 32, 44, 8C, AF, ED, 24, D8, B7, F5, B9, A6, A0, BD, 94, B4, 72, 2C, C7, E9, 24, 68, 1D, B1, 6A, E3, C4, 98, 18, FD, 7E, CB, BF, 5 9, 7E, 92, 72, A5, F1, 2E, CD, 8E, DD, 5D, 91, E6, CC, C1, 7B, E2, E3, E9, 46, FB, 89, A7, 3C, 82, 43

###PAYLOAD_END

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###PLISTEN: Level: 3:

###STATUS: SL: 5, CYC: 1, RQ: 0, REV: 1, LSB: 0, dF: 16.7, CRC: E8EA, FRCNT: 2, FRNR: 98

###PAYLOAD1: LEN: 921, TYPE: 8

###PAYLOAD2:

F4, 6F, F6, 2A, 61, AA, 6C, A2, CC, 74, 98, B9, B9, 89, 65, A1, 1A, 52, E3, A0, 7D, BE, 0A, F2, F8, 6A, A C, B4, 9A, 22, 51, 92, D0, C7, 14, 51, 31, 98, 91, 32, E0, 33, 21, EE, 27, 40, 71, 87, 40, 83, 50, EA, BA , B5, 66, B2, 5E, 3D, 07, 03, 68, AF, 5D, 32, 8D, C6, 8D, B4, E7, CD, 4C, 98, 2D, 47, 8E, 6C, 26, 6C, 00, DB, 4C, 95, 9B, 35, 93, D6, 61, 78, 24, EC, 9D, 07, 2E, EE, 01, 6F, 4E, 40, 95, 96, 4C, 0D, 96, 5E, 83, 5 2, E2, AC, C5, 24, B2, 58, E4, 3C, C6, 98, F6, 8D, 2E, 44, 88, F0, C6, 14, C0, 6E, 18, B1, 72, C3, 19, 56 , 96, C6, 61, 20, EB, 37, 79, 9B, 9F, 60, 97, 8E, 5C, 32, A5, BE, 32, 53, 6E, 44, 1B, 2B, 15, 2A, CA, 65, 79, AC, 80, 5F, 33, 8F, 11, 83, 57, 25, 92, E7, E9, 91, CB, 74, 57, 1B, 28, D6, EB, 41, C5, 47, DA, 4B, C 8, 8F, DA, 02, FA, 2B, 9D, 3E, 6F, CF, 7D, A5, 4B, D8, B7, 95, E9, 26, DE, 29, FE, 30, BB, C7, 1B, 0C, 47 , 45, 2C, D9, 90, 22, E9, EC, B5, C8, AF, 32, E7, 5E, 6B, 83, 68, 76, 98, D6, 0D, D4, 47, 8A, A9, AB, 8B, 93, CB, C4, 8D, 8F, 19, 75, 96, 63, 7B, 16, 74, 9D, 94, AB, 6F, E7, 04, E0, 2E, 64, D2, 4C, 87, EB, 83, 5 3, 67, BF, 0F, D3, EF, E7, D0, 82, EE, 88, 23, 05, 68, 8B, F1, DE, 4E, 16, E5, 29, 36, 4A, 72, CA, 76, 8B , 6C, 7F, 1B, ED, C3, C2, B1, B5, 5C, 56, 0E, 24, 6E, 92, 66, 4C, 66, AB, F2, 8E, 09, 7A, C7, 59, 61, D9, 41, 32, 4A, 34, 3F, 65, D0, F0, 56, 8B, 25, 2E, 62, 5B, A9, 73, 59, 5A, 28, B9, 96, FE, EA, BF, 64, 0B, 5 5, 15, 68, 66, 83, E5, 26, 64, 68, 3E, 50, 93, 98, 2A, 8B, F7, 2A, F2, 0F, 4C, DE, 63, AD, 2A, 2F, BC, 68 , 58, CE, 15, 05, 4E, 63, 4A, 35, 6E, DF, CA, 6C, 7C, 99, 2E, F3, 1C, 79, 50, 90, CB, E8, BA, 34, 61, B8, E5, 3B, EF, 1C, 93, 6C, 6C, 67, E7, 79, 28, AD, C3, 08, B5, A3, B2, C4, B2, 25, B1, 8C, 4D, 12, DB, E3, 0 B, 3E, 40, 5B, 09, A9, 2E, 0E, 49, 9B, 67, DF, 65, D6, 36, 33, D4, 6C, 02, FA, 2E, 09, 3B, B2, 70, A1, 3A , DC, 42, 5A, 9E, D8, 18, 8D, 42, 84, A6, 99, 55, E2, 8F, 38, 98, 24, F0, C5, 81, B2, CD, B1, 9B, F5, DC, 0D, 8D, FC, 12, E0, 6F, 1A, 02, 43, AF, AD, 9C, 29, 9B, 8D, DD, 8E, A9, D3, 57, 4B, 8C, 4E, AF, DA, 3E, 0 6, E9, AE, F3, 19, 30, 9C, 74, B5, 44, CA, 36, 4A, D1, C2, DE, 1D, 79, 64, 56, 19, 98, 86, 92, 72, 8E, CB , A9, 22, F9, E9, 30, 58, CC, 47, 56, 88, 93, 29, 19, 88, 87, 0F, 30, 22, AE, DC, 98, 64, C5, FD, 68, B5, AA, 8F, 2A, C9, 53, 50, B2, 21, 8E, C3, BB, 1E, B5, FF, 36, 33, 1E, A6, 64, CC, C7, 4E, C2, FD, 28, 4D, F 9, A8, 69, 68, A3, A8, 6E, 29, FC, BC, B6, 26, DA, A4, 46, 92, 01, 2B, 9C, BC, 38, 89, EC, 37, E4, 0C, 83 , 67, 1D, 1E, 71, 84, 37, 81, 93, 0E, A6, 4D, 85, 63, 3F, 94, 08, 65, 30, 85, 6F, 47, F6, 51, 27, D7, 28, E8, 71, C7, 17, 08, 9C, 80, 65, 66, 19, 60, 47, 16, 7F, 66, 5E, 7B, 65, C6, AB, F7, 0A, 08, 9D, 70, 90, 4 9, 5B, 22, 87, E9, CA, 39, 19, 60, C7, 6C, AF, 10, A6, 12, 0A, 66, 02, 08, 5A, AC, 6F, 3A, 12, C8, 36, 0C , FB, 82, 17, 2B, CB, D8, 02, FA, AF, C5, 58, B5, F8, 9D, C1, 2B, 3F, FB, 60, 2B, 9D, FA, 6B, D1, 8F, 18, 15, 2D, 55, 52, 20, CC, 27, EE, 52, B8, 23, B3, 88, AE, 8B, BB, F5, FF, D9, C3, EB, 8B, 55, 1E, 87, 79, 5 B, 5D, 8C, 2A, 1E, 24, 78, E4, 4D, 29, 26, 1A, 99, 4A, 30, E2, 84, E2, D9, 77, 50, 4E, 62, BB, D0, ED, 19 , E5, 9B, 68, B9, 1E, C7, B9, 19, 62, 2D, EE, 5C, FD, D7, D0, AE, 63, F7, F3, F7, 1D, EB, C5, D8, 93, 06, 6B, 2E, FE, 6D, 32, E6, 55, CD, 6F, F2, 6A, 65, 11, B1, 6D, 38, 74, 93, 8E, D3, A6, 38, 2C, 67, 2C, 8D, D 1, 35, 5B, 2C, CC, B3, 34, 3E, BD, 89, 29, FB, 86, C9, 93, 20, 72, C4, C0, 96, 8D, 15, 84, BC, 9D, A0, AF , B1, DD, 59, 4C, EE, 4B, A7, 67, 64, 75, FF, F8, 97, CA, 15, 24, 8B, B2, A0, F9, 19, 9A, 52, F5, AB, A1, 8A, 6C, 67, 4A, 05, D7, 53, E5, A7, 6F, 22, CA, 62, 43, FA, F1, 92, 1A, 61, 4D, AF, 01, 90, EA, 8E, 6C, C 1, 0E, 4E, 4F, 39, 61, 7E, 1C, 4B, 42, CB, F8, 2D, 37, C7, 1E, D5, 6A, 1E, 2A, FF, 81, CD, B2, 85, C6

###PAYLOAD_END

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###PLISTEN: Level: 3:

###STATUS: SL: 5, CYC: 1, RQ: 0, REV: 0, LSB: 0, dF: 16.5, CRC: 5332, FRCNT: 3, FRNR: 99

###PAYLOAD1: LEN: 921, TYPE: 8

###PAYLOAD2:

24,8E,DD,4F,CB,D9,53,AB,77,FD,9B,B9,20,E9,8D,43,97,1C,B1,8F,22,86,02,FA,62,8B,8
A,DA,4F,5A,56,BC,0F,E2,4D,8A,1E,8A,58,06,48,56,6E,B6,FC,6A,FC,FB,9D,8D,5B,68,42
,44,9B,A1,E2,EC,AA,AF,47,83,B0,55,C5,80,A0,6E,E2,04,98,96,61,95,03,0A,EC,39,1D,
3A,7E,68,66,35,43,EF,30,9F,F3,3E,BB,59,6D,40,BF,D1,2D,43,68,95,89,75,71,4C,3F,2
A,A3,97,CB,73,36,CC,4B,94,05,52,11,45,91,8D,9E,AC,DE,1A,13,B2,BB,26,F3,76,4A,D4
,CE,3B,B6,FD,49,86,85,B7,94,D6,F7,7C,E3,56,4A,A7,CD,7D,6F,94,35,92,BD,B6,33,05,
3C,BF,B9,1B,B5,90,A8,FA,56,E8,92,5D,4E,E6,95,B2,63,0A,EC,4E,0E,6B,00,5F,A7,A1,F
A,FB,EE,0D,33,CA,57,FA,C9,FC,82,FE,8A,52,1B,05,53,36,5F,B3,E9,29,5C,FD,34,9E,E4
,8B,C1,5C,55,43,33,05,29,F5,A2,82,38,F6,34,DD,30,28,D0,2C,9E,4C,0D,71,D1,2D,3D,
8F,42,94,D7,5A,61,0A,12,9F,A6,23,DB,B0,5A,CF,22,60,26,3B,8E,7F,99,BB,93,52,61,F
E,2E,C6,F1,26,17,F5,B1,9F,55,74,02,FA,6D,DC,DC,BF,E3,C1,DB,AE,90,97,F6,14,5E,76
,B2,F7,2D,6F,32,75,B2,30,B1,B6,A1,82,41,F6,A7,E2,92,55,98,EE,DE,1E,77,2A,EA,17,
FC,8D,1C,51,7B,80,77,28,7B,35,DA,14,80,59,59,ED,06,75,B1,67,A3,F8,1B,B5,BA,0F,A
E,98,53,73,6F,D2,B8,B4,D9,32,89,BC,05,B9,A0,A6,F0,31,5E,3D,4F,D9,44,D5,33,41,FB
,97,F9,0C,7B,B7,F2,FB,08,C6,91,DA,74,70,23,15,22,9B,59,38,57,65,9A,75,07,0A,C9,
D4,72,39,B4,17,1F,F2,17,57,8E,DB,CA,55,29,8E,8F,B5,52,0A,B6,F7,1F,4E,3C,82,DB,7
6,C8,9F,CE,E2,0E,3C,2C,A9,EC,4E,73,1D,B2,3E,CC,17,C6,39,4E,42,E2,37,30,56,6E,B3
,A6,7D,AE,33,36,AA,85,34,8C,27,DC,B6,DC,60,75,35,59,06,16,D2,6D,2B,21,5C,AE,60,
4D,EA,07,E1,CC,EF,F1,BC,5E,97,76,5E,61,98,9B,DE,B8,B6,54,F4,56,86,47,95,E6,4C,F
5,8C,56,13,A1,31,B0,A6,50,95,AC,39,C4,D6,17,70,09,AA,93,5E,4F,39,DC,90,34,9F,02
,FA,5B,60,E0,0E,77,57,C2,EA,56,26,E3,8C,D2,E6,54,BD,6A,6B,3A,B5,AC,64,E2,97,F1,
42,11,E0,76,19,7E,1F,F1,C6,75,4B,AD,61,92,5A,A0,E9,46,0D,A6,E7,AB,0F,E2,DD,90,2
9,B9,65,6B,DA,C3,12,FB,2D,31,15,68,A0,98,38,30,E5,FE,55,6D,E4,15,B1,1F,3F,A1,3F
,AF,4E,43,5E,4C,E0,6B,26,ED,EE,10,E4,E9,67,B8,3E,72,07,CD,C9,B3,8A,7C,A4,3D,7D,
96,0C,6C,E4,FC,7D,F6,16,40,A6,D2,E1,55,9F,FC,61,83,73,FD,19,39,5A,BA,FE,3C,F2,A
C,5F,E2,52,70,19,6C,CB,83,90,29,4A,D6,1B,74,BF,BA,1F,CC,0F,DB,B0,6A,53,D8,A7,83
,49,7B,46,F9,E3,4D,C4,68,35,3D,68,B6,8D,B2,BC,C1,E3,57,6D,A5,A8,A0,54,23,BD,56,
84,5B,A5,42,9C,2F,C3,4D,1B,09,A6,60,C3,AD,BB,59,0C,24,0D,8A,B7,22,6D,61,C6,5B,4
2,6B,44,C5,C9,DA,EF,73,B4,36,42,EE,56,20,6E,E4,9D,CC,45,91,39,4E,D3,1A,F3,CD,67
,CA,83,BF,9C,B2,F0,0B,9D,7A,36,B5,CE,D2,09,02,FA,29,AF,4D,88,A9,37,73,78,E5,8B,
53,70,93,64,6A,DB,2E,D9,06,76,B1,B3,C6,2F,4C,FB,C0,6A,99,47,34,49,B8,7F,FE,55,F
6,79,6D,8E,A1,FB,2C,BF,CA,E3,A7,2C,D0,D9,37,E5,26,74,F0,A8,6D,9C,4D,6F,4C,8F,B3
,03,02,67,0A,1F,B9,08,8B,8A,E4,76,BE,A9,D9,55,9A,BC,25,F5,C8,F8,D8,C9,7D,03,B6,
B9,71,39,53,9E,6F,B0,4B,84,38,AE,58,7E,CB,1C,B0,58,C3,D3,8A,AC,A8,8A,4C,B7,46,C
1,83,24,CE,03,72,6A,6D,F2,17,A6,2F,A9,11,59,72,D1,37,56,01,A6,6F,01,99,4A,B2

###PAYLOAD_END

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###PLISTEN: Level: 3:

###STATUS: SL: 5, CYC: 1, RQ: 0, REV: 1, LSB: 0, dF: 16.5, CRC: 8E4E, FRCNT: 0,
FRNR: 100

###PAYLOAD1: LEN: 574, TYPE: 8

###PAYLOAD2:

5A,3C,E6,AC,B0,C5,1C,6B,5A,89,72,D6,84,37,35,07,E8,9E,D1,1B,8A,0E,70,A2,61,E5,F
6,C9,5E,E6,06,A2,A1,2D,EA,66,48,0A,BF,D6,E2,CE,FD,8D,D7,25,24,87,2B,36,C7,19,5A
,36,9B,0C,D3,AF,32,73,6A,A2,A9,AC,EF,8C,6E,00,F5,62,A4,A3,85,96,04,B3,8D,65,74,
23,6A,A4,38,DC,41,05,6E,F2,25,54,96,3B,52,9F,F7,B8,01,87,0D,25,C5,01,2E,90,2D,2
0,07,9D,CA,02,FA,60,CF,85,21,C9,E2,EC,51,D5,1D,84,4E,46,F5,F2,D5,EB,4F,1C,40,7D
,64,9F,8F,96,21,48,41,E1,05,73,EE,39,6B,3A,24,DC,5B,5F,C4,A7,01,64,C6,F8,39,0D,
35,4E,33,C4,A7,FA,FD,2B,6B,D9,52,68,5F,49,58,74,DF,F0,62,1B,B4,9C,38,07,38,44,3
D,E3,29,8D,56,91,8E,5A,18,8B,0E,67,E1,50,AD,11,8E,5F,C2,02,FC,B9,AF,B2,28,D3,FB
,42,4D,25,B8,60,C4,97,F3,E1,68,6D,41,36,A2,D3,6B,35,1A,D0,6D,BA,23,41,D1,4D,C6,
96,D8,9F,6E,4F,82,7B,73,17,0F,1F,E0,C2,78,EE,15,6B,FE,DC,10,A4,93,02,42,90,36,B
F,47,28,ED,4B,7B,A8,DB,6B,FA,B4,C6,D4,B0,E0,B7,01,43,A7,8D,C6,5E,52,4A,DF,03,50

, 5E, DC, 9C, D6, C1, 4C, F5, A3, 82, EE, D2, 95, 7C, 16, 48, 6D, 53, B2, 85, F9, 4E, E1, 81, BA, 93, E3, A8, 96, DA, 6A, 43, 59, BE, 70, 31, 2A, F8, 36, AA, 83, 22, FC, 60, 85, 33, C7, E6, C8, 63, 1D, E2, 39, 96, C9, F7, 29, A6, 72, B5, EB, 77, B6, A4, 62, 94, 2E, BC, 30, FF, 36, 78, 02, D1, 14, 07, 85, C0, 49, AD, 11, 62, 76, EB, 46, B3, 59, 02, 44, 3D, 1F, CD, 73, 55, C3, 01, BD, 74, 52, 60, CD, 7F, C9, 36, 9C, A7, C6, 50, A4, ED, A6, ED, C4, C0, 52, 8E, 7D, 35, 64, A4, 51, E3, 58, 90, 39, E2, 1C, 61, 97, 27, 65, 89, 8B, 5F, 53, 2F, 00, DE, F9, A8, A7, CB, 7B, C4, 75, ED, 7D, 95, 3B, F8, 52, C7, 87, 50, 54, F6, E5, 19, 56, 9B, 81, 6F, 8A, E3, 17, 14, AB, 07, 6D, 54, 0F, D2, 22, D9, 89, D9, 28, 2F, 3C, E2, 90, 0C, AA, F0, C1, 5B, 0B, 76, 1B, DB, 65, 34, D2, 6D, 2C, 56, 3D, AE, BE, 4D, 84, A2, 5D, 5E, 7D, 3D, 2D, AE, E3, ED, CA, 05, 93, D9, A6, BF, 50, E6, AE, 60, 1F, 47, 0E, 1C, BB, 05, 52, 49, 5A, BF, DC, AD, FD, 0A, C6, 9F, FE, 5B, 9E, 49, 1E, 68, 62, 87, D1, 33, 65, 9E, 3D, A6, D3, 1C, 95, E6, 9F, A6, E7, AD, 7B, 84, 96, 65, 68, 0E, 1F, D7, 6F, 29, 78, A1, 2A, FC, FE, 8B, 15, 37, 27, C9, C0, 7F, AF, F0, 50, 04, 84

###PAYLOAD_END

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###PLISTEN: Level: 3:

###STATUS: SL: 5, CYC: 1, RQ: 1, REV: 0, LSB: 0, dF: 16.4, CRC: 8E4E, FRCNT: 0, FRNR: 101

###PAYLOAD1: LEN: 574, TYPE: 8

###PAYLOAD2:

5A, 3C, E6, AC, B0, C5, 1C, 6B, 5A, 89, 72, D6, 84, 37, 35, 07, E8, 9E, D1, 1B, 8A, 0E, 70, A2, 61, E5, F6, C9, 5E, E6, 06, A2, A1, 2D, EA, 66, 48, 0A, BF, D6, E2, CE, FD, 8D, D7, 25, 24, 87, 2B, 36, C7, 19, 5A, 36, 9B, 0C, D3, AF, 32, 73, 6A, A2, A9, AC, EF, 8C, 6E, 00, F5, 62, A4, A3, 85, 96, 04, B3, 8D, 65, 74, 23, 6A, A4, 38, DC, 41, 05, 6E, F2, 25, 54, 96, 3B, 52, 9F, F7, B8, 01, 87, 0D, 25, C5, 01, 2E, 90, 2D, 20, 07, 9D, CA, 02, FA, 60, CF, 85, 21, C9, E2, EC, 51, D5, 1D, 84, 4E, 46, F5, F2, D5, EB, 4F, 1C, 40, 7D, 64, 9F, 8F, 96, 21, 48, 41, E1, 05, 73, EE, 39, 6B, 3A, 24, DC, 5B, 5F, C4, A7, 01, 64, C6, F8, 39, 0D, 35, 4E, 33, C4, A7, FA, FD, 2B, 6B, D9, 52, 68, 5F, 49, 58, 74, DF, F0, 62, 1B, B4, 9C, 38, 07, 38, 44, 3D, E3, 29, 8D, 56, 91, 8E, 5A, 18, 8B, 0E, 67, E1, 50, AD, 11, 8E, 5F, C2, 02, FC, B9, AF, B2, 28, D3, FB, 42, 4D, 25, B8, 60, C4, 97, F3, E1, 68, 6D, 41, 36, A2, D3, 6B, 35, 1A, D0, 6D, BA, 23, 41, D1, 4D, C6, 96, D8, 9F, 6E, 4F, 82, 7B, 73, 17, 0F, 1F, E0, C2, 78, EE, 15, 6B, FE, DC, 10, A4, 93, 02, 42, 90, 36, BF, 47, 28, ED, 4B, 7B, A8, DB, 6B, FA, B4, C6, D4, B0, E0, B7, 01, 43, A7, 8D, C6, 5E, 52, 4A, DF, 03, 50, 5E, DC, 9C, D6, C1, 4C, F5, A3, 82, EE, D2, 95, 7C, 16, 48, 6D, 53, B2, 85, F9, 4E, E1, 81, BA, 93, E3, A8, 96, DA, 6A, 43, 59, BE, 70, 31, 2A, F8, 36, AA, 83, 22, FC, 60, 85, 33, C7, E6, C8, 63, 1D, E2, 39, 96, C9, F7, 29, A6, 72, B5, EB, 77, B6, A4, 62, 94, 2E, BC, 30, FF, 36, 78, 02, D1, 14, 07, 85, C0, 49, AD, 11, 62, 76, EB, 46, B3, 59, 02, 44, 3D, 1F, CD, 73, 55, C3, 01, BD, 74, 52, 60, CD, 7F, C9, 36, 9C, A7, C6, 50, A4, ED, A6, ED, C4, C0, 52, 8E, 7D, 35, 64, A4, 51, E3, 58, 90, 39, E2, 1C, 61, 97, 27, 65, 89, 8B, 5F, 53, 2F, 00, DE, F9, A8, A7, CB, 7B, C4, 75, ED, 7D, 95, 3B, F8, 52, C7, 87, 50, 54, F6, E5, 19, 56, 9B, 81, 6F, 8A, E3, 17, 14, AB, 07, 6D, 54, 0F, D2, 22, D9, 89, D9, 28, 2F, 3C, E2, 90, 0C, AA, F0, C1, 5B, 0B, 76, 1B, DB, 65, 34, D2, 6D, 2C, 56, 3D, AE, BE, 4D, 84, A2, 5D, 5E, 7D, 3D, 2D, AE, E3, ED, CA, 05, 93, D9, A6, BF, 50, E6, AE, 60, 1F, 47, 0E, 1C, BB, 05, 52, 49, 5A, BF, DC, AD, FD, 0A, C6, 9F, FE, 5B, 9E, 49, 1E, 68, 62, 87, D1, 33, 65, 9E, 3D, A6, D3, 1C, 95, E6, 9F, A6, E7, AD, 7B, 84, 96, 65, 68, 0E, 1F, D7, 6F, 29, 78, A1, 2A, FC, FE, 8B, 15, 37, 27, C9, C0, 7F, AF, F0, 50, 04, 84

###PAYLOAD_END

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###PLISTEN: Level: 3:

###STATUS: SL: 5, CYC: 0, RQ: 0, REV: 1, LSB: 0, dF: 16.0, CRC: 2F6D, FRCNT: 1, FRNR: 102

###PAYLOAD1: LEN: 0, TYPE: 0

###PAYLOAD2:

###PAYLOAD_END

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###PLISTEN: Level: 3:

```
###STATUS: SL: 5, CYC: 0, RQ: 1, REV: 0, LSB: 0, dF: 16.1, CRC: 2F6D, FRCNT: 1,
FRNR: 103
###PAYLOAD1: LEN: 0, TYPE: 0
###PAYLOAD2:

###PAYLOAD_END
pú
###PLISTEN: Level: 3:
###STATUS: SL: 3, CYC: 0, RQ: 0, REV: 0, LSB: 0, dF: 16.1, CRC: 141F, FRCNT: 1,
FRNR: 104
###PAYLOAD1: LEN: 0, TYPE: 0
###PAYLOAD2:

###PAYLOAD_END
pú
###PLISTEN: Level: 3:
###STATUS: SL: 3, CYC: 0, RQ: 1, REV: 1, LSB: 0, dF: 16.6, CRC: 141F, FRCNT: 1,
FRNR: 105
###PAYLOAD1: LEN: 0, TYPE: 0
###PAYLOAD2:

###PAYLOAD_END
pú
###PLISTEN: Level: 3:
###STATUS: SL: 3, CYC: 0, RQ: 1, REV: 0, LSB: 0, dF: 16.7, CRC: 141F, FRCNT: 1,
FRNR: 106
###PAYLOAD1: LEN: 0, TYPE: 0
###PAYLOAD2:

###PAYLOAD_END
pú
###PLISTEN: Level: 3:
###STATUS: SL: 3, CYC: 0, RQ: 0, REV: 1, LSB: 0, dF: 16.3, CRC: 6480, FRCNT: 2,
FRNR: 107
###PAYLOAD1: LEN: 0, TYPE: 0
###PAYLOAD2:

###PAYLOAD_END
pú
###PLISTEN: Level: 3:
###STATUS: SL: 3, CYC: 0, RQ: 1, REV: 0, LSB: 0, dF: 16.7, CRC: 6480, FRCNT: 2,
FRNR: 108
###PAYLOAD1: LEN: 0, TYPE: 0
###PAYLOAD2:

###PAYLOAD_END
pú
###PLISTEN: Level: 3:
###STATUS: SL: 3, CYC: 0, RQ: 1, REV: 1, LSB: 0, dF: 17.2, CRC: 6480, FRCNT: 2,
FRNR: 109
###PAYLOAD1: LEN: 0, TYPE: 0
###PAYLOAD2:

###PAYLOAD_END
pú
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###PLISTEN: Level: 3:
###STATUS: SL: 3, CYC: 0, RQ: 1, REV: 0, LSB: 0, dF: 17.1, CRC: 6480, FRCNT: 2,
FRNR: 110
###PAYLOAD1: LEN: 0, TYPE: 0
###PAYLOAD2:
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###PAYLOAD_END
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```
###PLISTEN: Level: 3:
###STATUS: SL: 3, CYC: 0, RQ: 0, REV: 1, LSB: 0, dF: 16.7, CRC: 141F, FRCNT: 1,
FRNR: 111
###PAYLOAD1: LEN: 0, TYPE: 0
###PAYLOAD2:
```

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###PAYLOAD_END
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###PLISTEN: Level: 3:
###STATUS: SL: 3, CYC: 0, RQ: 0, REV: 0, LSB: 0, dF: 16.5, CRC: 6480, FRCNT: 2,
FRNR: 112
###PAYLOAD1: LEN: 0, TYPE: 0
###PAYLOAD2:
```

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###PAYLOAD_END
```

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**APPENDIX 5 : FLDGI / FLMSG COMPRESSED ARQ TRANSFERRED FILE,AND
INTERMEDIAT COMPRESSED CHARACTERS RECEIVED BY UNSUCCESSFUL
MONITORING STATION**

FILE RECEIVED BY INTENDED RECIPIENT:

<flmsg>4.0.14

:hdr_fm:21

NF4RC 20191509011647

:hdr_ed:21

NF4RC 20191509004151

<blankform>

:mg:1545 TEST MESSAGE de kx4z testing forms

Four score and seven years ago our fathers brought forth on this continent, a new nation, conceived in Liberty, and dedicated to the proposition that all men are created equal.

Now we are engaged in a great civil war, testing whether that nation, or any nation so conceived and so dedicated, can long endure. We are met on a great battle-field of that war. We have come to dedicate a portion of that field, as a final resting place for those who here gave their lives that that nation might live. It is altogether fitting and proper that we should do this.

But, in a larger sense, we can not dedicate -- we can not consecrate -- we can not hallow -- this ground. The brave men, living and dead, who struggled here, have consecrated it, far above our poor power to add or detract. The world will little note, nor long remember what we say here, but it can never forget what they did here. It is for us the living, rather, to be dedicated here to the unfinished work which they who fought here have thus far so nobly advanced. It is rather for us to be here dedicated to the great task remaining before us -- that from these honored dead we take increased devotion to that cause for which they gave the last full measure of devotion -- that we here highly resolve that these dead shall not have died in vain -- that this nation, under God, shall have a new birth of freedom -- and that government of the people, by the people, for the people, shall not perish from the earth.

Abraham Lincoln
November 19, 1863

=====monitor capture file =====

~1cNF4RC;KX4Z;1389;1178~4

^r r rB

e±~1CKEJ;Nn 4RC;19+1~4à

~1cNF4RC;KX4Z;1389;1178~4

^r r !rB+r cc nu0 ßwCKX4D4RC0

9gîr d

~1cNF4RC;KX4Z;1389;1178~4

^r u!rB

~uaaKEtdzJJq4EC;1951~4
^ei xt

~1cNF4RC;KX4Z;1389;1178~4
^r

~1CKX4Z;NF4RC;1951~4
^r

~1BNF4RC;KX4Z;001;ARQ:FILE::FLMSG_XFR
ARQ:ENCODINGCBA4~4
^r

~1AKX4Z;NF4RC;001;161B~4
^r

~1BNF4RC;KX4Z;002;::ASCII
ARQ:SIZE::1316
ARQ::STX
0909~4
^r

~1AKX4Z;NF4RC;002;E61B~4
^r

~1BNF4RC;KX4Z;003;[ARQ:fn NF4R
n-201909, x/204141L-1BCB5~4

~1AKX4Z;NF4RC;003;761A~4
^r

k1BNF4RC zX4Z;00 d;.b2s]<fdBeg>4.0.14

~1AKX4Z;NF4RC;004;4618~4
^r

~1BNF4RC;KX4Z;005;F4RC 20191509011647
:hdr_ed:21
D380~4
^r

~1AKX4Z;NF4RC;005;D619~4
^r ea n

~1BNF4RC;KX4Z;006;NF4RC 20191509004151
Iblankformm8EC~4
^r

~1AKX4Z;NF4RC;006;2619~4
^r ÄLo1

~1BNF4RC;KX4Z;007;
[b64:start]
AUxaTUEAAAYTXQAAQAA2411~4
^r

~1AKX4Z;NF4RC;007;B618~4

^r L

~1BNF4v3;KX4Z;008;AHRtI46CsXboqjnjjvQmyP
/ZsP2c/o587E4B9~4

^r

~1AKX4Z;NF4RC;008;461D~4

^r

~1BNF4RC;KX4J;009;YHliX1BbJU1
3qTa0nPKywmZlyNbZtitE54~4

^r

~1AKX4Z;NF4RC;009;D61C~4

^r

~1BNF4RC;KX4Z;010;cxrEa9rs9fvXVnfuu3pno
moROGm5ioAXECE^a14

^r

~1AKX4Z;NF4RC;010;464B~4

^r qæ

~1BNF4CC;KX4Z;011;W1oAzHyHfqSJPK
QmPP0q7BvWNRlu0+04E1A~4

^r

~1AKX4Z;NF4RC;011;D64A~4

^r na

~1BNF4RC;KÚxZ;012;H6¹f1e/NVosW1IdyXlAh
BMwp5cMkGRbEF6A0~4

^r

~1AKX4Z;NF4RC;012;264A~4

^r

~1BNFC;KX4Z;013;0twkjcWIC9yZB8z
g6ssnxa4hRrYd7zM8B9D[4

^r

~1AKX4Z;NF4RC;013;B64B~4

^r &1 q

~1BNF4RC;KX4Z;014;+/upyjn5yhS2VHdGwBjg
mRLnw2/t/MXR8F1E~4

^r

~1AKX4Z;NF4RC;014;8649~4

^r

~1BNF4RC;KX4Z;015;xAp1bI/E5IroKA
iur6e0apd0BE19p023F~4

^r

~1AKX4Z;NF4RC;015;1648~4

^r Äena
~1BNF4RC;KX4Z;016;1pqRJcHj2w:F5J6dw2Hx
A5XNIgdr tMC7FEB4x
^r
~1AKX4Z;NF4RC;016;E648~4
^r e MFcuu
~1BNF4RC;KX4Z;017;50bcQwNJpvbFCzN8T
myAwy8uNxCb+vw0]A9~4
^r
~1AKX4Z;NF4RC;017;7649~4
^r
~1BNF4RC;KX4Z;018;1B6WZHfXnXZRsiWsf6sP
seELcWgBjnpv74B9~4
^r
~1AKX4Z;NF4RC;018;864C~4
^r
~1BNF4RC;KX4Z;019;Fr/X5V8E8pmRQsCXIX
CNdUeBnIO7tQy7B11~4
^r
~1AKX4Z;NF4RC;019;164D~4
^r
~1BNF4RC;KX4Z;020;RpENkO6FVqEAwgM1qbx
aoQwhiu3hTj5vA51A~4
^r
~1AKX4Z;NF4RC;020;46BB~4
^r e
~1BNF4RC;KX4Z;021;03Ck kfzj9eV1C5yieby
OAXBpdrHi1/RAD63~4
^r
~1AKX4Z;NF4RC;021;D6BA~4
^r
~1BNF4RC;KX4Z;022;dmwrEk7nox2bMPDnCI0
Vd5+WWQMiahgGEC29~4
^r
~1AKX4Z;NF4RC;022;26BA~4
^r
~1BNF4RC;KX4Z;023;uL2nxMa7MYDud333C2j
T
t9XSKQfWhfG0607~4
^r
~1AKX4Z;NF4RC;023;B6BB~4

^r

~1BNF4RC;KX4Z;024;6iB9RULr9/BhbHDWSUT
YEhtNEDp0oBOG1769~4

^r

~1AKX4Z;NF4RC;024;86B9~4

^r

~1BNF4RC;KX4Z;025;dlsFxfhw nKIv89NZJG0r
Da30t

~1AKX4Z;NF4RC;025;16B8~4

^r

~1BNF4RC;KX4026;pTIQyBDeDZfuMibJBCaC9
+BbI140crjGx8(

~1AKX4Z;NF4RC;026;E6B8~4

^r

~1BNFC;KX4Z;027;s+HSttDxFmdrf7diez60Qm
S
rMgBisI90C1

~1AKX4Z;NF4RC;027;76B9~4

^r

~1BNF4RKX4Z;028;sRNlQac15IgsHUSdinv
e23soY2p

~1AKX4Z;NF4RC;028;86BC~4

^r

~1BNF4RC;KW4Z;029;psQror/3h02nP8QDudR
+yKbfl/~

~1AKX4Z;NF4RC;029;16BD~4

^r

~1BNF dRC;KX4Zea0;5PCC7a
P0eP1mqIfpdCE/xS/e\$r

~1AKX4Z;NF4RC;030;86EA~4

^r

~1BNF4RC;KX4Z;031;wm06gMgXSA7BkuarZP
Zqh2iiCo4

~1AKX4Z;NF4RC;031;16EB~4

^r

~1BNF4RC;KX4D;032;9I03/W55DPB7iU6vVTB
x35WNYnK0dKf/99AE~4

^r

~1AKX4Z;NF4RC;032;E6EB~4

^r

~1BNF4RC;KX4Z;033;Wf3ugb2srffc0zym6P6HB
2Mmv1
HiIQT7C93D~4
^r

~1AKX4Z;NF4RC;033;76EA~4
^r m b

~1BNF4RC;KX4Z;034;AQLzMFwMJ97rRc30nm
gM0PpaXNCjqXZ9756B~4
^r

~1AKX4Z;NF4RC;034;46E8~4
^r

~1BNF4RC;KX4Z;035;eHG1eP/UzB1HIRg2Wc1u
Ata1/7
GRUQ66A17~4
^r

~1AKX4Z;NF4RC;035;D6E9~4
^r

~1BNF4RC;KX4Z;036;/j4vZwEHfFzL4u/Ogwur
+d5f5jQvbJWY42E6~4
^r

~1AKX4Z;NF4RC;036;26E9~4
^r

~1BNF4RC;KX4Z;037;maTD1cXxoavPLeZ4qzP
PePqZkHD
9edX764B~4
^r

~1AKX4Z;NF4RC;037;B6E8~4
^r
~1BNF4RC;KX4J;038;1AqXpa49Uu+1+f4U5EBS
bGx/aXKeyDp4AE5D~4
^r

~1AKX4Z;NF4RC;038;46ED~4
^r

~1B4RC;KX4ZN539;Xc9BdcS5rxi+hnof0WzwQ
PaNYKGm
Nf/F4DF~4
^r

~1AKX4Z;NF4RC;039;D6EC~4
^r /

~1BNF4RC;KX4Z;040;XSqAlxrDM2gXtklPI4SA2I
l2uc0SMTmL25CC~4
^r

~1AKX4Z;NF4RC;040;475B~4

^r

~1BNF4RC;KX4Z;041;ZCxIQMqc0l1sJpakcYw+
XgE0+/xtJ

x06AB1~4

^r

~1AKX4Z;NF4RC;041;D75A~4

^r i

~1BNF4RC;KX4Z;042;h4HbGM+i+6c2PzCV1Hh
ZxyCh9bX4MIHtB7C7~4

^r

~1AKX4Z;NF4RC;042;275A~4

^r na

~1BNF4RC;KX4Z;043;n+LHusfnkJULvY0S7wI
r3gA==

[b64:CC39~4

^r

~1AKX4Z;NF4RC;043;B75B~4

^r

~1BNF4RC;KX4Z;044;end]ARQ: :ETX
F420~4

^r

~1AKX4Z;NF4RC;044;8759~4

^r

~1dNF4RC;KX4Z;1B7D~4

^r

~1DKX4Z;NF4RC;D2A4~4

^r

APPENDIX 6: CALIBRATED S-METER FOR REPRESENTATIVE ICOM 718

Radio calibrated with Siglent SSA3021X-TG Spectrum Analyzer and fixed attenuators.

Important for analyzing SNR differences between stations in experiment

This calibration was useful in understanding the potential level of fading in dB; the minimum discernible signal (MDS) however is many many dB below the bottom point on this curve, and was not accurately measured in this simple calibration. The S meter calibration shows that 1 S unit definitely cannot be assumed to be 6 dB.

