

# EARS Newsletter

Welcome to the EARS, (Emerald Amateur Radio Society), newsletter. This newsletter is a collaborative on-line effort. Each area is updated by by the listed individual in real-time. All updates should be completed no later than a day or so prior to our meetings, which occur on the third Tuesday of each month. [See our calendar](#) for more information on meetings and club events.

Given this is an on-line newsletter, updates can come at any time! Just check back in and look for the last updated date in each section. We hope you enjoy this newsletter. If you have suggestions please send them to xxx@emerald-ars.us.

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## President Notes

by Jeff, NT7B.

### Welcome to the Newsletter

I'm sure the club has produced a newsletter at some time in the past, but it's been long enough that it seems like an all-new venture for me. I hope to contribute something interesting to read in another issue, but for now I'm content with putting out a huge "Thank You!" to Dave Cole for assembling the web page and the members contributing content for all to enjoy. We're fortunate to have club members with so much knowledge and experience with so many of the different niches within the Amateur Radio Service.

## **Meeting Agenda for June 21, 2002**

**EARS Meeting Agenda, June 21, 2022**

**Call to Order and President's Opening Comments.**

**Roll Call / Introductions.**

**Program:** To be announced. Bob's Tower Project presentation has been postponed.

**Announcements.**

**Minutes of May meeting.**

**Reports:** Treasurer, Volunteer Examiners, EARS Net.

**Membership Readings.**

**Old Business:**

- Getting the shack EmComm ready: Where are we with computers and setting up HF packet? We have a VHF packet / WinLink setup with the old laptop and Kenwood, but does anyone remember how to run it?
- Repeater Update
- Memorandum of Understanding with the city
- Cascadia Rising 2022

**New Business:**

- Raffle! ARRL gift card donated by NK7Z. Thanks Dave!
- Programs for future meetings
- Website

- Sea-Pac reports

**Good of the Order, Brags, Etc.**

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## Vice President Notes

By Doc, W7DOK.

### Greetings from your VP:

I am both honored and privileged to serve the club as Vice President in 2022.

I hope this year finds new members joining our ranks and sharing their interest in the hobby. If a person has an interest in Amateur Radio and is in need of information, EARS is a good place to go. We are fortunate to have had a number of new members join so far this year and bring new energy and diversity of interest to the club as well as the hobby. Bringing in hams that are new to amateur radio as well as some that may be returning is a goal we should all explore.

I invite all hams or “soon to be” hams to visit with us. We meet the third Tuesday of every month at 7 PM. at the Justice Center, 230 4th St, Springfield, OR 97477. We usually have a presenter talk on a subject of interest to the membership, conduct some business then visit a while and go home. We are a smaller club so you won't get lost in a sea of experts who do little more than make your head hurt and make you keenly aware of what you don't know. You'll find answers to your questions, someone who likely will share a particular interest and will make life long friends in the process.

Our members come from very diverse backgrounds spread across the entire spectrum of the hobby. What we have in common is our love of amateur radio. Their interest is just as diverse, we have some top operators skilled in all modes; others are interested in designing and testing equipment. Some members are learning or reinforcing their CW skills. During the coming year we hope to continue to have informal training sessions on different aspects of the hobby. Won't you consider visiting one of our meetings? You'll be glad you did and so will we.

73,

Doc W7DOK

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## Meetings

By Ken, KG7QPL.

### Looking for an Opportunity to Connect?

EARS has several regular meetings and other chances for you to join in and get connected!

- Monthly Club Meetings: 3rd Tuesday of each month, 7 PM, Springfield Justice Center
  - For a summary of our past meetings and links to some of the presentations, see our [Past Meetings](#) page.
- Weekly Nets: Weekly on Thursdays at 7 PM at 146.74 MHz (EARS repeater)

- Monthly VE sessions: see the VE section of the newsletter for details
- Monthly no-host Breakfast: 1st Saturday of each month, 10 am, Brail's Restaurant in Eugene

Check out the [Calendar](#) page for any changes to the meeting times or locations.

## June 2022 EARS Net Reports (146.74 MHz):

- **6/2/2022, 1900:** Net control: KG7QPL; Check-ins (3): AD7Z, W7CN, KJ7CNJ; Traffic: Reminder that June EARS Breakfast has been moved from 6/4/22 to 6/11/22
- **6/9/2022 1900:** Net control: KG7QPL; Check-ins (9): W7DOK, NK7Z, AD7Z, W7CN, NT7B, K7OWW, KJ7CNJ, KJ7CWV, AI7AD; Traffic: Reminder that June EARS Breakfast is this Saturday, 6/14/22; Encouraging others to come to VE sessions; KJ7CNJ is now using a magmount antenna w/ his HT.
- **6/16/2022 1900:** Net control: KG7QPL; Check-ins (5): NK7Z, AD7Z, W7CN, NT7B, KJ7MQA; Traffic: None.

## June 2022 EARS Breakfast:

We had our best turnout ever for breakfast this month with 8 members in attendance! Between the food and the conversation, a great time was had by all! We hope to see you at the next breakfast on July 2!

## Want to Join the EARS Club?

[Click here](#) to learn how to subscribe to our email list or to obtain a membership application.

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## Volunteer Examiners Report

By Bob, [AD7Z](#), and Peter, N7IY.

### Latest Exam Results:

One of the joys of holding test sessions is seeing the huge grins and feelings of accomplishment from the newly licensed and those who upgraded. I particularly enjoy talking with the candidates to find out what brings them into Ham radio. It is fascinating how radio has become a part of their lives. Our candidates come from all over Oregon and elsewhere, which tells me we are providing a service to a much wider area than just Springfield, and that is rewarding.

The last exam on May 28, 2022, had two candidates attending who took three exams. One candidate passed the Technician, went on to take the General and also passed. The successful General was from Eugene. Our other candidate came in from Roseburg for the Extra exam and passed with flying colors. Seven of our club Volunteer Examiners showed up to administer the exams and we are grateful for their help.

More information on previous exams are listed below.

The April test session resulted in one upgrade to General class and came in from Lebanon, Oregon. Seven Volunteer examiners were present to oversee the testing.

The March test session was attended by two candidates, one from Creswell, one from Marcola. Both were there for the Technician test and both passed. Five volunteer examiners were also there.

February's test session was attended by five candidates and eight volunteer examiners. Four candidates passed the General exam and one passed the Technician test. Two candidates were from Eugene, one from Coos Bay, one from Lebanon, and one from Amity.

The January exam session was attended by four volunteer examiners and three candidates for testing. Two new Technicians and one new General were very happy after the session. Two of our test takers were from Eugene and one from Springfield.

2021:

During 2021 we held only two test sessions due to the Covid pandemic and its restrictions, one in July and one in October. July had eight candidates from Corvallis, Medford, Orting, WA, Salem, and Box Elder, SD. I believe that the candidate from South Dakota was a long haul trucker who was in the area and decided to take his test with us. This session produced seven Technicians and one Extra. Six examiners were there to see the proud results.

The October test session had two candidates who both left as new General class license holders and hailed from Salem and Albany. Four of our volunteer examiners took part in administering the exams.

That's it for this issue.

Last Updated on June 12, 2022 by [Bob , AD7Z Walters](#)

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# Digital

By Howard, WX7HS.

## WSJT-X and FT8: What are they?

Some of you are already using WSJT-X and the various modes such as FT8. For others, you have may heard about FT8 but have never tried it. This month's news on Digital presents an introduction and several on-line resources to help you get you setup and started on FT8.

WSJT-X is a computer program designed to facilitate basic amateur radio communication using very weak signals (it is not a low RF power mode). The first four letters in the program name stand for "Weak Signal communication by K1JT," while the suffix "-X" indicates that WSJT-X started as an extended branch of an earlier program, WSJT, first released in 2001. Bill Somerville, G4WJS, Steve Franke, K9AN, and Nico Palermo, IV3NWX, have been major contributors to development of WSJT-X since 2013, 2015, and 2016, respectively. Joe Taylor/K1JT, who has led software development, is a Nobel laureate and a professor of physics at Princeton University.

The WSJT-X, a free software program, includes several digital communication modes including FST4, FT4, FT8, JT4, JT9, JT65, Q65, MSK144, WSPR, FST4W, and Echo. Of these modes, FT8 and FT4 are the most commonly used and now constitute the majority of DX (long distance) contacts (QSOs) made on HF bands.

FT8 and FT4, in particular, have been very useful in making DX contacts during periods when HF propagation is poor. For many that live in urban areas that limit the kind of antenna that can be installed, FT8 and FT4 have provided the ability to make numerous DX and US QSOs.

The typical FT8 and FT4 QSO exchange is each station's call sign, grid square location (for example, CN84ka), and a signal report expressed in decibels (dB).



Acknowledgement of a completed QSO is usually a “73” plus each station’s call sign. Below is a computer screen shot showing typical FT8 signal decoding.

Band Activity					Rx Frequency				
UTC	dB	DT	Freq	Message	UTC	dB	DT	Freq	Message
133430	17	0.3	2571	- W1FC F5BZB -08	133430	-15	0.3	590	- K1JT HA0DU KN07
133430	15	-0.1	2157	- WM3PEN EA6VQ -09	133430	-15	0.1	1648	- K1JT EA3AGB -15
133430	-3	-0.8	1197	- CQ F5RXL IN94	133430	-17	0.1	2039	- K1JT HA5WA 73
133430	-13	0.3	641	- N1JFU EA6EE R-07					
133430	-9	0.1	723	- A92EE F5PSR -14					
133430	-3	-0.1	2695	- K1BZM EA3GP -09					
133430	-14	0.3	400	- WORSJ EA3BMU RR73					
133430	-15	0.3	590	- K1JT HA0DU KN07					
133430	-7	0.4	2733	- W1DIG SV9CVY -14					
133430	-15	0.1	1648	- K1JT EA3AGB -15					
133430	-13	0.2	2852	- XE2X HA2NP RR73					
133430	-5	0.2	2522	- K1BZM EA3CJ JN01					
133430	-7	-0.1	2546	- WA2FZW DL5AXX RR73					
133430	-11	0.3	2238	- N1API HA6FQ -23					
133430	-2	0.2	466	- N1PJT HB9CQK -10					
133430	-17	0.7	1513	- N1API F2VX 73					
133430	-16	0.2	2606	- CQ DX DL8YHR JO41					
133430	-17	0.1	2039	- K1JT HA5WA 73					
133430	-6	0.4	472	- KD2UGC F6GCP R-23					
133430	-15	0.1	2280	- CQ EA2BFM IN83					
133430	-17	0.5	244	- K1BZM DK8NE -10					

Using any of the modes supported by WSJT-X, has minimum requirements as listed below.

- SSB transceiver and antenna
- Computer running Windows 7 or later, macOS 10.13 or later, or Linux
- 1.5 GHz or faster CPU and 200 MB of available hard drive/SSD storage; faster machines are better
- Monitor with at least 1024 x 780 resolution
- Computer-to-radio interface using a serial port or equivalent USB device for T/R switching, or CAT control, or VOX, as required for your radio-to-computer connections
- Audio input and output devices supported by the operating system and configured for sample rate 48,000 Hz, 16 bits
- Audio or equivalent USB connections between transceiver and computer
- A means for synchronizing the computer clock to UTC within  $\pm 1$  second (accomplished using free software)

Almost all SSB transceivers are compatible with WSJT-X. Most newer transceivers have integrated computer-to-radio interfaces and sound cards which makes setup simpler.

For older transceivers, there are audio devices from Signal Link by TigerTronics and inexpensive USB plug in audio adapters that allow WSJT-X signal decoding. The internet can be your friend in obtaining setup information for your specific transceiver.

WSJT-X integrates with most digital logging software. Everyone has their favorite, but many local FT8 users like ACLog. ACLog is available for a one-time, lifetime cost of \$35.00 and is downloadable at:

<https://n3fjp.com/aclog.html>

If you plan to try FT8 or the other WSJT-X supported digital modes, you should carefully read the user manual which is available on the WSJT-X website. Also, Gary Hinson/ZL2IFB has prepared a detailed user guide that compliments the “official” user document. The links to the WSJT-X website and Gary’s user guide are:

### **WSJT-X Home Page With Links for Software and User Guide Downloads**

<https://www.physics.princeton.edu/pulsar/k1jt/wsjtx.html>

### **WSJT-X User Guide by Gary Hinson/ZL2IFB**

[https://www.g4ifb.com/FT8\\_Hinson\\_tips\\_for\\_HF\\_DXers.pdf](https://www.g4ifb.com/FT8_Hinson_tips_for_HF_DXers.pdf)

WSJT-X digital modes have been fun and has allowed many to have QSOs that would have otherwise been very difficult to make. Be sure to thoroughly read the user guides. In addition to finding radio-specific setup information on the internet, there are EARS members that can help “Elmer” you.

### **Coming Next Month**

In the next newsletter, additional information about using WSJT-X will be published including software add-ons like JT-Alert (<https://hamapps.com/>) which keeps track of worked stations and alerts for stations needed for various awards such as DXCC.

Good DX

73 Howard WX7HS

Last Updated on June 19, 2022 by [Howard Saxion](#)

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## DX & Contesting

By Dave, [NK7Z](#).

### Propagation, part I

#### *“The Ionosphere”*

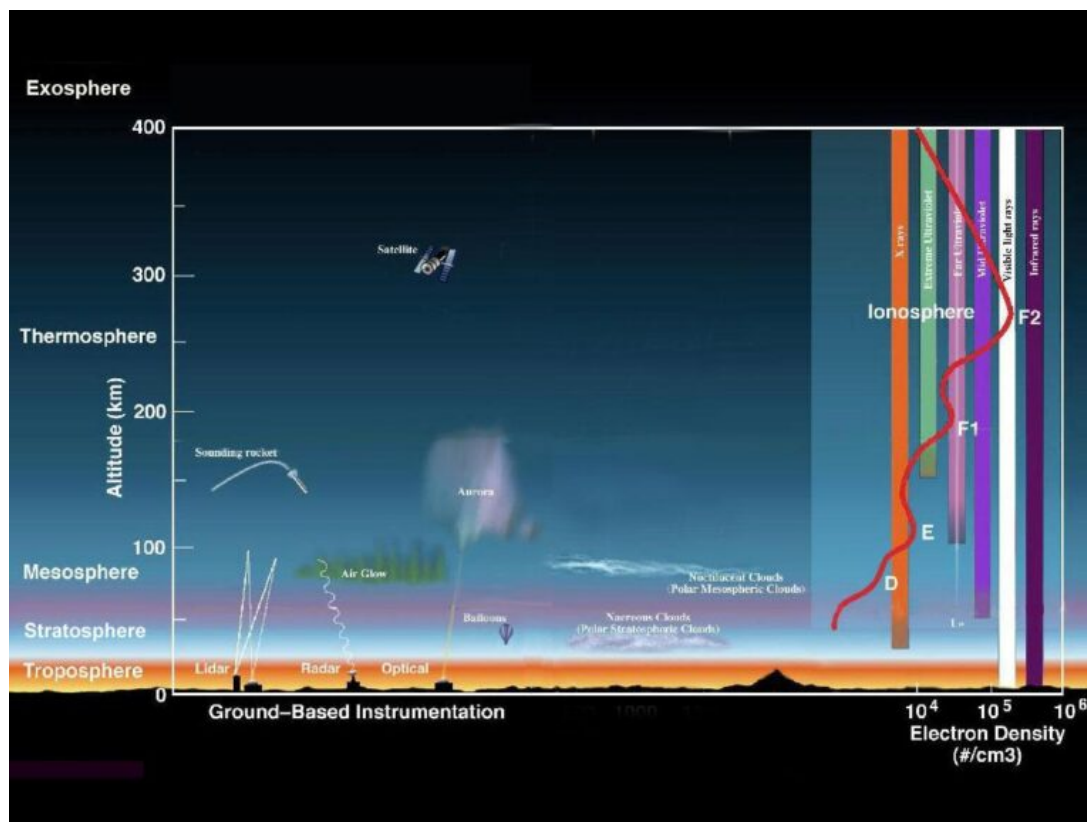
##### Overview

This is the first in a multi part set of articles that will help you understand how to work more DX by understand band openings, and band closings. In order to work more DX you will need to understand what bands are open, when they are open or closed, and, if they are open, where they are open to. That said, let's get started. In this first article, atmospheric, and ionospheric structure will be covered. That will give you the basis for

understanding how, and why, DX comes about. What you learn today, will be useful tomorrow, and in understand the rest of this series. Throughout this series of articles, you will see links to other articles, and web pages. These links are to assist you in learning more if you want. You do not need to follow these links to understand what this series of articles is trying to teach.

## What is the Ionosphere?

In order to understand propagation one needs to understand how the Ionosphere works, no small undertaking! In order to understand how the ionosphere works, you will need to understand the structure of the Earth's atmosphere first. The atmosphere is a pool of gaseous components held close to the Earth's surface by gravity.



*Atmospheric/Ionospheric layering*

The atmosphere is broken down into several layers, each with a soft start, and a soft stop altitude. This means that there is no distinct layering, but that one layer blends into the other. Looking at the image on the left, you will see a set of

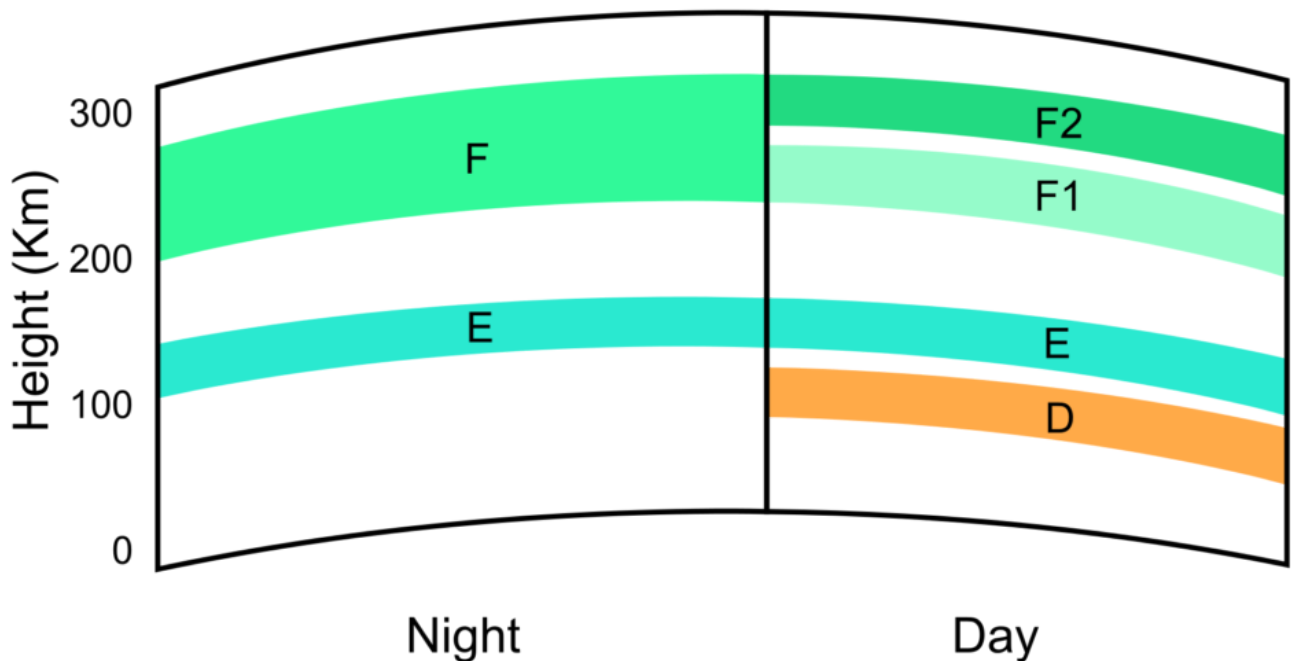
colored vertical bars. Each bar represents one layer of the Ionosphere. The top and

bottom of the vertical bars represent the altitudes where that layer starts and ends. The entire right bar is not to scale, and it fits between the Mesosphere, and the Exosphere. The red curvy line indicates electron density, something we won't cover for a few installments. The ionospheric shell consists of electrically charged atoms, molecules, and electrons. They can be either positive, or negatively charged. The important thing to remember is they are not neutral, if they are not neutral, then they are ionized. All of this is also within the Earth's atmosphere, between the Mesosphere, and the Exosphere.



## **The Ionospheric Shell**

The ionospheric shell, (living between the Mesosphere and teh Exosphere), consists of a number of layers just like the atmosphere does. Each layer is named. The names are as follows; D, E, F1, and F2. Not all layers are present at all times. Layers are dynamically created, and destroyed, based on the external stimuli reaching them. Sometimes a layer is thicker, sometimes it is thinner, it all depends on the Sun. Here is a diagram showing the rough day and night layer positions of the ionosphere.



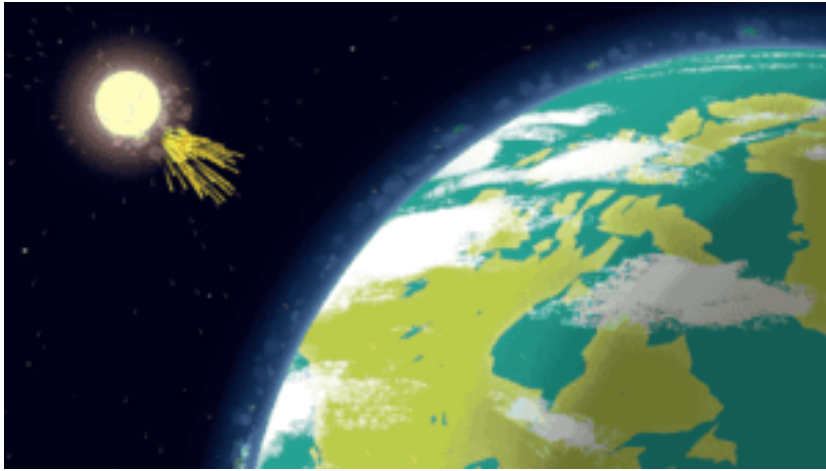
*Day and night Ionospheric layering*

Note that the day and night sides are very different. During the day, the sun is bombarding the ionosphere with X-Rays, Ultraviolet light rays, and in general all sorts of short wavelength, high energy photons. The ionosphere is primarily created when Ultraviolet, (or UV radiation) strikes the upper atmosphere.

Why do we care about all of this? Because the ionosphere is responsible for most, if not all, radio propagation beyond the horizon, and propagation beyond the horizon is called DX, and that's what we want, more DX!



**Why call it the ionosphere?**



*The sun provides the high energy events for ionization to take place.*

Well– it's close to a sphere in shape, (it surrounds the almost round Earth), and things get ionized in it, so you have a sphere of ionization, or an ionosphere! But what does ionized really mean, and why do we care about it? When an atom loses, or gains a charge unit, (the atom, or molecule becomes more, or less, negative, or more,

or less positive), it becomes ionized, that is to say the atom has an charge of some type, positive, or negative, but not zero, or neutral. When a radio wave hits an ionized cloud of atoms or molecules, or even a loose cloud of electrons, that radio wave can be bent. That bending is called refraction. Refraction is what causes all DX.



## Refraction

Your signal is refracted over the horizon hopefully to places far away. UV light, X-Rays, and other shortwave, high energy events, can, and do dislodge electrons from neutral gas atoms, or molecules, when absorbed. This can create a large number of ionized particles, forming an ionized cloud, which can refract radio waves. So your DX is intimately connected to the count of ionized particles in the ionosphere. For the most part, more ionization is better, less ionization is worse for where DX is concerned. Ionization, and hence your DX, is also intimately connected to the current state of the Sun. So as the Sun excites the upper atmosphere, ionized clouds are formed and dissapate depending on the levels of high energy radiation the sun is providing, or not providing. So your DX is tied very directly to the current state of the atmosphere, and



*Signals being refracted by ionosphere.*

hence to the state of the Sun. What have we learned in this session?



## Conclusion

DX is tied very directly to the state of the ionosphere, which in turn is tied to the higher energy output items the Sun produces. That output from the Sun then modulates the ionization state of the ionosphere, (higher, or lower), and hence how well, (or if at all), our signals are refracted across the planet. The higher the energy being deposited into the upper atmosphere, the better DX is.

## Next Month

Next month we will look at the Sun, and what actions it can take to affect the ionosphere, and hence your DX.



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## Thank you!

...for taking the time to read our newsletter. For more information on EARS, [click this link](#). We hope you have enjoyed your stay with us, and please check this page often, it is updated in real-time, and articles, can come and go at a moments notice...

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