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**AES** Audio Engineering Society - Pacific Northwest Section

*Around the Puget Sound, Seattle, Washington, U.S.A.*

**October Meeting Notice**  
**Analog Tape Playback Without Wow and Flutter**  
**Presented by**  
**Jamie Howarth and John Chester**  
**Plangent Processes Inc.**  
**and the**  
**AES PNW Section**  
**ZOOM MEETING 6:00PM PDT (UTC -7)**  
**Monday, October 18th, 2021**

Every analog magnetic recording starts with a motor dragging a rusty strip of plastic over rollers and guides, across scraping metal parts. Unfortunately, every inconsistency in the speed of the tape as it traces this obstacle course distorts the music being recorded. The transport's various imperfections create an ever-changing matrix of speed variations, slow or fast, subtle or severe.

At worst, this results in the familiar warps and warbles known as 'wow' and 'flutter.' It can even (as in the famous case of Miles Davis' "Kind of Blue") cause a perceptible tuning change over time.

Even the very best analog recordings - wherein the obvious wow and flutter are fairly well under control — are nevertheless affected by varying and shifting patterns of high frequency flutter, causing random beat frequencies to be introduced which seriously interfere with the natural harmonic structure of the musical material.

Until recently, there was no way to eliminate these defects and to regain the neutrality and transparency originally in the mix at the console output. With Plangent's unique combination of a wideband low-noise repro capture system and forward-thinking DSP it is possible to correct these artifacts.

## **What is Plangent?**

The Plangent Process Playback System is a hybrid hardware/software package combining state of the art contemporary analog electronics coupled with unique digital signal processing.

It begins with an ultra-wideband low-distortion custom reproduce head and subsequent associated hand-wired preamp, followed by proprietary DSP that provides total speed stabilization and wow and flutter correction. This unique combination of integrated hardware and post-processing provides the archival mastering and preservation community a level of playback quality never before possible.

Join Jamie Howarth, President of Plangent Processes, and John Chester, Chief Transfer Engineer, as they take us through the invention and process of Plangent, with many examples of how it works.

They will show us an actual tape on an actual tape machine (remember those?) and show us the Plangent hardware capturing audio and bias. They will describe a simple case of the digital post-processing doing its thing, but some details are proprietary and won't be discussed.

The difference between the unprocessed music and a Plangent-processed version of the same music can be quite dramatic, and we'll hear examples of each.

The presentation is on Zoom (free registration through Eventbrite required to get the Zoom link; see below), and non-Members are always welcome.

## About Our Presenters

**Jamie Howarth** Jamie Howarth is musician, composer and audio inventor who resides on Nantucket, MA. Veteran engineer and director at various media facilities including the Hit Factory and a 20 year run at ABC TV as an audio post-production engineer and music director.

Howarth's audio restoration company, Plangent Processes has earned 2 Best Historical Album Grammy wins for The Rolling Stones' "Charley is My Darling" and "The Live Wire - a 1949 live performance by Woody Guthrie, and a 3rd nomination for Errol Garner's "Concert By The Sea". Plangent Processes has restored numerous master tapes for Bruce Springsteen, Queen, Grateful Dead, the Neil Young Archives, Doc Watson, Tim Buckley, Pete Seeger, and the Andy Warhol estate, The Owsley Foundation, among others. A mag film version of Plangent has aided soundtrack restoration for From Here to Eternity, Close Encounters of the Third Kind, Cabaret, Camelot and West Side Story among many others.

### John Chester

- Live sound engineer (Chief Sound Engineer, Fillmore East, 1969-1971)
- Analog circuit designer and equipment manufacturer (Chaos Audio, 1971-1990; Modulation Sciences, Vice President R&D, 1980-1992).
- Independent consultant for A/V, video conferencing, network and telecommunications, 1992-2002.

In 2002 John began repairing and upgrading tape machines. After refreshing his memory of magnetic recording theory, he then started on all the theory he'd never learned. John then learned how to use modern digital tools to improve the performance of vintage machines.

In 2007 he met Jamie Howarth, learned about Plangent technology, and began the design and construction of the next generation of Plangent hardware. He began doing Plangent transfers in his studio. For formats larger than 1/2", he set up Plangent equipment in a studio that had the appropriate tape machine and then supervised the transfer (e.g. Grateful Dead Europe 72 multitrack, done at Sonicraft). The Plangent equipment and techniques continue to evolve.

## Additional information

These papers are available from the AES.org website. You must be a member to view them.

### **2004 AES Convention:**

[Nonuniform Sampling Theory in Audio Signal Processing](#)  
[Correction of Wow and Flutter Effects in Analog Tape Transfers](#)

### **2018 AES Conference on archiving:**

[An Overview of Advances in Magnetic Playback](#)

[Company Website](#)

**THIS EVENT IS FREE, OPEN TO ALL, AND AES MEMBERSHIP IS NOT REQUIRED**

[Eventbrite link](#)

## **Fall in-person convention, Las Vegas**

The October in-person event, co-located with the NAB Show in Las Vegas has been cancelled (11-13 October 2021) due to the evolving realities of the COVID pandemic. Although the in-person event is no longer, your Society is moving ahead with an online event, 16-31 October, including a broadly focused technical program, 20-23 October 2021. Please visit [aesshow.com/fall2021/](https://aesshow.com/fall2021/) for updates and registration.

## **PNW AES Zoom Meetings**

We started holding our meetings via Zoom beginning with the April 2020 meeting. Zoom has dramatically increased our reach, well beyond our Section's geographic area. Since doing this, we've had attendees from Canada, and as far away as Indonesia, and Australia. Zoom gives the ability to record our meetings, and those recordings will be posted in our past meetings Archive. For now, video from our Zoom meetings can be found (mostly) at Dan Mortensen's [YouTube channel](#).

We use EventBrite to manage our free tickets to meetings. You need to RSVP for yours via the following link. The Zoom URL will appear on the virtual ticket for the event. Copy it down!

[Eventbrite link](#)

When you register at EventBrite and when you enter the Zoom meeting, please use your real first and last names so we can get to know each other. You do NOT need to create an EventBrite account to register.

## **Please Note**

In order to maintain decorum and avoid interruptions, even unintended ones, we have established a few ground rules for meeting attendees:

1. We want to see your full name on display in Zoom at the meeting.
2. All audience audio and video will be muted for the duration of the event.
3. The presenter will determine if they can accept questions during the presentation, or wait until specific Q&A times, and that will be announced at the beginning of the meeting. (We often use the "chat" feature to allow attendees to ask questions when they think of them, with moderators passing them on to the presenter at the appropriate time.)

4. Based on our experience with no-shows, we reserve the right to issue more tickets than available slots. We don't want to turn people away based on inaccurate estimates of attendance, but we do have budgetary limits to the number of slots we can make available. If we reach capacity before you log in, we regret that we have no way to expand capacity at the last minute.
5. It would be good if you watched the chat stream during the meeting. Not only is it a way to submit questions to the presenters, but it's also a way for others to contact you personally. You have the option there to direct your comment to anyone who is part of the meeting as well as to one person in particular.

**Finally, in the rare instance of behavior by an attendee that moderators believe is disruptive, we reserve the right to immediately eject such attendees.**

## **Greg Dixon**

*AES PNW 2021-2022 Section Chair*

***n.b.** The material presented at our meetings is the opinion of the presenter and not necessarily that of the Society. You are encouraged to conduct your own research and to form your own opinions before adopting the presented material as Truth.*

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