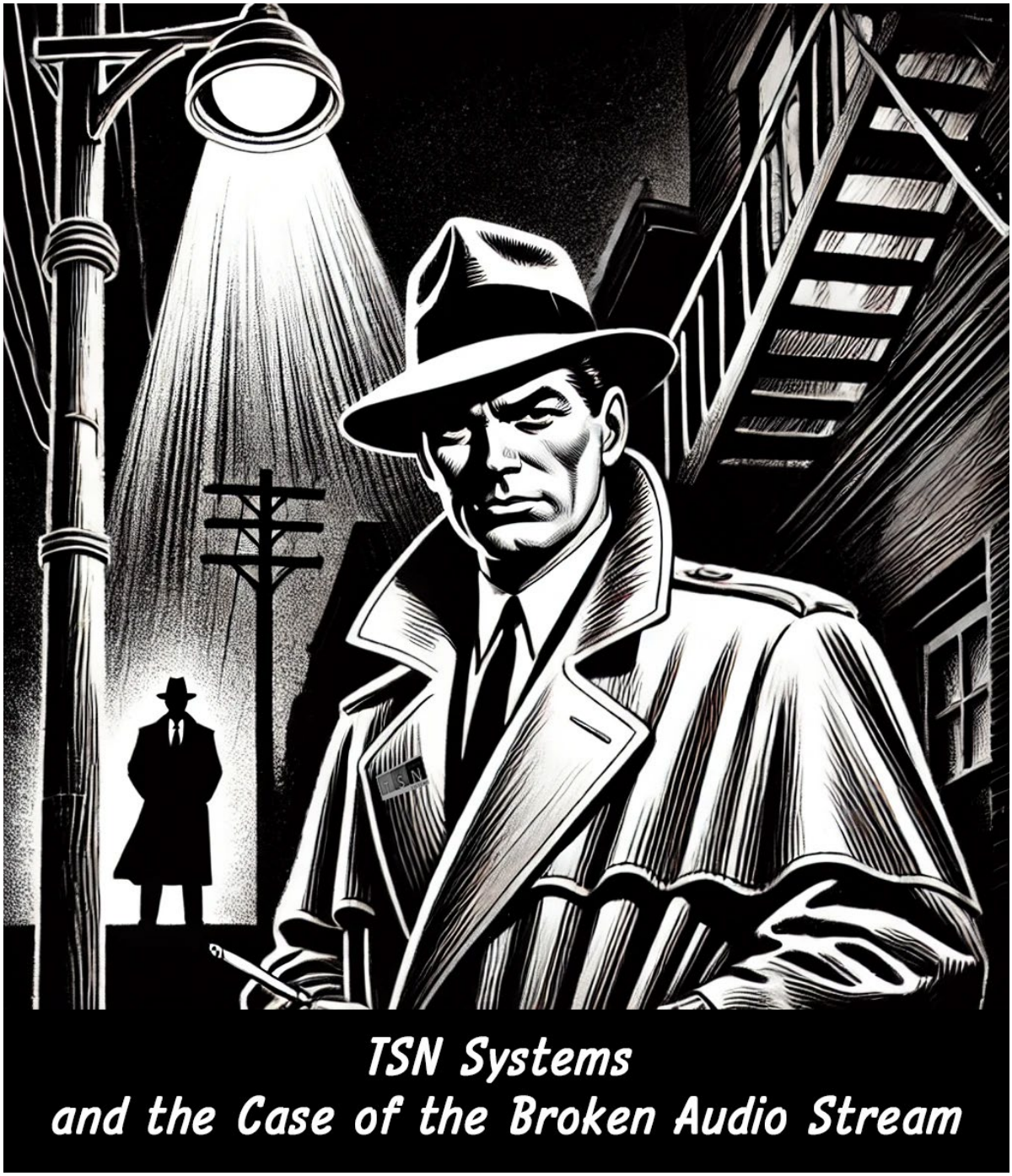


"Dark TSN Secrets: A Sinister Game of Deception and Misleadingness!
In the shadowy underworld of Networks, one group of specialists uncover a web of faults, wrong settings, and deadly assumptions. Will the standards prevail, or will the darkness consume them? Don't miss this heart-pounding tale of thrilling facts, and revelations! This Story is Based on Actual Events!"

Not Suitable for Children, Pregnant Women and Those with Weak Hearts Should Avoid!

(C) By Robby Gurdan 2024

TSN SYSTEMS

TSN Systems and the Case of the Broken Stream:

It was a cold, grey morning when the call came in—a high-stakes case threatening the launch of a new vehicle, and time was ticking. The issue? A mysterious series of audio dropouts in an automotive infotainment system.

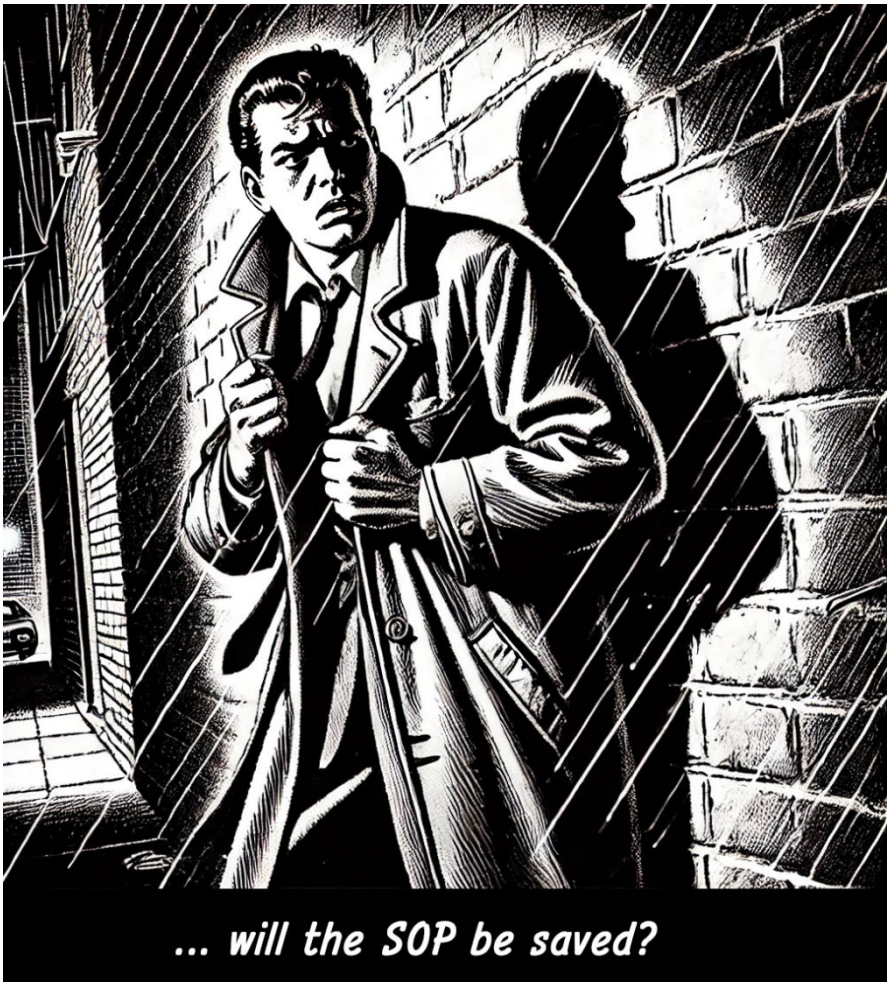
A head unit and an amplifier, two prime suspects supplied by different Tier1s, were supposed to work together in harmony.

But instead, within minutes of connecting, the sound cut out like a bad radio signal on a stormy night. The OEM was desperate, the SOP deadline looming like a guillotine over the project.

They'd run their diagnostics, and both devices had passed with flying colors.

Each performed flawlessly on its own, but the moment they came together, chaos ensued.

The OEM's measurements showed nothing out of line.



Both Tier 1 suppliers were adamant: their gear wasn't the problem.

So why did the system fall apart every time they tried to make beautiful music?

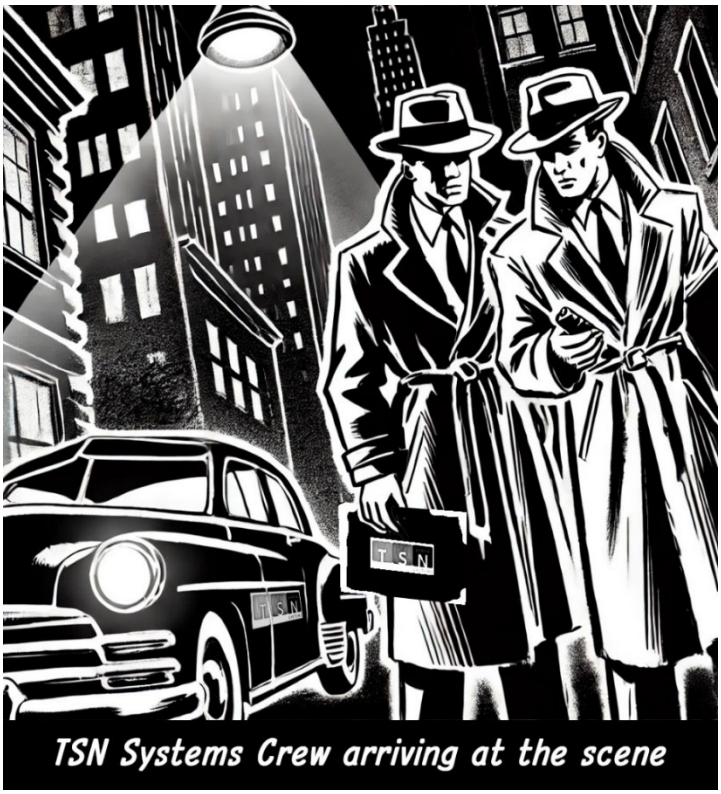
That's when they called us....

First Impressions:

We arrived on the scene and took a hard look at the evidence. The amplifier was the first to catch our eye. It had all the signs of being in distress ...data underruns, audio was dropping off like a whisper in the wind.

We combed through its logs, and there it was - the telltale sign of instability: the media clock in the 1722 stream was erratic, jittery, unstable. But here's where it got interesting. When we swapped out the head unit for our own TSN Core solution, the amplifier was suddenly singing a different tune. Perfect sync, no dropouts. Smooth as jazz on a Saturday night.

The same thing happened when we examined the head unit in isolation.

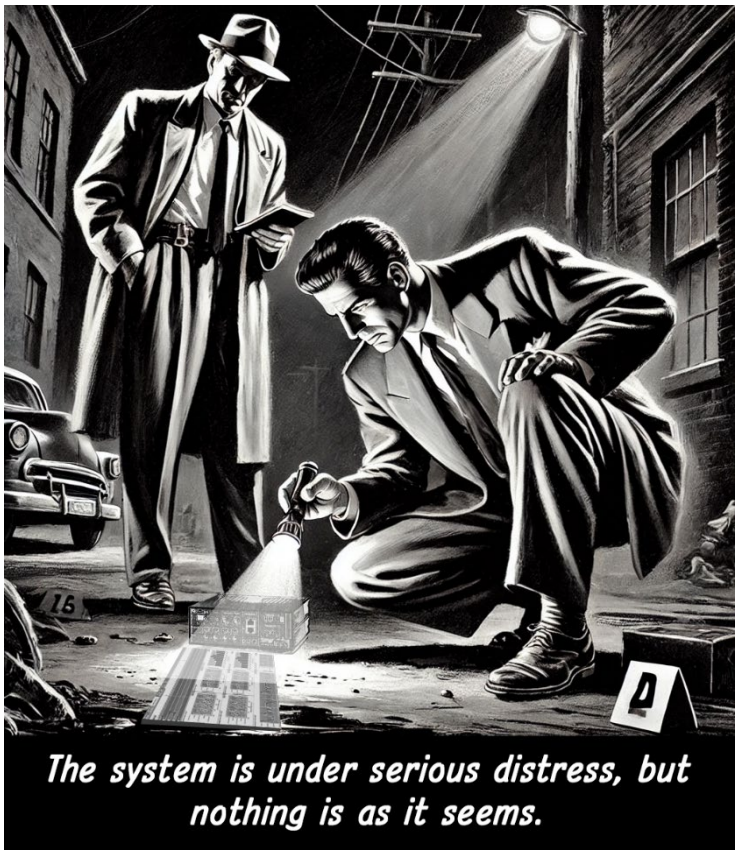


TSN Systems Crew arriving at the scene

During its own single device test, connected to a gPTP Grandmaster device, the head unit performed flawlessly. No jitter, no dropouts. The 1722 stream was steady as a rock. The CRF stream, the synchronization clock the amplifier needed, was solid. So why, when these two devices worked together, did everything go wrong?

The Test:

We set up our equipment and tapped into the data traffic between the two devices. Every packet, every bit of timing information we captured it all. Our TSN Core solution gave us a front-row seat to the show, correlating PTP timing and media clock data between the head unit and the amplifier. It was a digital autopsy, and soon, the real story started to unfold.


The system is under serious distress, but nothing is as it seems.

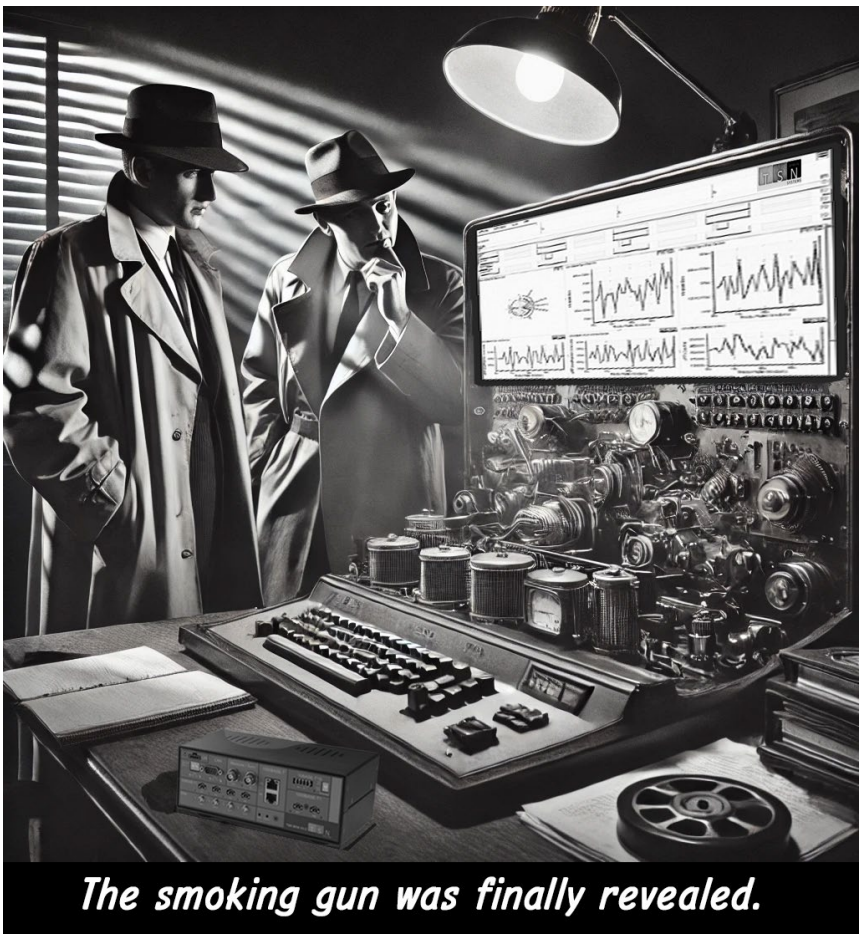
The Analysis:

Both devices had aced their individual tests, but once we dug deeper, the cracks began to show. We confirmed what the amplifier's logs had hinted at - the head unit's media clock was all over the place. It wasn't just jittering; it was wandering like a lost soul, drifting out of sync and snapping back after a few seconds. It was like watching someone stumble, catch themselves, and then trip all over again.

We replaced the amplifier with our TSN Core solution and nudged the media clock frequency—just a little up, just a little down.

Every time we did, the head unit's stream mirrored the same jittery behavior. The further the clocks drifted apart, the worse the jitter became.

The head unit was clearly having trouble handling the frequency offset between its media clock and the grandmaster clock, and the more they differed, the more the system crumbled.



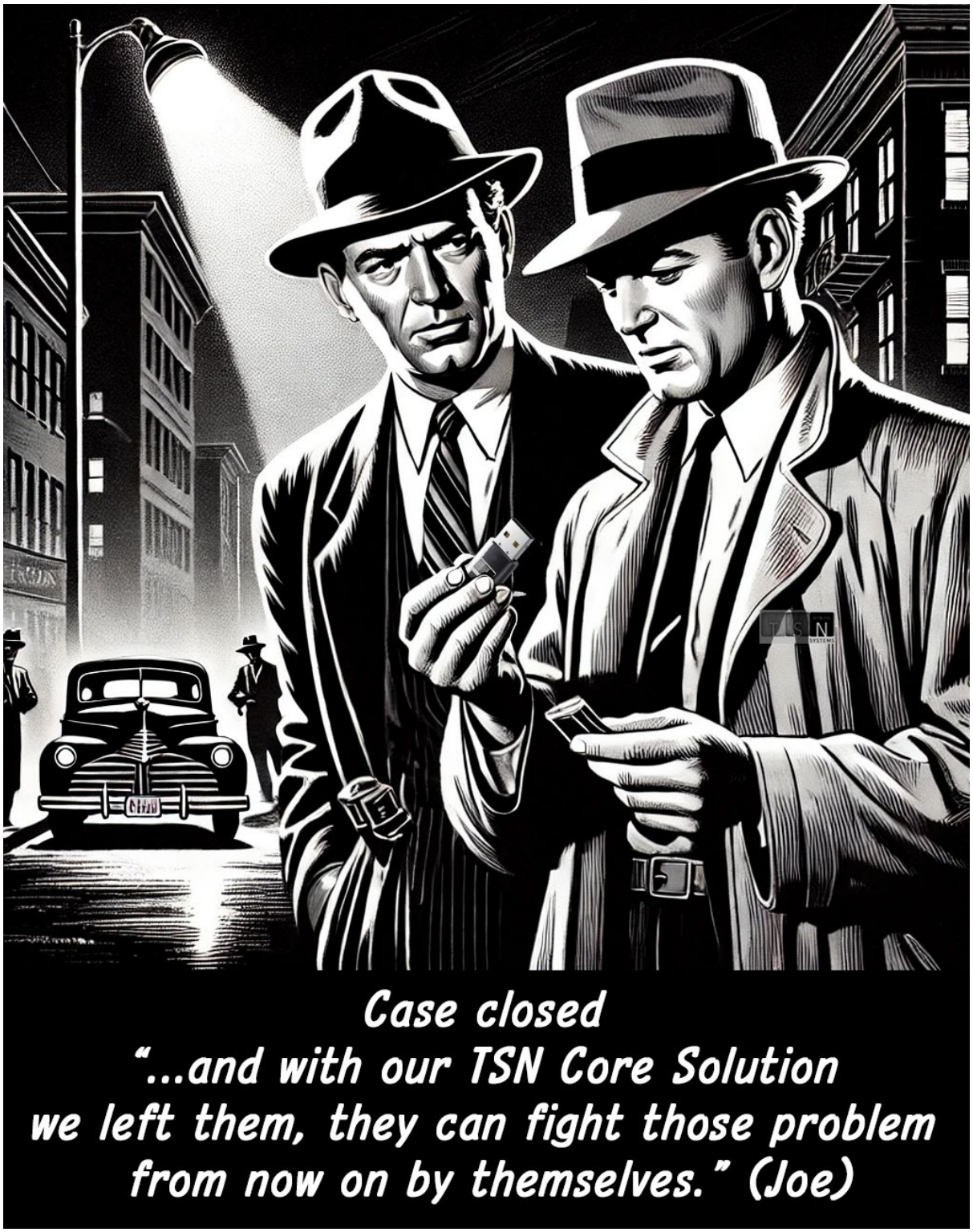
The Conclusion:

The smoking gun was finally revealed.

The head unit wasn't properly using the media clock provided by the CRF stream.

Instead, it was trying to synthesize its own clock, adjusting the frequency every few seconds to compensate for CPU performance issues. This constant correction caused the media clock frequency to fluctuate, resulting in abrupt adjustments that sent jitter rippling through the system. The media clock recovery process couldn't keep up - it either dropped samples or shut down the audio altogether.

In the device tests, this issue had been masked. Both the media clock and PTP clock had been generated by the same source, which kept everything perfectly in sync. But in the real system, where the clocks were slightly out of tune, the head unit couldn't cope.

The verdict? The amplifier was innocent!

The head unit, with its erratic clock synchronization, was the real culprit. We fixed the problem, and the vehicle's SOP was saved - just in time. Case closed.