Why from Carson Cruise to Approach, the progress in the display is slow paced, but from Approach to Stall, the progression is quite fast in Chevron presentation?

This is **intentional design logic** referred to as **Adaptive Sensitivity Scaling**

It's a classic case of "perception vs. physics." What you are experiencing isn't a lag in Absolute AoA system—it's actually the system providing **increased sensitivity** exactly where a pilot needs it most: the slow-flight regime.

The "issue" arises because the Absolute AoA tracks **Angle of Attack (AoA)**, but pilots often mentally correlate it with **Indicated Airspeed (IAS)**. Because the **relationship between Airspeed and AoA is non-linear**, the "speed" at which segments light up will increase as the aircraft slows down.

The Absolute AoA system measures the wing's angle relative to the oncoming air, not just forward airspeed. As an aircraft slows down, the change in Angle of Attack (AoA) required maintaining lift increases exponentially.

To provide the pilot with maximum precision where it matters most—**near the stall**—the system allocates more visual "real estate" (segments) to a smaller range of knots.

The Core Concept: AoA Sensitivity

The Absolute AoA system is designed to provide higher resolution as the aircraft approaches a stall. By representing a narrow speed range (Approach to Stall) with a significant number of segments, the system becomes more "sensitive."

- **At High Speeds (Most Economical Cruise or Carson Cruise):** Each segment represents a large "bucket" of airspeed. You have to lose a lot of knots to see the display segments move.
- **At Low Speeds (Approach to Stall):** Each segment represents a very small "bucket" of airspeed. A slight reduction in speed results in immediate visual feedback.

Comparative Analysis: C172 Skyhawk vs. C441 Conquest

The phenomenon is more pronounced in aircraft with a narrower "slow flight" speed margin, like the Cessna 172.

1. Cessna 172: High Sensitivity Gap

In the C172, the system is **more than twice as sensitive** during the approach phase as it is during cruise.

Flight Phase Range	Airspeed Delta	Display Segments	KIAS per Segment
Carson Cruise to Approach	35 KIAS	8 Segments	**4.38 KIAS**
Approach to Stall	12 KIAS	6 Segments	**2.00 KIAS**

The Result: The pilot sees a new segment light up for every 2 knots lost near the stall, making the display feel "fast" or "jumpy."

2. Cessna 441: Moderate Sensitivity Gap

In the C441, the difference in sensitivity is less dramatic, which is why users find it more "linear" or "natural."

Flight Phase Range	Airspeed Delta	Display Segments	KIAS per Segment
Carson Cruise to Approach	49 KIAS	8 Segments	**6.13 KIAS**
Approach to Stall	27 KIAS	6 Segments	**4.50 KIAS**

The Result: While the approach phase is still more sensitive, the "jump" from 6 KIAS/segment to 4.5 KIAS/segment is less jarring to the eye.

Why the Chevron AoA Presentation in C172 feels "Faster":

In a C172, the system is **over 200% more sensitive** during the approach-to-stall phase than in cruise-to-approach phase. In the C441, the sensitivity increase is more gradual (approx. 136%), leading to a more "linear" feel for the pilot.

Why This is a Feature, Not a Bug

The Pilot's Advantage: "Visual Magnification"

Think of the display as a **magnifying glass** for your flight envelope:

- **In Cruise:** The "zoom" is low. You don't need granular AoA data while leveled off at cruise speed.
- **On Approach:** The system "zooms in." Because each segment represents only ~2 knots (in a C172), you receive immediate, high-resolution feedback on your angle of attack value.

    Summary: The "fast" progression near the stall is a high-fidelity warning system. It ensures that even a tiny 2-knot loss in airspeed is visually telegraphed to the pilot via a segment change, providing a superior safety margin when you are closest to the ground and on the edge of the flight envelope compared to a purely linear display.

Pilot's Note: Think of the display like a magnifying glass. As you get slower, the system "zooms in" on your AoA, giving you more information about how close you are to the critical angle of attack.