Overview of Part 36 Aircraft Noise Certification Stages

"Everything you ever wanted to know about Part 36 'stage' classification but were afraid to ask."

Presentation to:

LAX / Community Noise Roundtable

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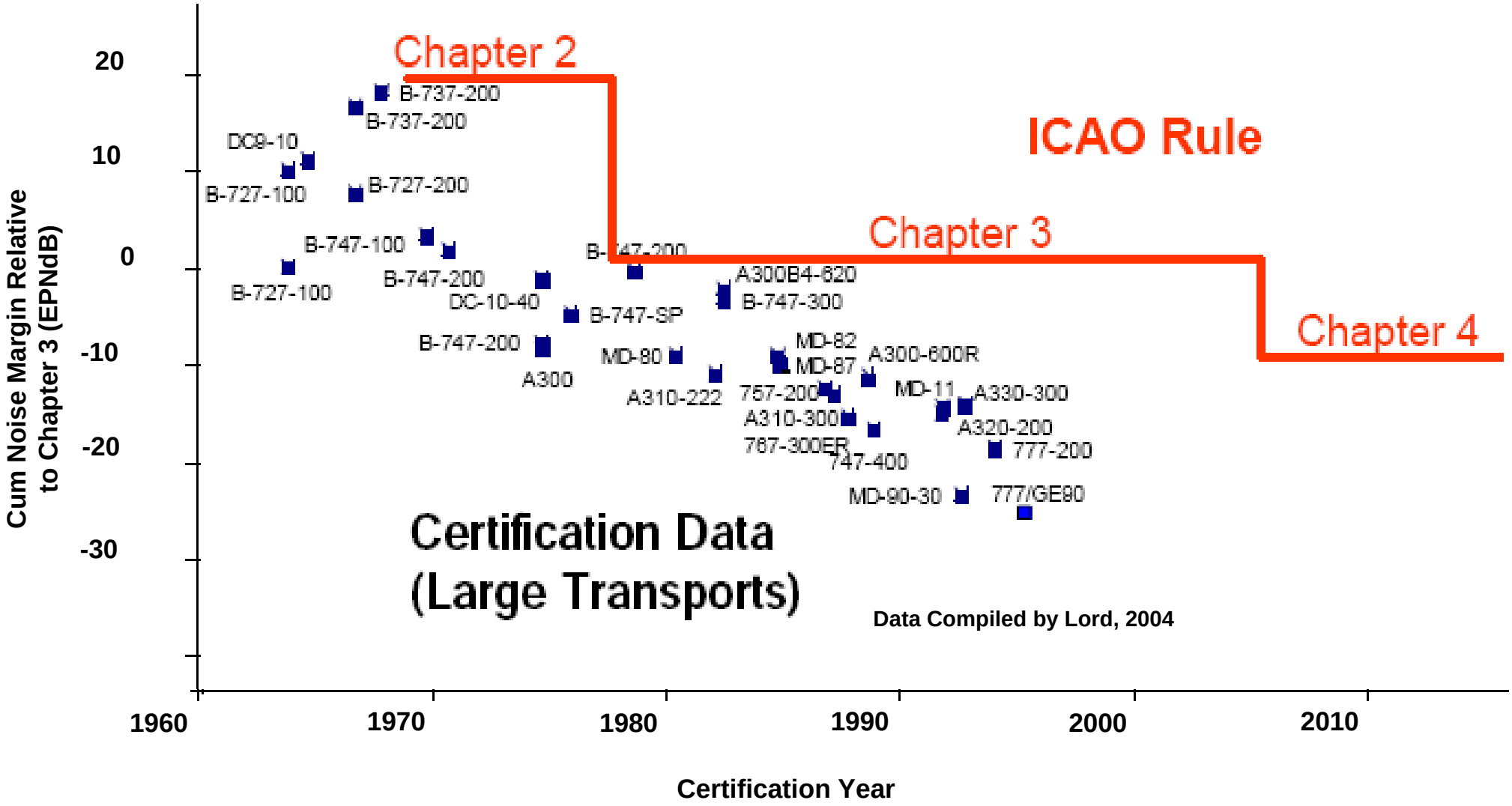
Picking up where Gene Reindel left off in March…



14 CFR Part 36 “Noise Standards: Aircraft Type and Airworthiness Certification”

- **Airplanes must meet Part 36 standards to receive new or revised "type" or “airworthiness” certificates to operate in the U.S.**
- **Noise standards for most aircraft are defined in terms of “stages.”**
- **Standards vary with “design” criteria, including (but not limited to):**
  - Subsonic versus supersonic speed capabilities
  - Type of propulsion (e.g. turbojet- or propeller-driven)
  - Weight (e.g., “small” aircraft under 12,500 pounds, and “large” aircraft
  - Rotary-winged versus fixed-wing aircraft
  - Operating category (e.g., “acrobatic,” “agricultural,” “commuter,” “normal,” “restricted,” “transport,” and ”utility”)
  - Use (e.g., “fire fighting” or “carrying external loads”)
  - Date of initial flight or of application for type certificate
- ***The meaning of stage terms; (e.g., Stage 1” or “2”) varies with these criteria, so references to specific stages should be made with care.***

Why should we care about “stage” terminology?

- **Understanding the applicability of existing regulations**
- **Anticipating the effect of new regulations**
- **Reviewing and commenting on proposed regulations**
  - and other reasons…
- ***A short quiz should help demonstrate why we care…***

Pop Quiz!

- **How is a jet classified as Stage 1?**
  - *By failing testing to meet Stage 2, 3, or 4 standards*
  - *Or … by never having been tested!*
- **The FAA phased out Stage 1 jets in the mid-1980s. *Wouldn't a phase out of Stage 1 small propeller aircraft be an equitable thing to do for people living close in to small general aviation airports?***
  - *No, it would be meaningless, because there is no such thing as a "Stage 1" small propeller aircraft!*
- **The Airport Noise and Capacity Act of 1990 ("ANCA") directed FAA to phase out Stage 2 aircraft by 2000. *How significant was the effect on general aviation jets?***
  - *Nearly non-existent, because the phase out only applied to aircraft over 75,000 pounds.*

Pop Quiz, continued…

- **What is the minimum stage for a DC-9 in the U.S.?**
  - *Stage 1, because some DC-9s are under 75,000 pounds!*
- **What would you think about the reasonableness of a national ban on Stage 1 and 2 helicopters?**
  - *It would be unreasonable, because Stage 2 helicopters meet the highest applicable noise standards!*
- **How did stages become so ambiguous?**
  - Because Part 36 – and the term "stage" – evolved and became more complex over time.
- ***A word or two of caution:***
  - Because of the complexity of Part 36, this presentation is only a high-level summary and ignores many details, special cases, etc.

Evolution of Stage Terminology – 1969 to 1977

- **1969: Established initial Part 36 standards**
  - Only applied to jets and transport-category large props
  - Aircraft were certificated or uncertificated – no stages
  - Set EPNdB limits for takeoff, sideline, and approach
- **1974: Extended Part 36 to propeller-driven small aircraft**
  - "Certificated" or "uncertificated" – stages hadn't been invented
  - Set dBA limits for maximum-power level flyover at 1,000'
- **1977: Increased stringency of limits for jets and transport-category large aircraft *and introduced stages***
  - "Stage 1" aircraft have never been shown to meet any noise .standards (in one of two ways …)
  - "Stage 2" aircraft meet original noise limits, set in 1969
  - "Stage 3" aircraft meet more stringent limits, established in 1977

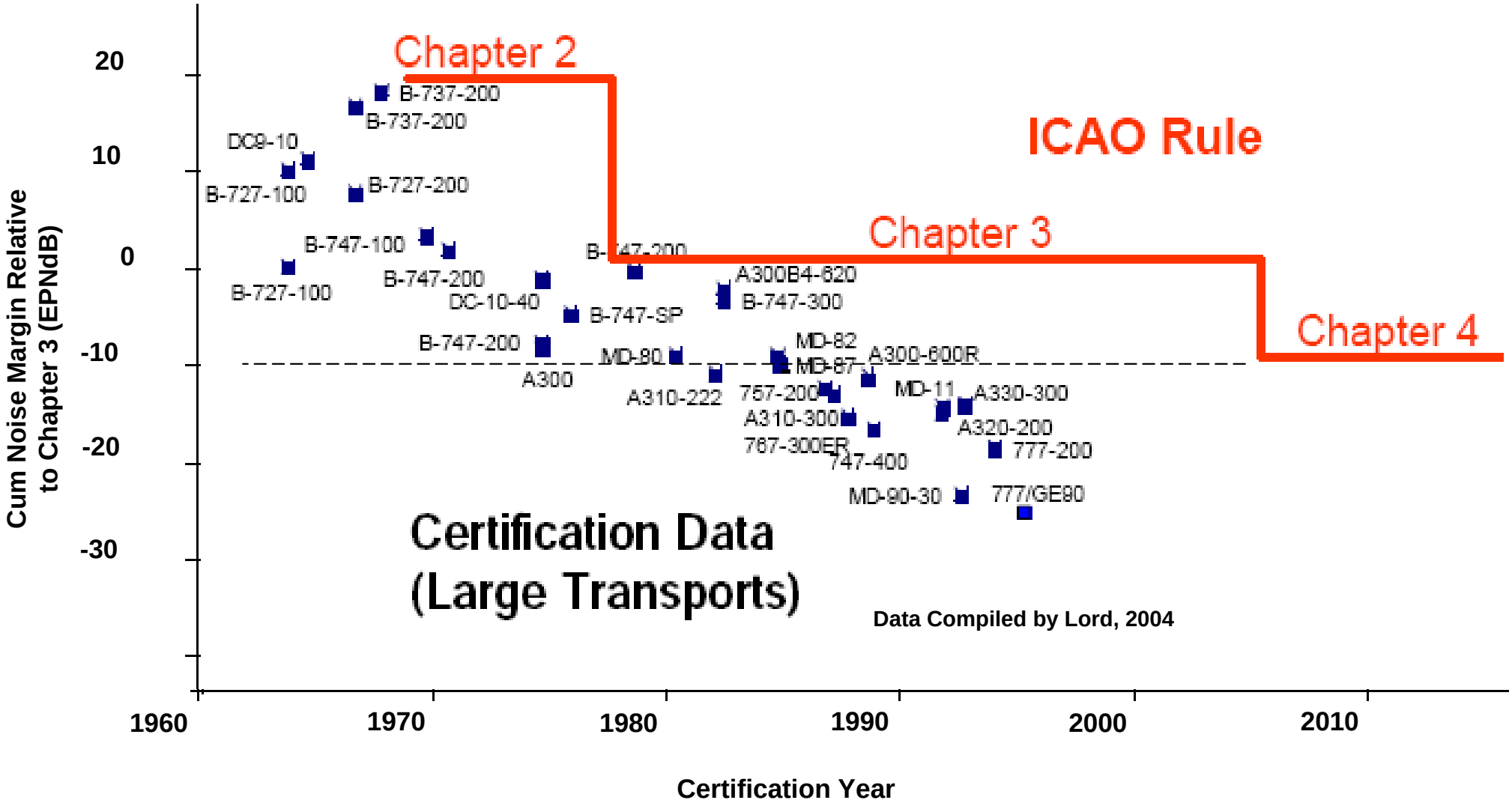
Evolution of Stage Terminology – 1978 to today

- **1978: Extended Part 36 to civil supersonic aircraft**
  - Same standards as civil subsonic jets
  - Concordes with flight time before 1980 (16) exempted
- **1988: Introduced helicopter certification**
  - Two classes, like small props, but termed Stage 1 and 2 (rather than uncertificated and certificated)
  - Stage 2 helicopters are “quiet” helicopters!
  - EPNdB limits for takeoff, approach, like jets and large transport-category aircraft (but not sideline), and flyover, like small props
- **2005: Added of Stage 4 (effective 1/1/2006)**
  - Cumulative 10 EPNdB less than Stage 3 limits
  - Subsonic jet and transport-category large airplanes
  - Not a Stage 3 phase out!

Some Upcoming Issues May Involve Stages

- Phase out of Stage 1 and 2 corporate jets in House version of the FAA reauthorization
- Burbank, LAX, VNY, and other (?) Part 161 studies
- Likely pressure over time for a phase out of Stage 3 jets
- Introduction of new engine technology, such as geared turbofan (Stage 5?)

Remember: *Many existing airliners are Stage 4!*



Any questions?