

Slide 1



Overview of the
ARINC 818
Standard and
Protocol

Prerequisites: None

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Tim Keller
Director of Marketing

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2020

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Great River Technology

GRT is the global leader in ARINC 818

- Development Tools
- Test & Simulation Systems
- Embedded Hardware
- Architectural Building Blocks
- IP

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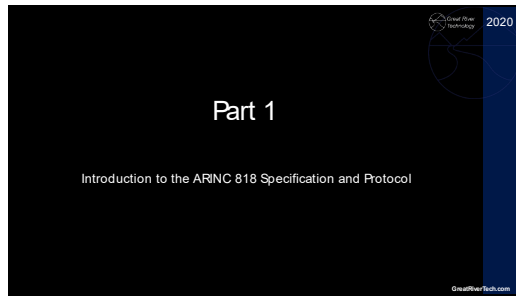
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Agenda

- Part 1: Introduction to the ARINC 818 Specification and Protocol
- Part 2: A/DVB Frame & Container Structure
- Part 3: Synchronization Classes & Latency

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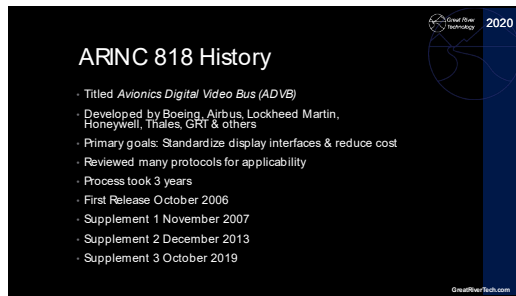
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Part 1

Introduction to the ARINC 818 Specification and Protocol

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ARINC 818 History

- Titled *Avionics Digital Video Bus (ADVB)*
- Developed by Boeing, Airbus, Lockheed Martin, Honeywell, Thales, GRI & others
- Primary goals: Standardize display interfaces & reduce cost
- Reviewed many protocols for applicability
- Process took 3 years
- First Release October 2006
- Supplement 1 November 2007
- Supplement 2 December 2013
- Supplement 3 October 2019

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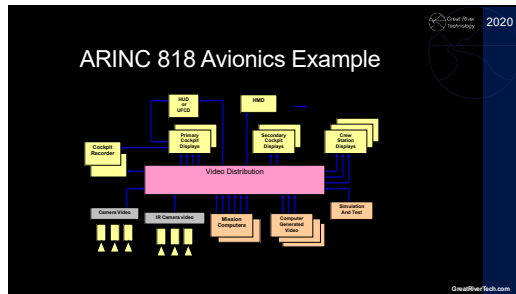
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ARINC 818 Features

- High speed serial link (1G up to 28G)
- Low latency & overhead
- High reliability w/ two layers of error checking available
- Networking capable
- Multiple video streams on a single link
- Extreme flexibility (rates, video formats, data)
- Multiple "timing" classes defined
- Suitable for Mission Critical applications (up to DAL A)

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Commercial ARINC 818 Examples

B787 Collins Aerospace Proline Fusion Avionics Suite

CMC Esterline SureSight 2700 EVS

L3Harris Large Area Avionics Display

A350XWB Thales Avionics Suite

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ARINC 818 Defined

- What is ARINC 818: Avionics Digital Video Bus (ADVB)?
 - A digital, point-to-point video interface
 - High-bandwidth, uncompressed video, meeting special needs of cockpit displays, sensors and mission critical video systems
 - Built upon the lower layers of Fibre Channel
 - ADVB is simplified over FC-AV (Fibre Channel – Audio Video)
 - Unidirectional
 - No link initialization, flow control, or other Fibre Channel exchanges such as port login

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ADVB technical overview – lower layers

The basics of ADVB-1

- 8b/10b encoded serial link
- 32bit organization
- ARINC 818 does not specify physical layer
 - References ARINC 801, 802, 803, 804
 - Leverage existing Fibre Channel transceivers 850nm, or 1310nm
- A video image is broken into thousands of "packets" information.

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Pick a Rate for your Resolution

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Part 3

Synchronization Classes and Buffering

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Horizontal and Vertical Timing

ARINC 818 Defines four Synchronization Classes

- Class 1: Asynchronous
- Class 2: Frame Sync
- Class 3: Line Sync – most common
- Class 4: Pixel Sync

To pick a class you need to understand:

- Latency (LRU & System) – FIFOs or Frame Buffers
- Video line Jitter tolerance
- Video Frame Jitter tolerance

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ADVB receiver using Ping/Pong image buffers

Receiver designed based on:

- complete image buffers
- No constraints for ADVB frame timing
- Compatible with non-line synchronous classes
- Problem – introduces one frame time of latency

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ARINC 818 -2 and -3 Features

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The slide features a dark background with white text. In the top right corner, there is a small logo for 'GreatHart Technology' and the year '2020'. At the bottom right, the website 'GreatHartTech.com' is visible. The main content is centered and reads 'Next Recommended Videos' followed by 'ARINC 818 -2 and -3 Features'.
