

# Top-Level Review for Porting GE-IP SBS ARINC Programs to Alta Data Technologies

(Please note: GE IP/SBS Function Call Names are Copyright GE Fanuc Intelligent Platforms;  
Alta Function Call Names are Copyright Alta Data Technologies LLC)

# Typical ARINC RX Applications

## SBS API Functions

Init Device

- sbs\_init\_device()
- a429\_create\_global\_sm\_buffers()

Init RX Function

- RX CVT and SM Are Separate Functions – Confusing Setup for Both
- CVT: a429\_init\_recvr\_cntrl\_blk()
- CVT: a429\_set\_rc\_control()
- SM: a429\_create\_rc\_cb()
- SM: a429\_init\_filter\_table()
- SM: a429\_set\_filter\_table()

Turn On RX

- sbs\_start\_io()
- a429\_start\_rc()

Read Data

- CVT: a429\_get\_current\_value()
- SM: a429\_read\_global\_sm\_buffers
- Requires FOR-Loop in code to read data

Close Function & Card

- a429\_stop\_receiver()
- sbs\_stop\_io()
- sbs\_close\_device()

## Alta API Functions

Init Device

- ADT\_L1\_A429\_InitDefault()

Init RX Function

- ADT\_L1\_A429\_RX\_Channel\_Init()
- Allocates Buffers and Sets RX Config
- CVT Table & Multi-Chan Init
- ADT\_L1\_A429\_RXMC\_BufferCreate()
- Optional to Allocate Multi-Channel RX

Turn On RX

- ADT\_L1\_A429\_RX\_Channel\_Start()

Read Data

- 3 Simultaneous User Options for RX (no Loops or pointer management!):
- ADT\_L1\_A429\_RX\_Channel\_ReadNewRxPs()
- ADT\_L1\_A429\_RX\_Channel\_ReadCVTRXP()
- ADT\_L1\_A429\_RX\_MC\_ReadNewRXPs()

Close Function & Device

- ADT\_L1\_A429\_RX\_Channel\_Stop()
- ADT\_L1\_A429\_RX\_Channel\_Close()
- ADT\_L1\_CloseDevice()

Alta Functions are Well Designed for Embedded and Test Applications

# Typical ARINC TX Applications

## SBS API Functions

Init Device

- sbs\_init\_device()
- a429\_create\_global\_sm\_buffers()
- Why do this for TX? Bad Design

Init TX Function

- 429\_create\_tx\_cb()
- Optional Minor Frame Timing:
  - a429\_add\_mf\_cmd\_blk()
- Minor Framing Does Not Follow Typical ARINC HZ Programming – Complicated.
- a429\_add\_tx\_cmd\_blk()

Turn On TX

- sbs\_start\_io()
- a429\_start\_xmitter()

Write Data

- Complicated Process to Update Data
  - a429\_write\_type\_word()
  - a429\_read\_type\_word()
  - a429\_write\_tx\_cb\_data()

Close Function & Card

- a429\_stop\_xmitter()
- sbs\_stop\_io()
- sbs\_close\_device()

## Alta API Functions

Init Device

- ADT\_L1\_A429\_InitDefault()

Init TX Function

- ADT\_L1\_A429\_TX\_Channel\_Init()
- Allocates Buffers and Sets TX Config
- Optional to Create TX Control Blocks for Flexible HZ Control of 1 or More Labels per Hz.
- ADT\_L1\_A429\_TX\_Channel\_CB\_TXPAllocate()
- ADT\_L1\_A429\_TX\_Channel\_CB\_Write()
- ADT\_L1\_A429\_TX\_Channel\_CB\_TXPWrite()

Turn On TX

- ADT\_L1\_A429\_TX\_Channel\_Start()

Write Data

- Simple Process to Update Data –Simple Write to Buffer Location. Two Simultaneous Methods.
- Optional One Shot/Aperiodic of 1-N Labels with: ADT\_L1\_A429\_TX\_Channel\_SendLabel():SIMPLE
- ADT\_L1\_A429\_TX\_Channel\_CB\_TXPWrite()

Close Function & Device

- ADT\_L1\_A429\_TX\_Channel\_Stop()
- ADT\_L1\_A429\_TX\_Channel\_Close()
- ADT\_L1\_CloseDevice()

Alta Functions are Well Designed for Embedded and Test Applications

# Alta API Highlights

- **Alta API Provides Logical, Well Designed Functions. This Should Simplify Porting of Applications and Provide for Better Long Term.**
- **In Most Cases, Alta Requires Fewer Steps to Execute the Same Task. This will Simplify Code Logic and Management. Code Porting Time Should Only Be 1-2 Days for Most Tasks.**
- **Alta Provides Memory Management Functions. Memory Can Allocated/Freed as Needed.**
  - SBS Does not Provide Advanced Memory Management.
- **Alta Allows for Independent Channel Devices and Channel Bank/Devices to Support Multi Applications**
  - SBS Treats ALL Channels and Boards as One Device, Which Can Greatly Complicate Multi Channel Applications
- **Alta's API is a Modular, Multi-Layer API That Can Easily Port to Various Operating Systems.**
  - Condor's API is not multi-layer – Condor's is old monolithic design with OS dependencies scattered through out code. Condor's API is mainly written for Windows.
- **Alta Provides both ANSI C Level Functions for standard Windows, Linux and RTOS Applications and "Managed" Assemblies for advanced Windows C++/C# Compatible Applications. This greatly reduces integration time for C#, LabVIEW and other advanced software tool sets.**