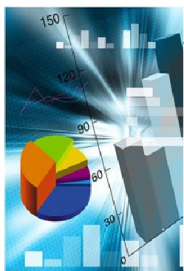# GLOBALink:
News and Status Report

Prepared for:

AEEC Data Link Users Forum
February 4-5th, 2014
Safety Harbor, FL

Rockwell Collins
Building trust every day

Topics for Discussion

Service Summary and Statistics

Expansion of ACARS VHF and VDL Regions

Long Range Media: HFDL, SATCOM, and Iridium
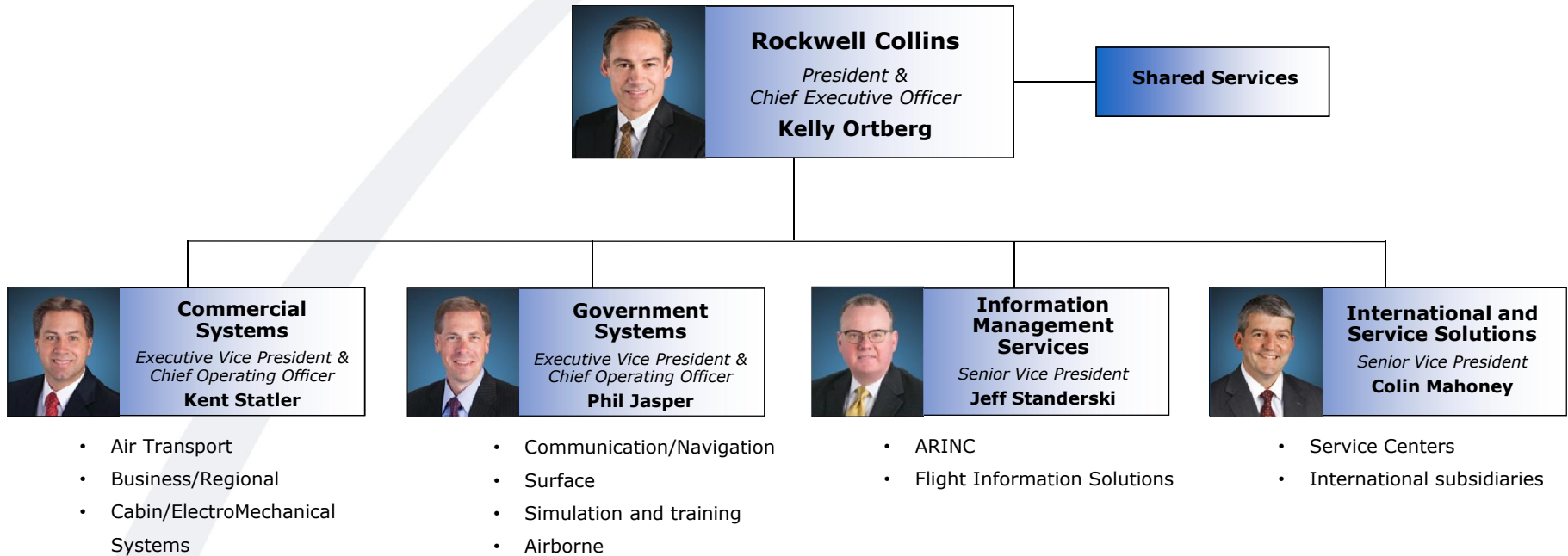
VDL Multi-Frequency OAT and Deployment

AEEC Query: Capacity for emerging aircraft fleets

Rockwell Collins Acquisition

Rockwell Collins Business Unit Leadership

Rockwell Collins
President &
Chief Executive Officer
Kelly Ortberg

Shared Services

Commercial Systems
Executive Vice President & Chief Operating Officer
Kent Statler

- Air Transport
- Business/Regional
- Cabin/ElectroMechanical Systems

Government Systems
Executive Vice President & Chief Operating Officer
Phil Jasper

- Communication/Navigation
- Surface
- Simulation and training
- Airborne

Information Management Services
Senior Vice President
Jeff Standerski

- ARINC
- Flight Information Solutions

International and Service Solutions
Senior Vice President
Colin Mahoney

- Service Centers
- International subsidiaries

Information Management in Aviation

Aircraft Computing Environment

- Highly secure and regulated

- Mission critical dependability

- Environmental, weight, and power limits

- Complex connectivity requirements

Rockwell Collins Strength

Aviation Industry Ground Systems

- Highly secure and regulated

- Mission critical dependability

- Interoperable with proprietary networks

- Global network coverage footprint

- Domain specific content and services

ARINC Strength

Integrated End-to-End Solutions

Combined Strength

Rockwell Collins and ARINC combination creates customer and shareholder value by addressing currently unmet need for integrated end-to-end solutions

What Does This Mean to Airlines?

- **Continued Focus on Quality and Customer Satisfaction**

- **Continued commitment to mixed-fleet solutions**

- **You will work with same people from both ARINC and RC**

- **Product roadmaps will evolve, initial focus areas include:**
  - Global network – air to ground and ground to ground
  - Nose to tail connectivity solutions
  - Operational Efficiency solutions
    - Hermes & Op Center alignment
    - E-Enablement
    - Value added apps & mobility
  - Targeted integrated solution programs

- **Great time for you to provide input!**
  - Contact your account representative or the integration team directly
  - Rick Moore - rgmoore@rockwellcollins.com
  - Ron Hawkins – rhawkins@arinc.com

Long-Range Communications Media: Inmarsat, Iridium, & HFDL

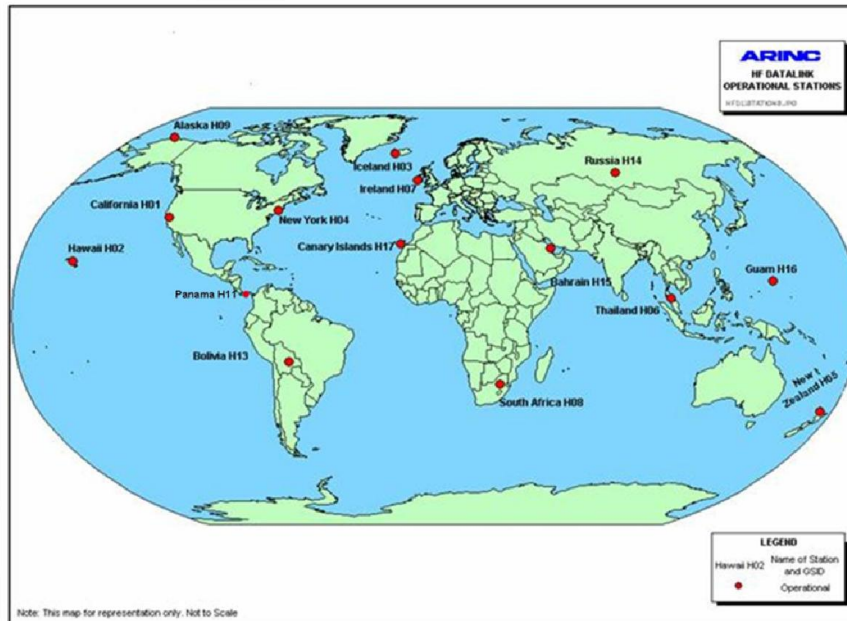# Inmarsat I3 & I-4 Connectivity for Classic Services

- Continuing to offer Classic Aero services over the I-3 and I-4 satellite networks
  - Message Success Rate: 99.1%
  - ACARS Block Transit Time: 8 seconds

- Aero-H and Aero-I services end-of-life scheduled to coincide with the I-3 satellite decommissioning

- Available Services Over the I-4s:
  - Classic Aero:
    - ACARS (Data-2)
    - Cabin (Data-3)
    - Voice
  - SwiftBroadband:
    - Standard IP/Streaming IP/Circuit-switched Voice
    - Simultaneous voice and broadband data (up to 432kbps)
    - Supporting Inmarsat in SB-S Trials
    - Completed AQP for First Cobham/Trane SB-S Avionics Suite

ARINC | 8
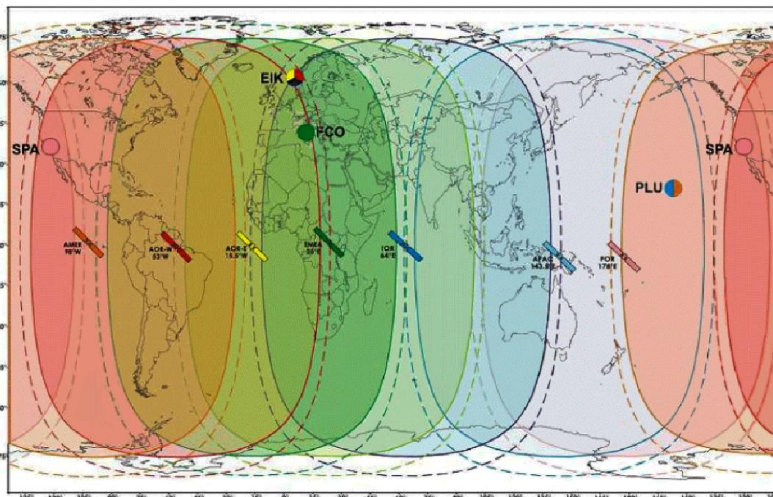
GLOBALink/HFDL Continues to Grow

- GLOBALink/HF Statistics for 2013:
  - 7.5% increase in equipped aircraft (2137)
  - 5.0% increase in total message traffic
  - 12 new airline customers (Total: 82)

- Honeywell HFDR (2007) software upgrade is highly recommended for greatly improved performance in all fleet types
  - Boeing
    - Fully Approved
  - AIRBUS
    - Forward Fit Approved and Delivered
    - Long awaited retrofit SB is due out in Feb 2014.

HFDL Global Usage Today: December 2013

H01 - California, USA   H05 - New Zealand   H09 - Alaska, USA
H02 - Hawaii, USA   H06 - Thailand   H11 - Panama   H15 - Bahrain
H03 - Iceland   H07 - Ireland   H13 - Bolivia   H16 - Guam
H04 - New York, USA   H08 - South Africa   H14 - Russia   H17 - Canary Is.
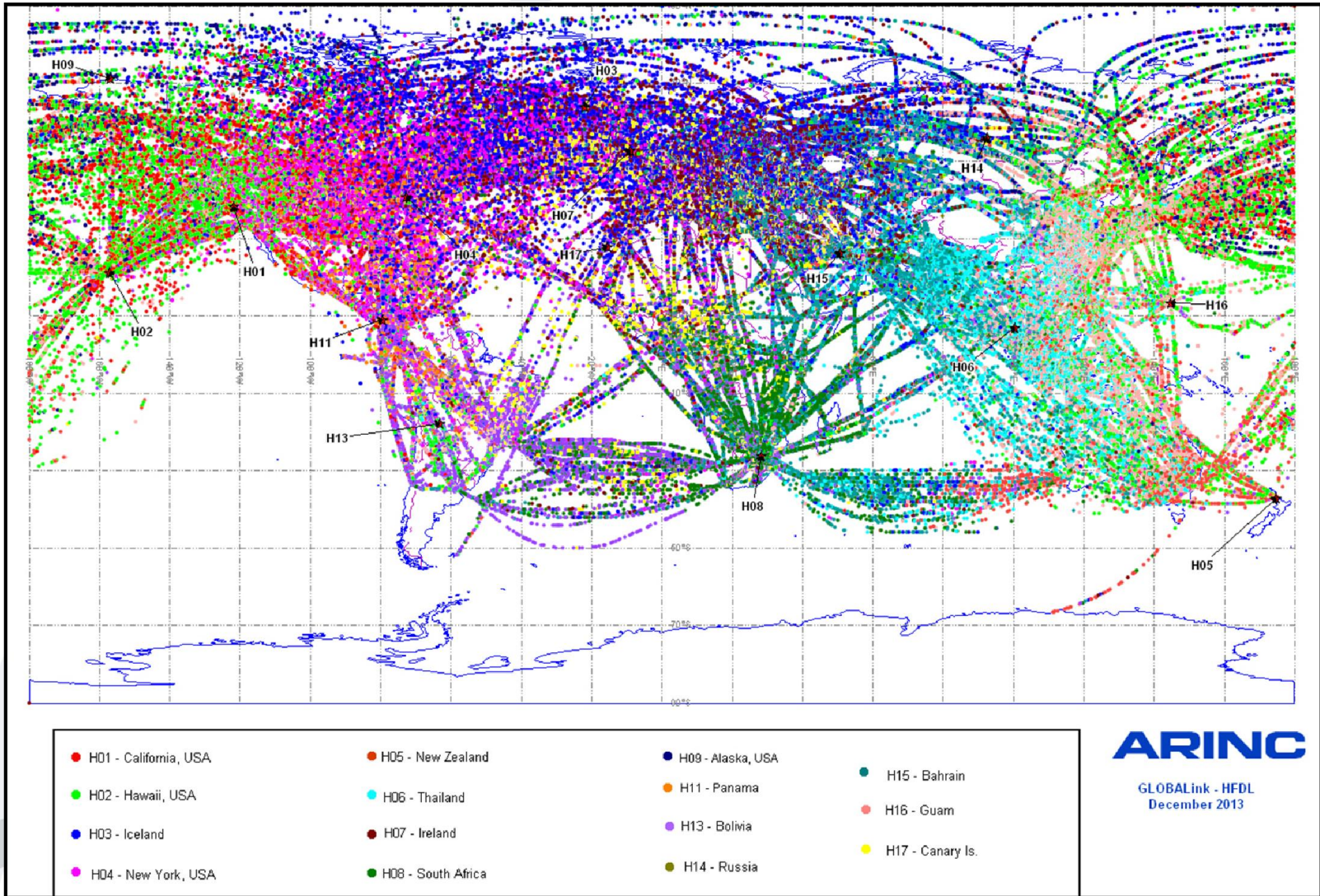
ARINC

GLOBALink - HFDL
December 2013

GLOBALink/Iridium

- Iridium Satellite is complementary to ARINC's GLOBALink media
  - Global coverage using LEO satellite constellation; new constellation being prepared for deployment
  - Voice and ACARS Over-Iridium (AOI) using Short-Burst-Data (SBD)
  - Integrates seamlessly with the GLOBALink ACARS Services

- GLOBALink/Iridium Statistics (Dec 2013):
  - Uplink Message Success: 95.9%
  - Ave. Block Transit Time: 25.2 seconds
  - Nearly 400 Air Transport Aircraft & 450 Business Aviation users

- AQP Testing Continues: Tested and Approved in 2013:
  - ICG ICS-120A/220A Firmware Revs: 09 & 12
  - AirCell ST4200
  - FLYHT AFIRS 228F

Advantages of Inmarsat and Iridium Satellite Media

FEATURE	INMARSAT AERO	IRIDIUM
Coverage	Worldwide Except Polar Caps	Worldwide
Data Rates	Aero: 1.2 kb/s to 10.5 kb/s SBB: 64k – 432 kb/s	Aero: 2.4kb/s Open Port: 128 kb/s
Number of Channels/SDU	6-11	2-3
ACARS Block Transit Times	8 seconds	25 seconds
ACARS Message Success Rates	99%	95-96%
FANS Approved?	Yes	Yes
Voice Services	Yes	Yes
High Speed Data?	Swift Broad Band	Open Port

ARINC GLOBALink Services

Visions for the next decade….

What will be the industry's communications needs for the next decade?

- Expect exponential growth in the amount and quality of communications & information required by airline operations, CAAs, and airframers
  - *MORE Data*: Better, faster, reliable, accurate, and intuitive

- Conservation and environmental concerns will drive the industry to increased regional flights, operating more efficiently
  - Growth in regional airports and aircraft
  - Dramatic growth in the demand on ATC and automation
  - Advanced CNS/ATM concepts required, including 4-D trajectories

- Newer aircraft demand more real time diagnostic & FOQA data
  - Aircraft are being populated with stress monitoring sensors

Demand for capacity will drive major upgrades to existing communications media and the deployment of new media

Page

AEEC DLUF Question to DSPs

- How will ARINC support the growing data requirements for new and developing aircraft fleets?

- ARINC has continued to deploy network bandwidth and capacity to stay ahead of industry requirements

  - Extensive deployment of VDL Mode 2 stations worldwide

  - Addition of second USA VDL Mode 2 frequency is planned and underway

- VDL Mode 2 and emerging technologies, such as 802.11 & SB-S, have the speed and capacity for high volume data applications

- Aircraft type does not clearly define data capacity requirements

  - Request expected data requirements for aircraft type

  - Further defined by flight phase (gate, taxi, airborne)

System & VHF Network Status

GLOBALink Service Statistics

GLOBALink Customers:	206
GLOBALink: Kilobits/Month:	124 Million (VHF) ~12 Million (Aero-SAT) 0.75 Million (Iridium-SAT)
Classic VHF Stations:	1131 (1023 Sites/119 Countries)
VDL Mode2 Stations:	515 (466 Sites/31 Countries)
2013 Uplink Message Success:	98.6% (POA) / 98.5% (AOA)
VDL Block End-to-End Transit (Ave):	1.9 seconds
Major Growth Areas:	Latin America: Complete Major Expansion Areas: - Eastern Europe/Russia - Africa

Expansion of GLOBALink/VHF Coverage

ARINC continues to expand GLOBALink/VHF in the Americas, Europe, Asia, the Middle-East and Africa…

Notes:
The map projection is Geographic and is for representation only. Not to scale. Terrain obstructions are not considered.

Legend:
- ● Frequency 131.550
- ● Frequency 131.725
- ● Frequency 131.825
- ● Frequency 131.450
- ● Frequency 131.475

ARINC VHF - World
Frequency Coverage

Drawn By: bsisas

File Name: world_frequency.mxd

Effective Date: August 07, 2013

ARINC
Annapolis, MD
www.arinc.com
https://portal.arinc.net

# GLOBALink/VHF North America: 2014 Plans

- Complete ACARS POA coverage throughout North & Central America
  - Steady state for POA
  - Selected airport additions

- Extensive VDL Coverage across North America
- ALL USA Stations are now VDL Mode 2 capable stations
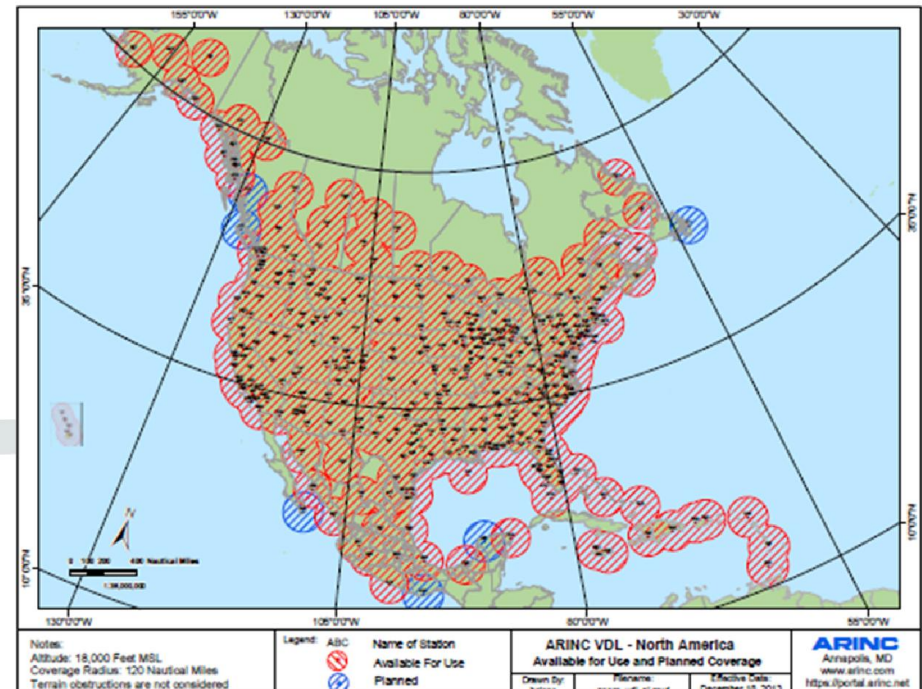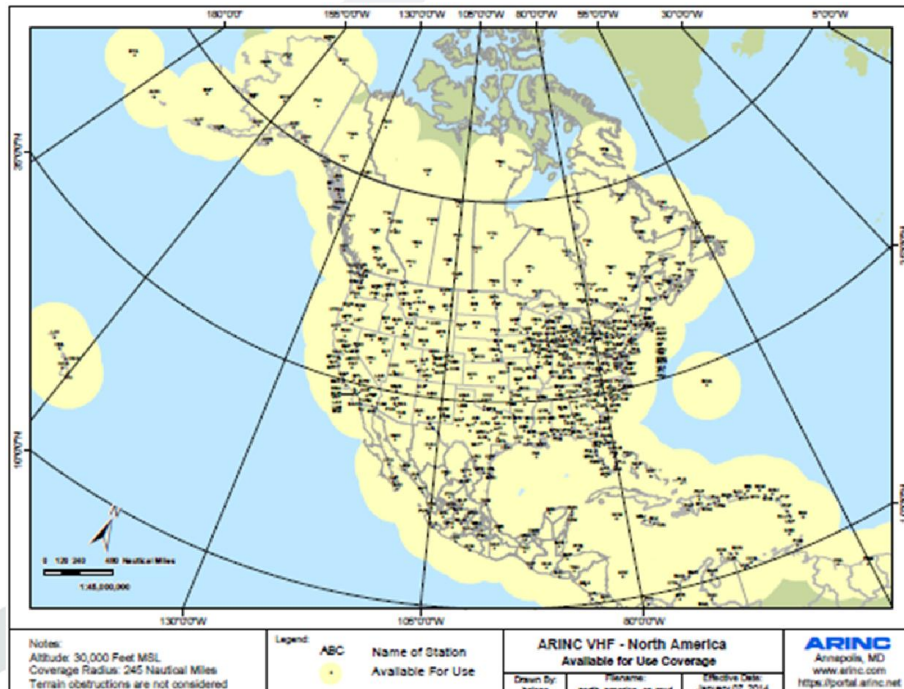
VDL Mode 2 Multi-Frequency Expansion

- All VDL Mode 2 activity since 2000 has been on the Common Signaling Channel (CSC)

- Expanded VDL capacity is through the AEEC 631 AVLC "VDL Multi-Frequency" Protocols

- ARINC CPS is ready; successful VDL Mode 2 Multi-Freq OAT performed in the USA 2013
  - Sites: Memphis and Las Vegas
  - Participants: 106 Aircraft from FedEx and Southwest Airlines
  - Fielded aircraft supporting VDL FM is limited; AQP found issues with some CMUs
  - GMP customized to recognize and command aircraft with support
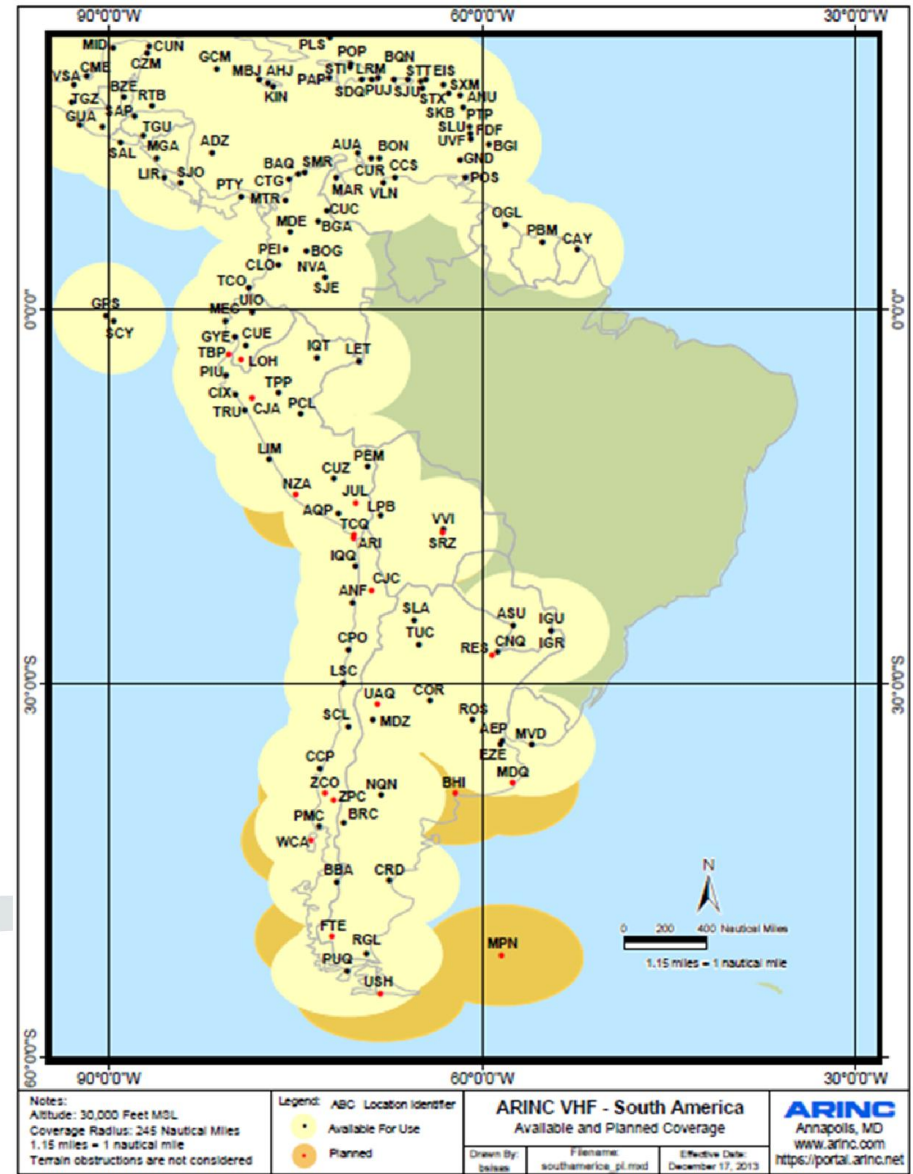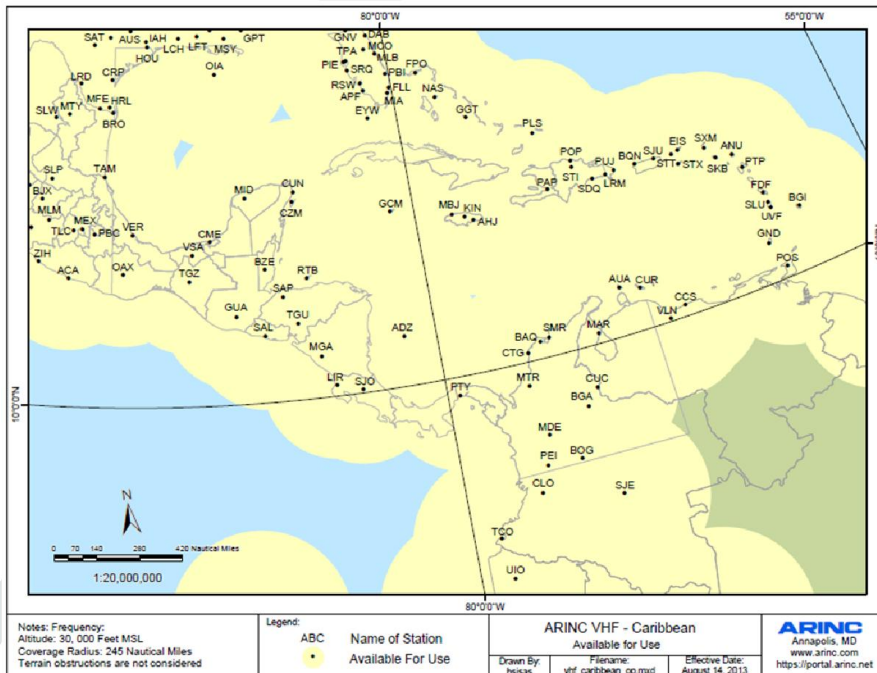
- ARINC ready for VDL expansion…
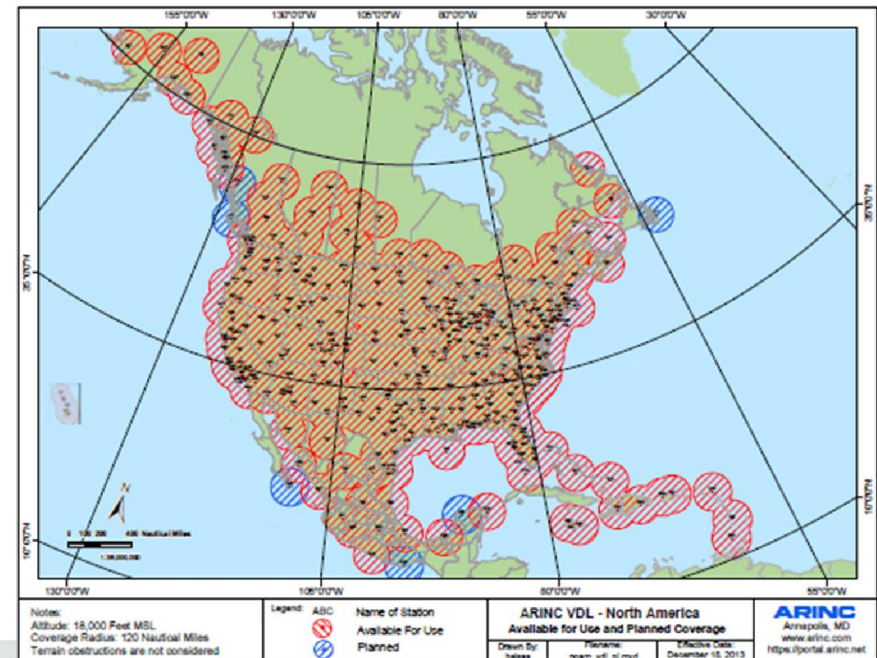
# International VDL Mode 2 Service Expansion
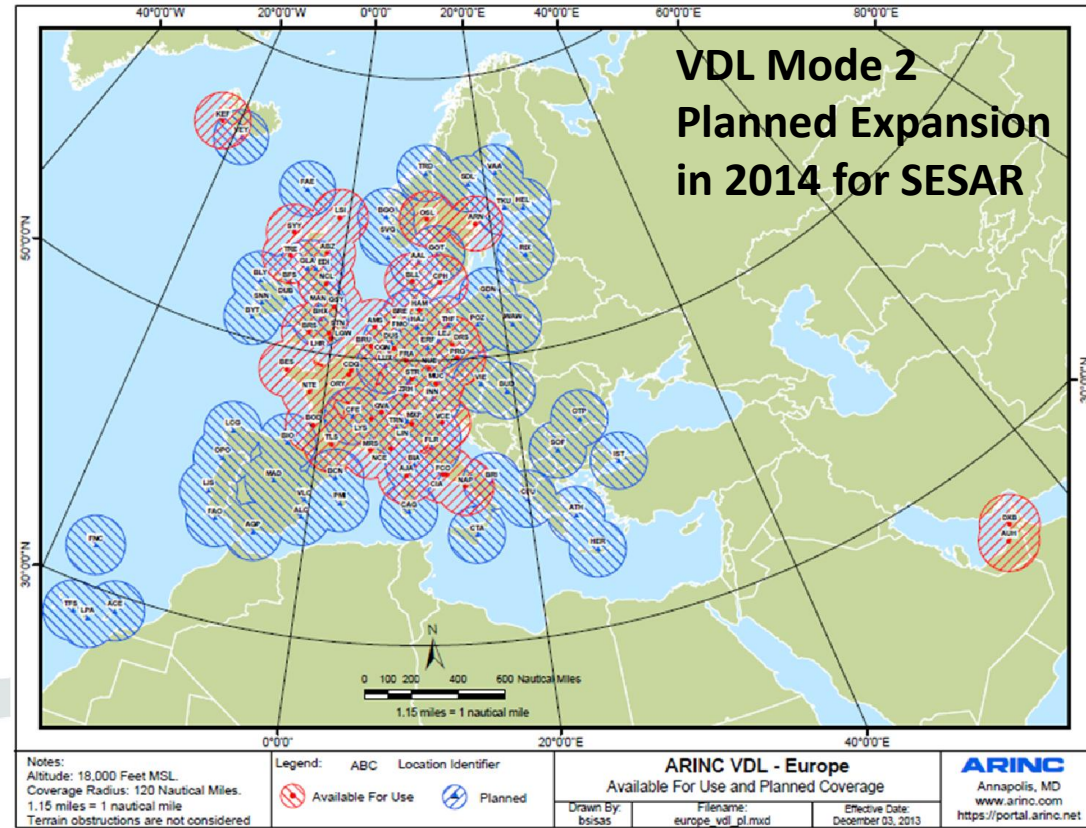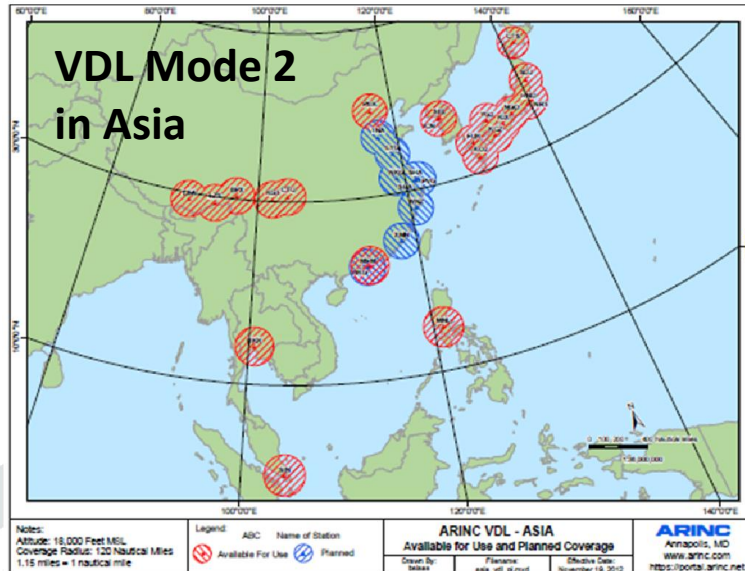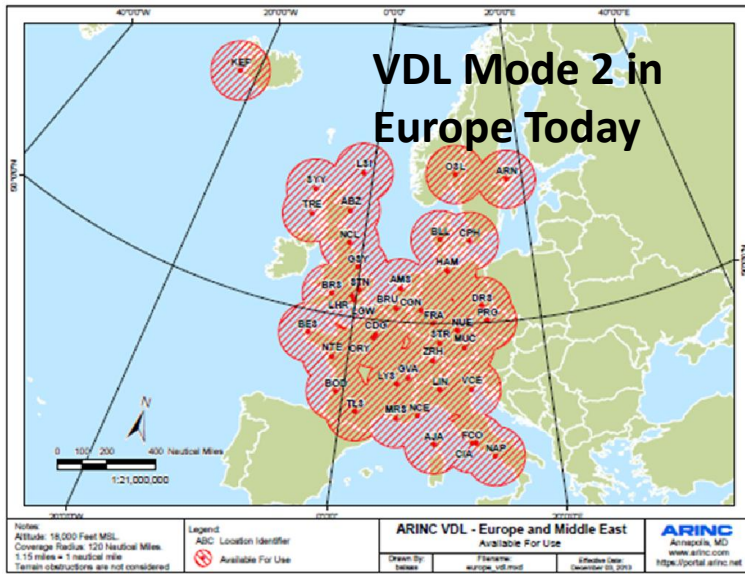
South America/Caribbean

- South America Deployment Complete
  - Selected station deployment for on-airport coverage in 2014
- Caribbean coverage complete
  - Petitioning US Government for RGS deployment in Cuba

Europe & Middle-East

- ACARS VHF Service available on 131.825 MHz

- Major expansion planned for Eastern Europe and Russia in 2014

ARINC VHF - Europe and Middle East
Available For Use and Planned Coverage
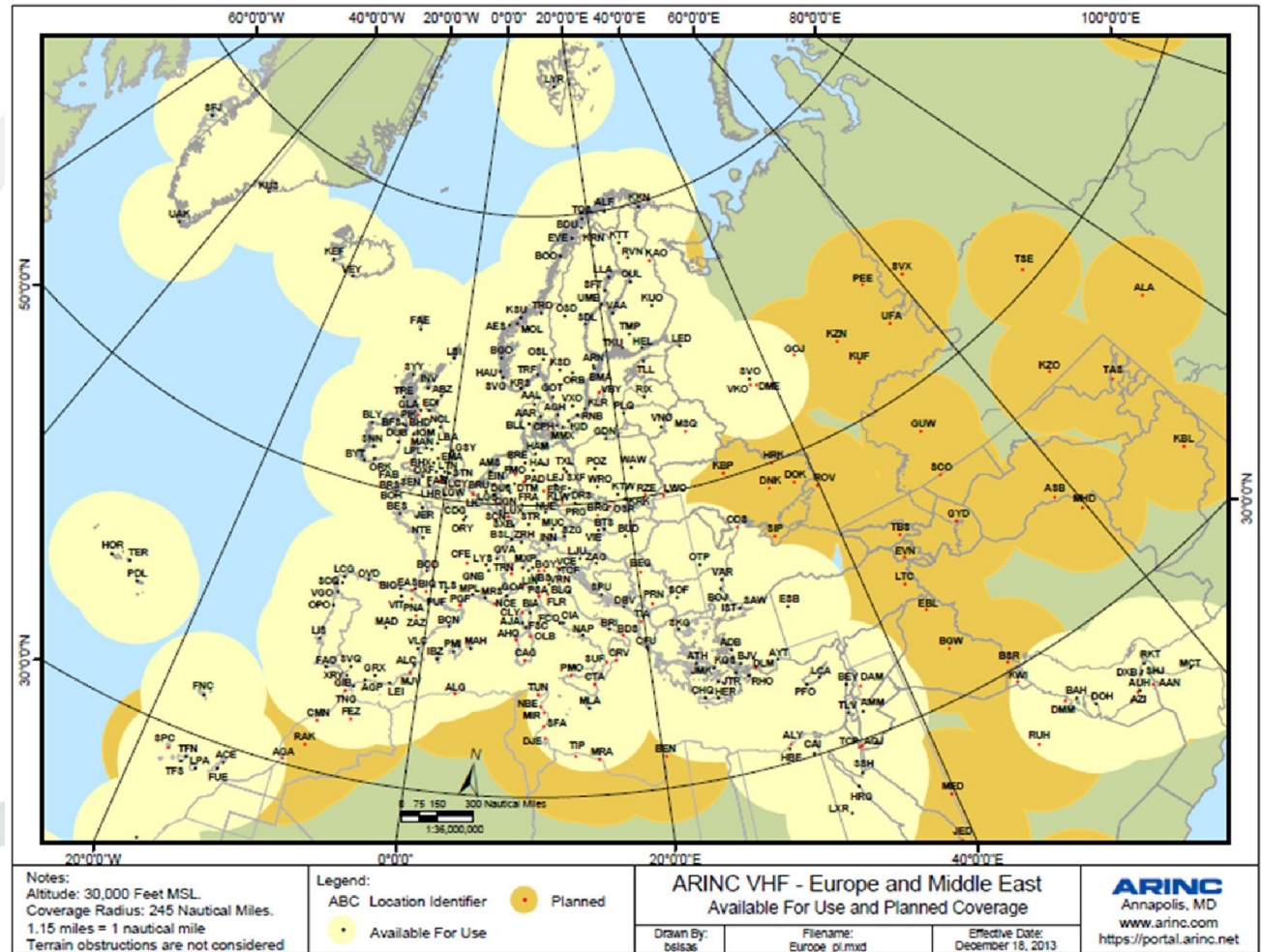
Summary

- GLOBALink continues to lead the aviation industry with superior service, availability and technical support

- ARINC continues to invest heavily in network infrastructure and is well poised to support the industry into the next era of highly integrated aircraft communications and applications including CNS ATM services