Avionics Mandates

A Snapshot into the Future

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YOUR SWISS COMPETENCE CENTER IN AVIATION!

ROPS

FDR/CVR

EGNOS

RNP 1

ELT

ADS-B

EHS / ELS

Link 2000+

PRNAV

CPDLC – FANS 1A

8.33kHz

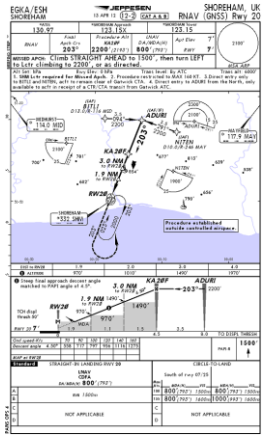
ACAS II

RVSM

Data Link Recorder System

Point in Space Approaches

- Several already mandatory to be implemented on your aircraft
- Several not yet mandatory to be implemented
- Several only in planning

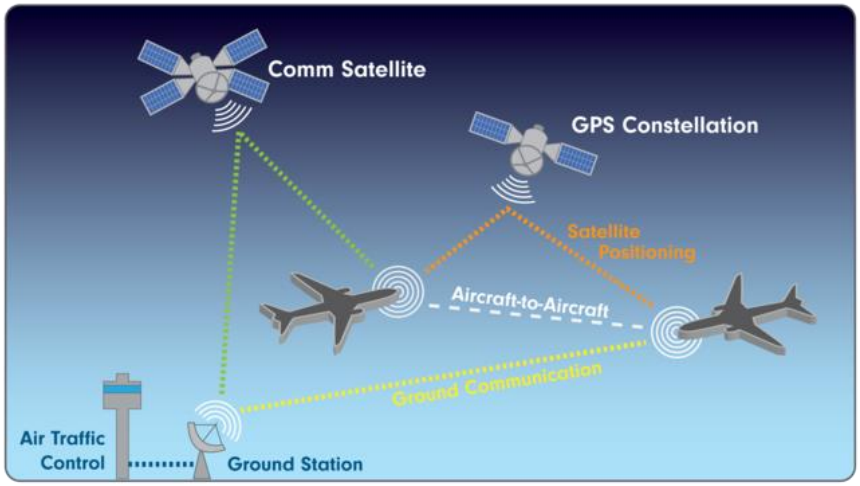


EUROCONTROL

EUROPEAN AVIATION SAFETY AGENCY
AGENCE EUROPÉENNE DE LA SÉCURITÉ AÉRIENNE
EUROPÄISCHE AGENTUR FÜR FLUGSICHERHEIT

FOCUS TODAY

ADS-B



CPDLC – FANS 1A

ADS-B Out

Automatic Dependant Surveillance Broadcast – Out

Mandate: MTOM > 5700 kg **or**
Maximum True Airspeed > 250 knots

Date of applicability: **8 June 2016** for new production aircraft **and**
(EUROPE) **7 June 2020** for retrofitting

Function: Transmission of accurate aircraft data to ATC ground stations
and other aircraft within range intended for aircraft's surveillance

Required Equipment: DO-260B approved Transponder Systems
WAAS/SBAS Flight Management System
Altitude Encoder

Datalink Communications

FANS 1/A+ – Future Air Navigation System

Mandate: 20 January 2020 for retrofit, -> Above FL 290

Applicability: Oceanic Airspace and Remote Areas

Specifications:

- **Use of AFN protocol over existing ACARS network (VHF and SATCOM)**
- **Includes ADS-C for automatic oceanic position reproting**

Datalink Communications

PM CPDLC – Protected Mode Controller Pilot Data Link Communication

Mandate: 30 January 2020 for forward-fit and retrofit, -> Above FL 285

Applicability: European Continental Airspace

Specifications:

- Use of ATN network & protocol with VDL Mode 2 VHF data link
- Improved data integrity with end-to-end message checksum vs. FANS
- Ensures messages are delivered correctly to the intended aircraft

QCM design`s STC`s

Hook Release
Installation
EC 130 T2

Ovation Select CMS
Global Express

TAS 605 Installation
EC 130 T2

CD-830
Installation
Hawker 800XP

ADS-B Out Capability
Cessna 525

LOPA Change
Challenger 604

Next….. Jean Luc

In Flight Connectivity

Rosenfeld Jean-Luc
FlyConnected Consulting

FlyConnected Consulting

- 20 Years of Experience
- Specialized in IFE and IFC
- Neutral advice
- Customized and turnkey solutions

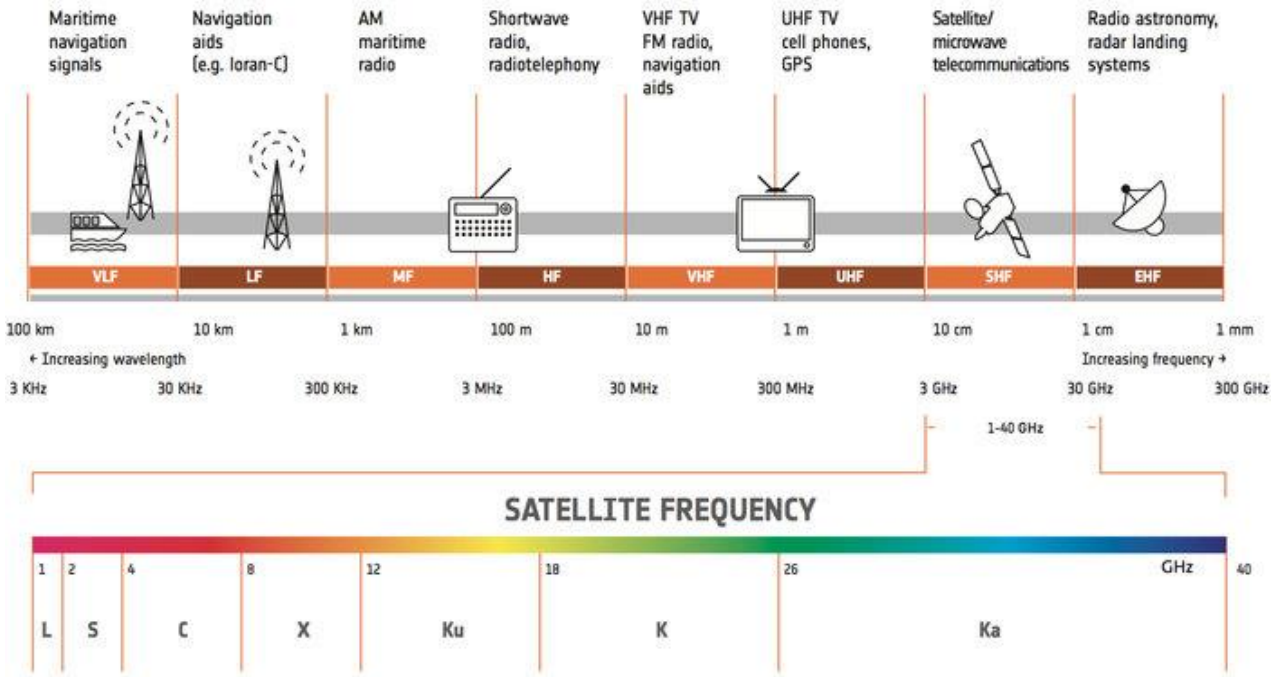
Be Prepared

- Ask you the right questions:
  - **What are your expectations?**
  - Where do you fly?
  - How many hours per year?
  - How many customers per flight?
  - Do you charter the airplane?
  - What is your budget?

Network Basics

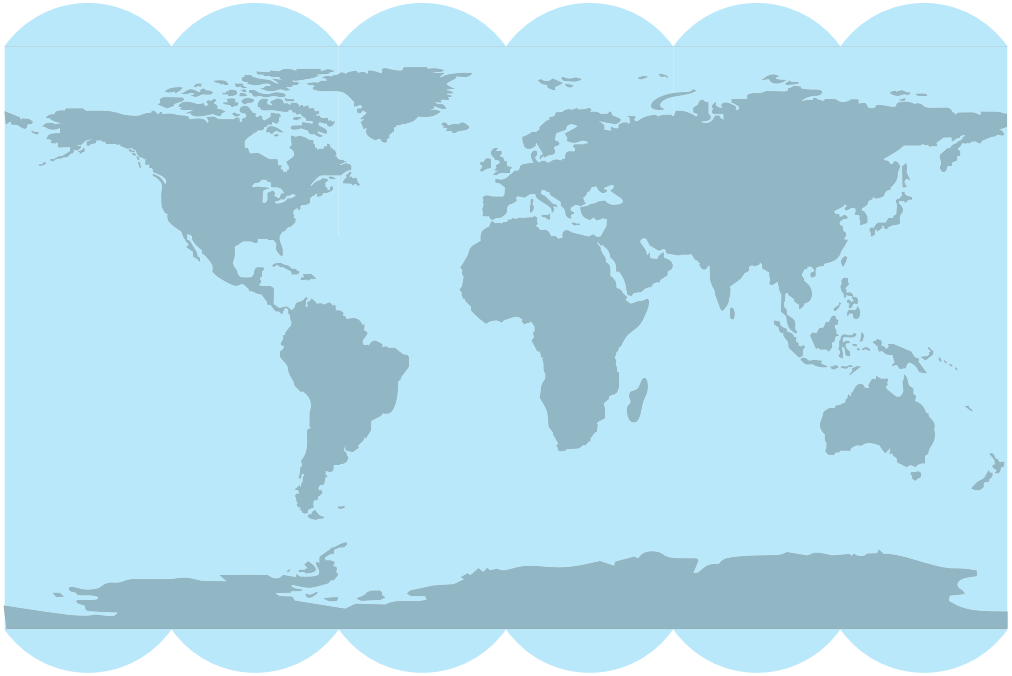
- Each Network is different:
  - Coverage
  - Speeds
  - Hardware cost
  - Service cost
  - Weather impact
  - Installation complexity

Network Definition



Iridium

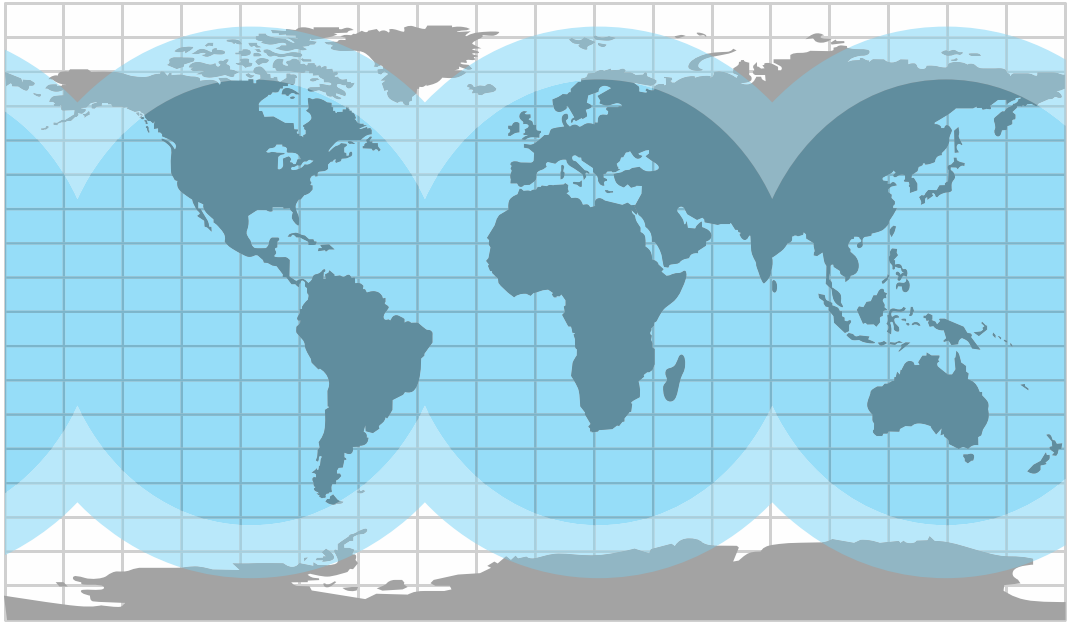
Reliable coverage in the Air and on the Ground



•All altitudes and latitudes. Even in polar regions.

Inmarsat SwiftBroadband

Near-global or multi-regional coverage

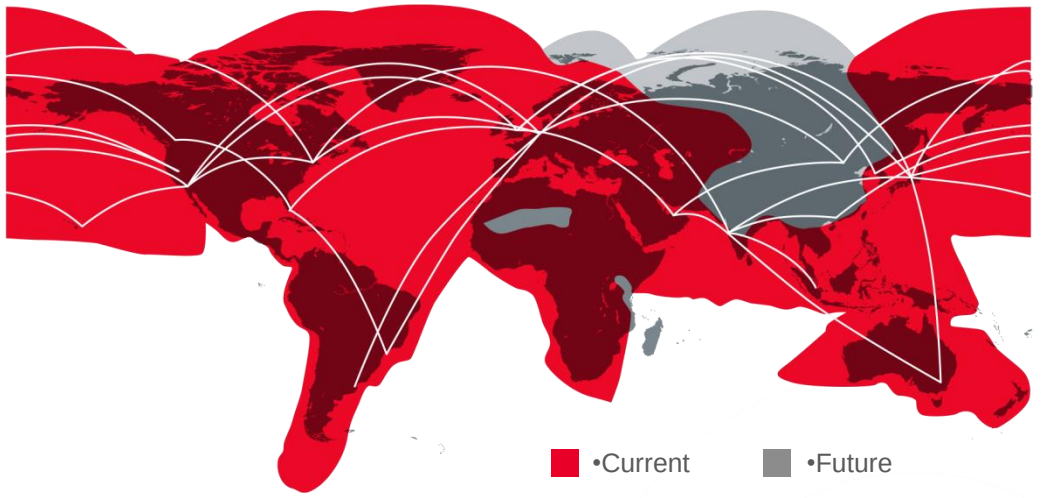


• Low Gain Antenna • IGA & HGA

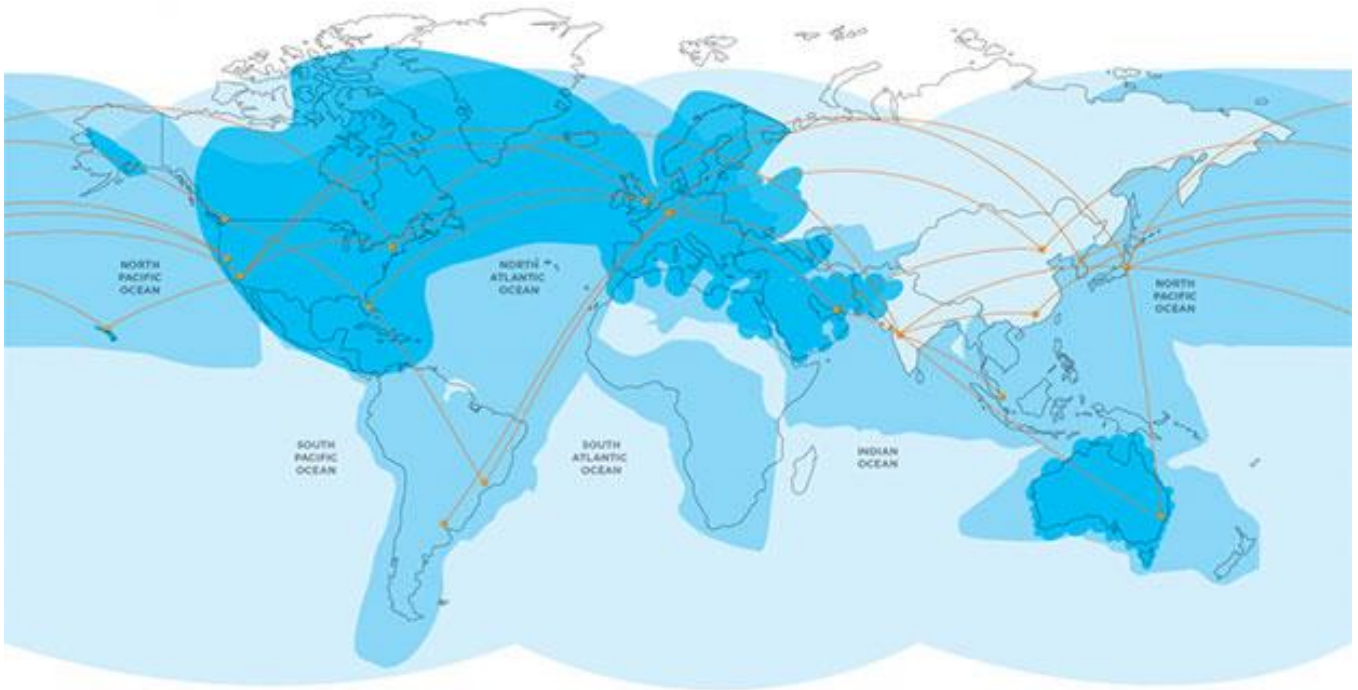
SwiftBroadband

Ku by Gogo

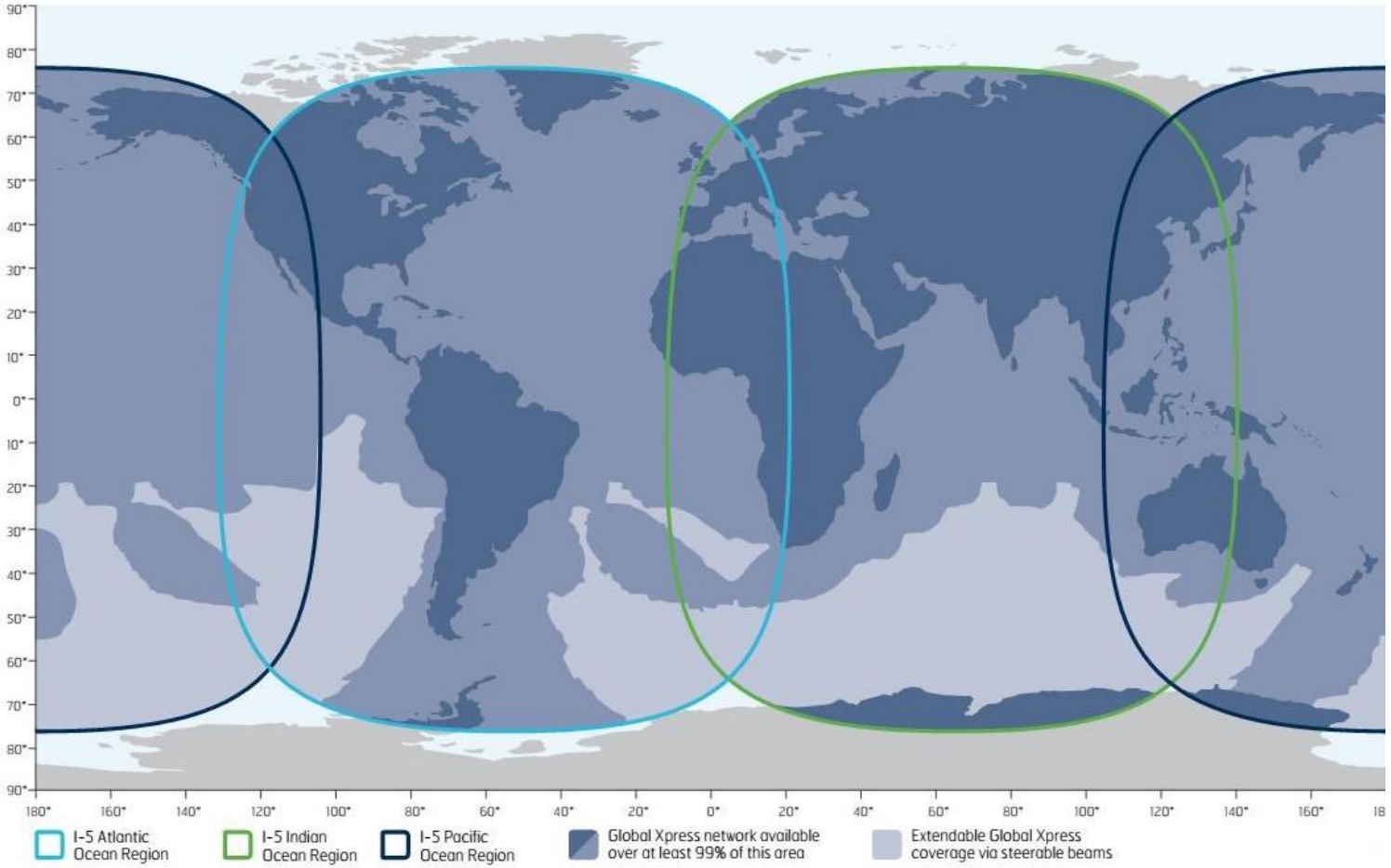
Multi-regional coverage



KU & KA by Viasat

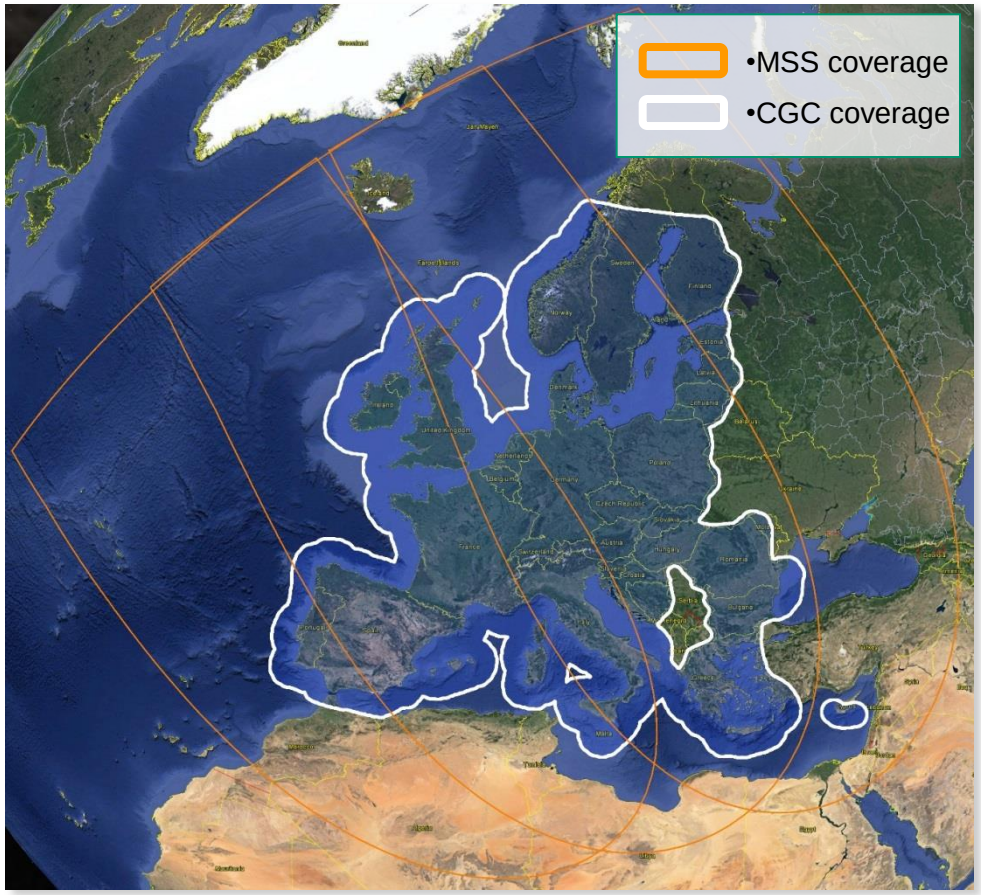


KA by Inmarsat



European Aviation Network

Illustrative coverage @150km radius



- EAN's cell coverage will be optimised with varying cell sizes up to 150km radius depending on capacity required in area
- Cells may also be deployed in Canaries, Madeira
- Test cells to be deployed in the UK, flight trial testing Q3 2016
- We have flexibility to provide a wider MSS coverage

Cost

Network	Speed	Cost	For who?
SwiftBroadband	200kpbs-800kbps	$60k-$150k	All biz jets
KU Viasat	Up to 4Mbps	$600k	Heavy Jets
2KU Gogo	Up to 100Mbps	$600k	Airliners (BBJ)
KA	Up to 50Mbps	$750k	Heavy Jets
EAN	Up to 75Mbps	$1Mio	Airliner

Service

Network	CIR Commited information rate	MIR Maximum information rate	Pricing
SwiftBroadband	No	No	$5 to $8.0
KU Viasat	No	1.5 to 2Mbps	$12k to $35k
2KU Gogo	20Mbs	100Mbps	$25k to $1Mio
JetConnex	1 to 6Mbps	3 to 15Mbps	$7k to $40K
EAN	TBD	N/A	Airliner

Summary

- Defined your needs
- Set your expectations
- Understand the networks
- Have an idea about the costs

Next steps

- Get quotes
- Find STC’s
- OEM offers?

Questions ?