Inmarsat – Global Mobile Satellite Communications

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Tom Bradley
European Manager
Government Services
tom_bradley@inmarsat.com

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Topics:

- Overview of Inmarsat
- Current products and services
- I4 programme

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Overview of Inmarsat Today

- Leading global mobile satellite communications service provider
  - Data and voice to maritime, land and aeronautical markets
  - 24 years of market, technical and regulatory experience
    - Established in 1979 as an international co-operative
    - Privatised as a United Kingdom entity in April 1999
    - Bid by Apax/Permira – Oct 03
    - Completed Nov 03 and now under new ownership
  - 9 successful satellite launches (Inmarsat-2 and Inmarsat-3 fleets); all satellites fully operational
  - More than 300,000 registered terminals
  - US Navy is single largest end-user of Inmarsat services today

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Partnerships – the way we work

- **Land Earth Station Operators**
  - These are our direct customers and are some of the worlds largest telcos:
    - Telenor, France Telecom, Singtel, Xantic, Stratos, KDDI
  - Inmarsat wholesales satellite capacity to the LESOs
  - LESOs provide end-users with end-to-end services through both direct and indirect sales
    - Supported by Inmarsat Service Providers
  - Manufacturers – leading names in mobile satcoms
    - Nera, T&T, Japan radio Co, Furuno, Thales, Collins, Hughes Network Systems

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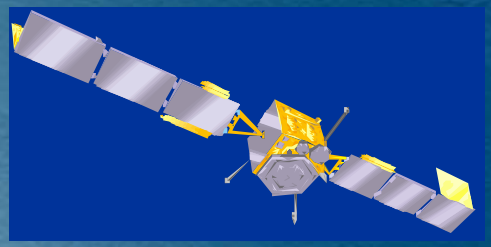
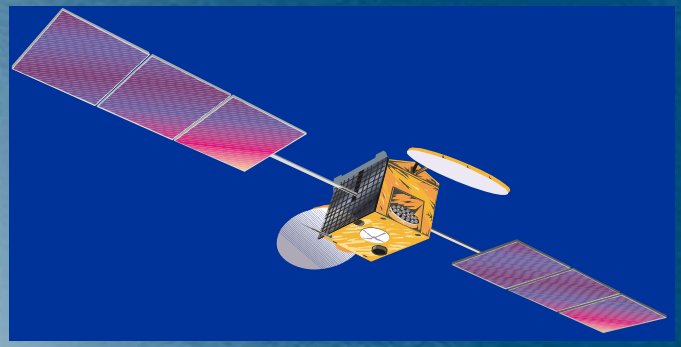
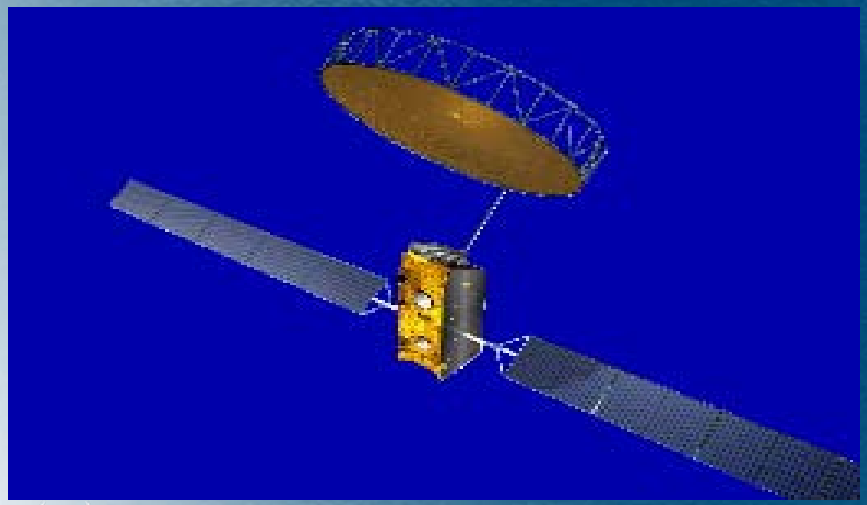
Growth in Inmarsat Spacecraft Capabilities







- **Inmarsat 2 (Operational 1990)**
  - 39 dBW EIRP
  - ~20 MHz Processed Bandwidth
  - 1465kg Launch Mass
  - 14.5 m Solar Array Span
- **Inmarsat 3 (Operational 1996)**
  - 49 dBW EIRP
  - ~60 MHz Processed Bandwidth
  - 2038kg Launch Mass
  - 20.5 m Solar Array Span
- **Inmarsat 4 (Launch from 2004)**
  - 67 dBW EIRP
  - ~130 MHz Processed Bandwidth
  - Over 200 spot beams
  - ~ 6000 kg Launch Mass
  - 48 m Solar Array Span

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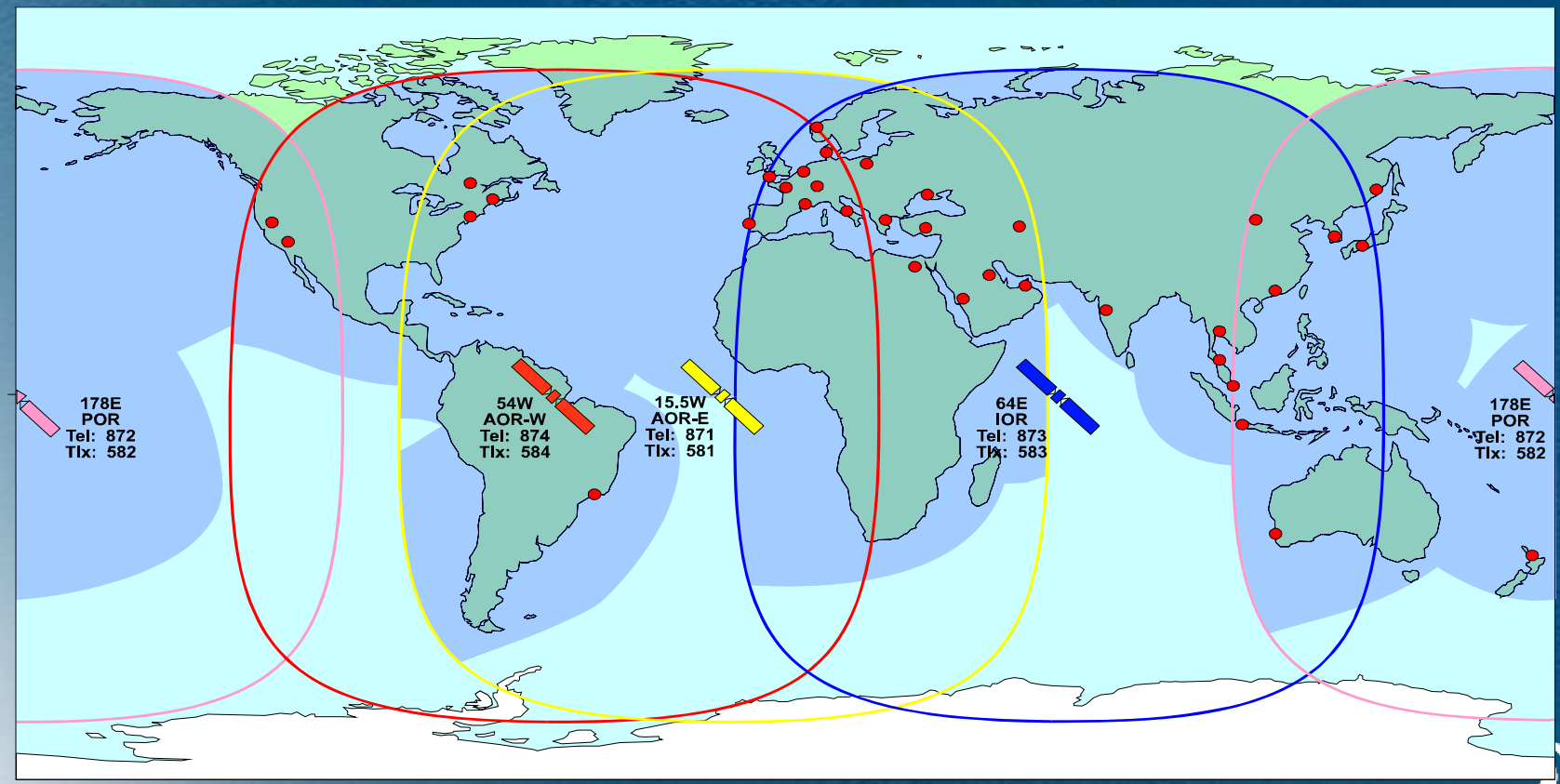
Current Coverage

Two decades of creating systems which offer global reach and high-quality bandwidth ...



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Inmarsat Services

- ***GAN***
  - *Mobile voice and data services. 64 Kbits/sec*
  - *Connects to Telephone network and Internet*
- ***Regional BGAN***
  - *Mobile GPRS (data only) service. 144 Kbits/sec*
  - *Can be migrated to...*
- ***Future – BGAN***
  - *Mobile UMTS global voice, data*
  - *432 Kbits/sec*

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Global area Network (GAN)

- Provides 2 types of connection; circuit switched service and packet switched service(MPDS).
- The circuit switched service provides a point to point 64kb/s data rate.
- The MPDS service shares 64k bearers between multiple users. Capacity is allocated to the user based upon the number of users sharing the bearer.

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Global Area Network - GA

- Voce, fax, data
- Virtually global coverage
- High bandwidth up to 64 kbps
- 4 Manufacturers offering greater product choice
  - Highly portable
  - Rugged
  - Mobile ISDN & Mobile Packet Data
  - Encryption compatible
  - Vehicle Mounted
- 9 LESOs providing core GAN services, 4 of which also offer Mobile Packet Data

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Vehicular GAN

- Mounted on any vehicle
- Permanent fixed tracking antenna
- Provides real time access on the move to all services
- Mobile ISDN and Mobile Packet Data Service offering

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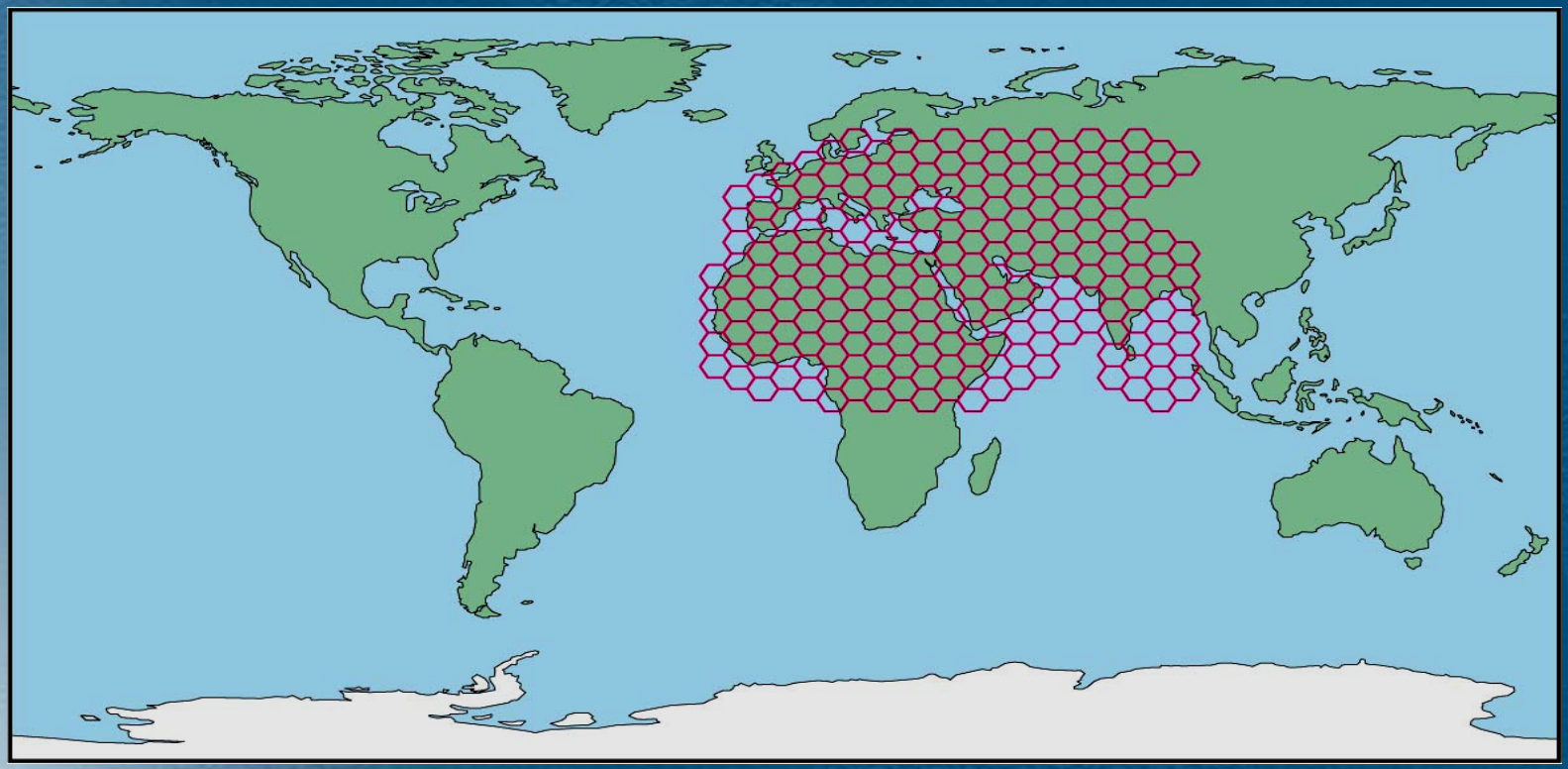
Regional BGAN Coverage



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Regional BGAN

- Up to 100 channels leased from Thuraya – 156 Khz each, directable to any of their 150+ spot beams
- 144 kbps to and from a 3 lb. laptop size terminal costing less than $1500 with airtime billed by the megabyte and priced in the range of $10/megabyte
- Terrestrial IP interface is an Inmarsat facility in Italy
- Hughes Network Systems as turnkey contractor
- Underway since July 2000; service delivery November 2002

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What does it give me?

- Fast connection to the Internet
- Fast connection to an intranet
  - Therefore email, web, etc.
- Data only (no voice)

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The satellite modem (UT/MSU)

- Size and weight of a notebook computer
- Battery life: comparable to PC
- Connections to PC etc:
  - USB
  - Bluetooth
  - Ethernet
- Built-in GPS
- Optional accessories incl. external antenna, charger, spare batteries

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The Evolution in User Terminals

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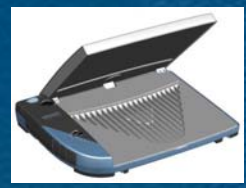

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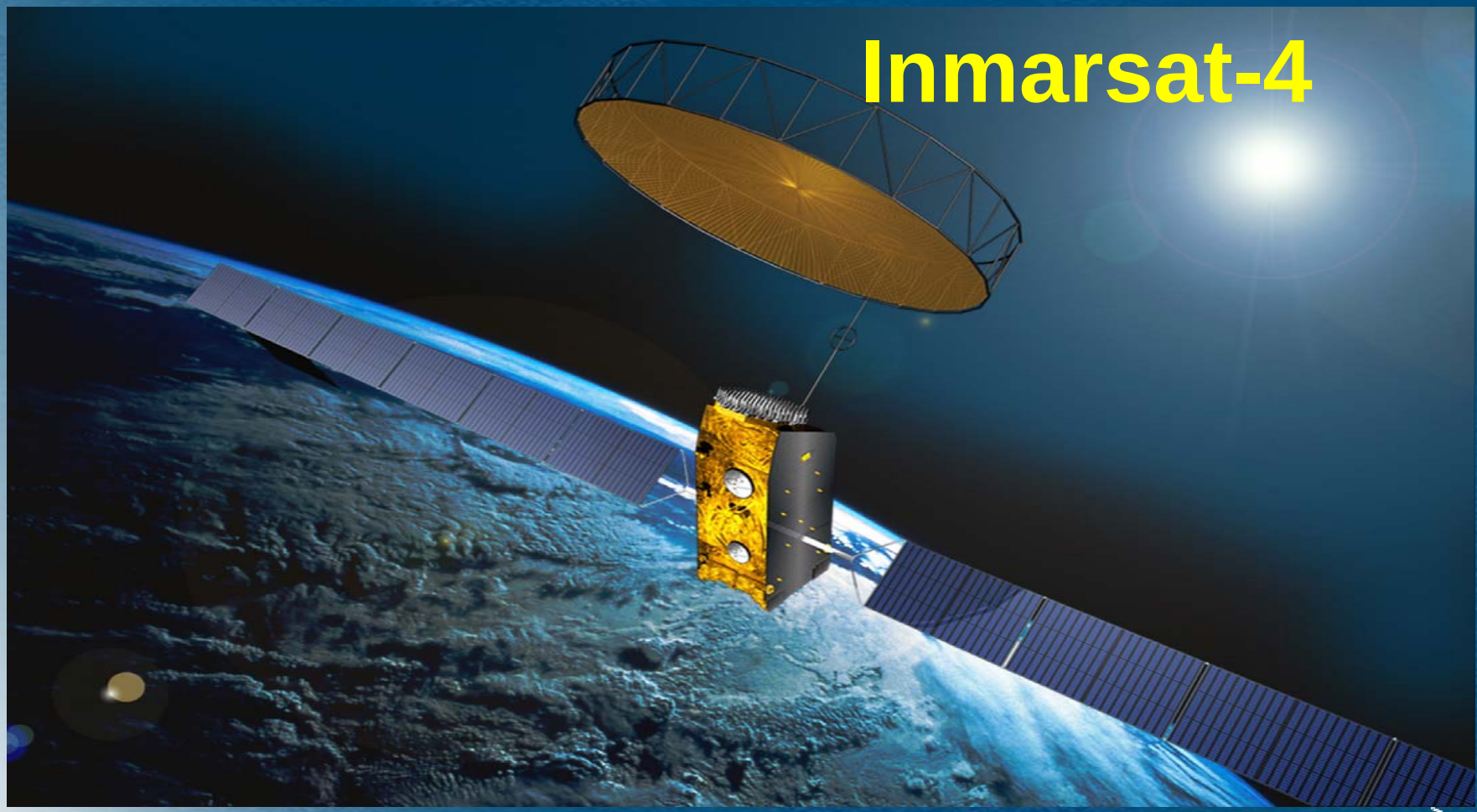
The Largest Commercial Spacecraft Ever Built!



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Inmarsat BGAN System

- Will become operational in 2005 and will support:
  - Packed switched services up to 432kbps.
  - Circuit switch services up to 64 kbps.
  - Two satellites will be launched initially providing these services through 200+ spot beams to cover a majority of the earth's landmass.
  - The BGAN ground network is accessed through 2 (plus backup) Satellite Access Stations (SAS).
  - BGAN is an IP based data service.

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Programme Implementation

- BGAN system:
  - Space Segment:
    - 3 Inmarsat-4 satellites (including one ground spare)
  - Ground Network
    - New Satellite Access Stations; Business Support System, upgrades to NOC and SCC
  - User Segment:
    - New BGAN products and evolution of existing products
- Evolution of Inmarsat system as natural extension of terrestrial fixed and mobile networks
- Align our network with evolving terrestrial mobile standards
  - **2nd (GPRS/EDGE) and 3rd Gen (UMTS/IMT2000)**

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Inmarsat-4 F1 Payload

Network Operations Facilities

Inmarsat also has two Network Operations Centres

- Prime Centre located in London

- Backup Centre outside London

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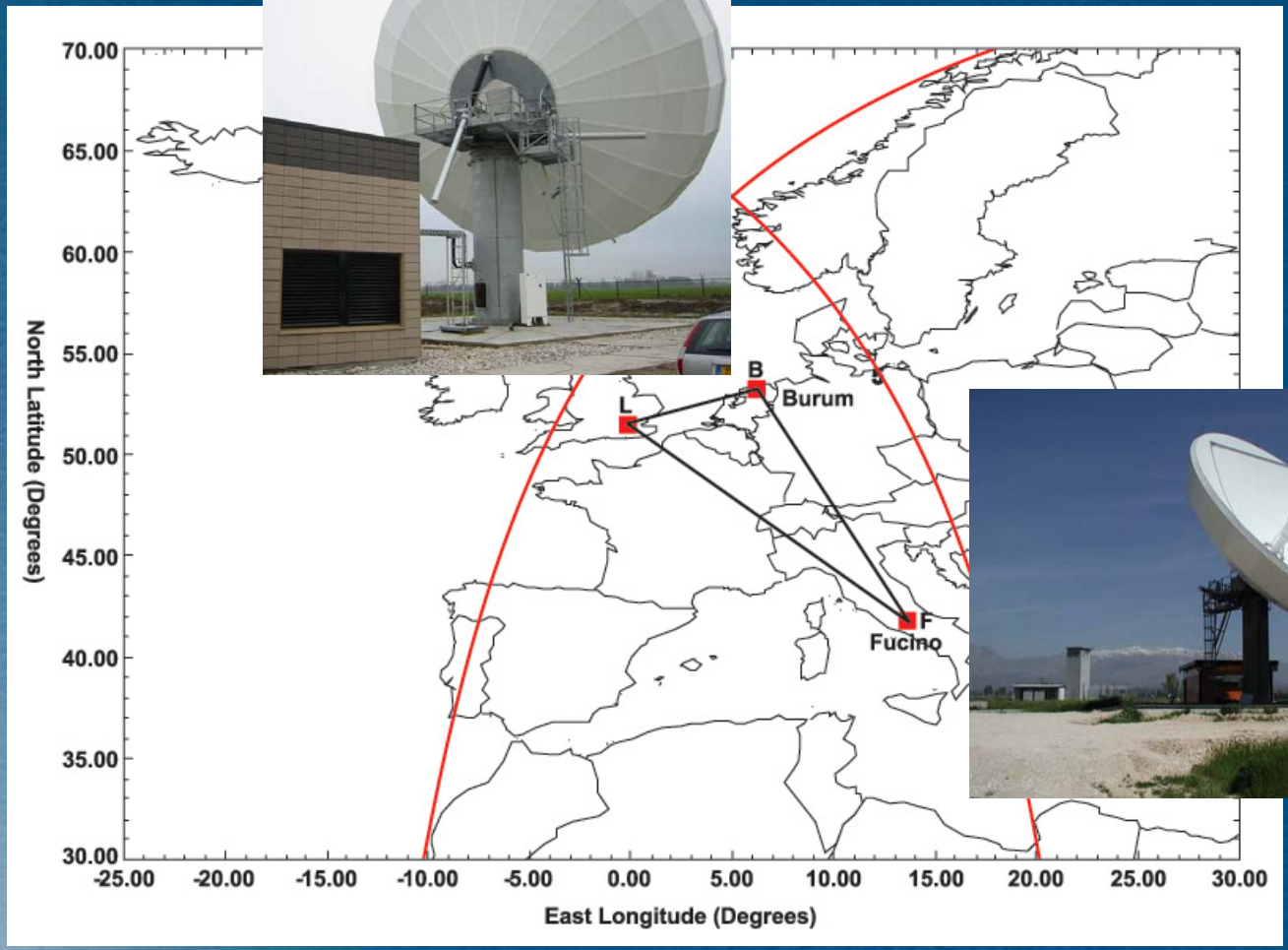
BGAN SAS Site Locations



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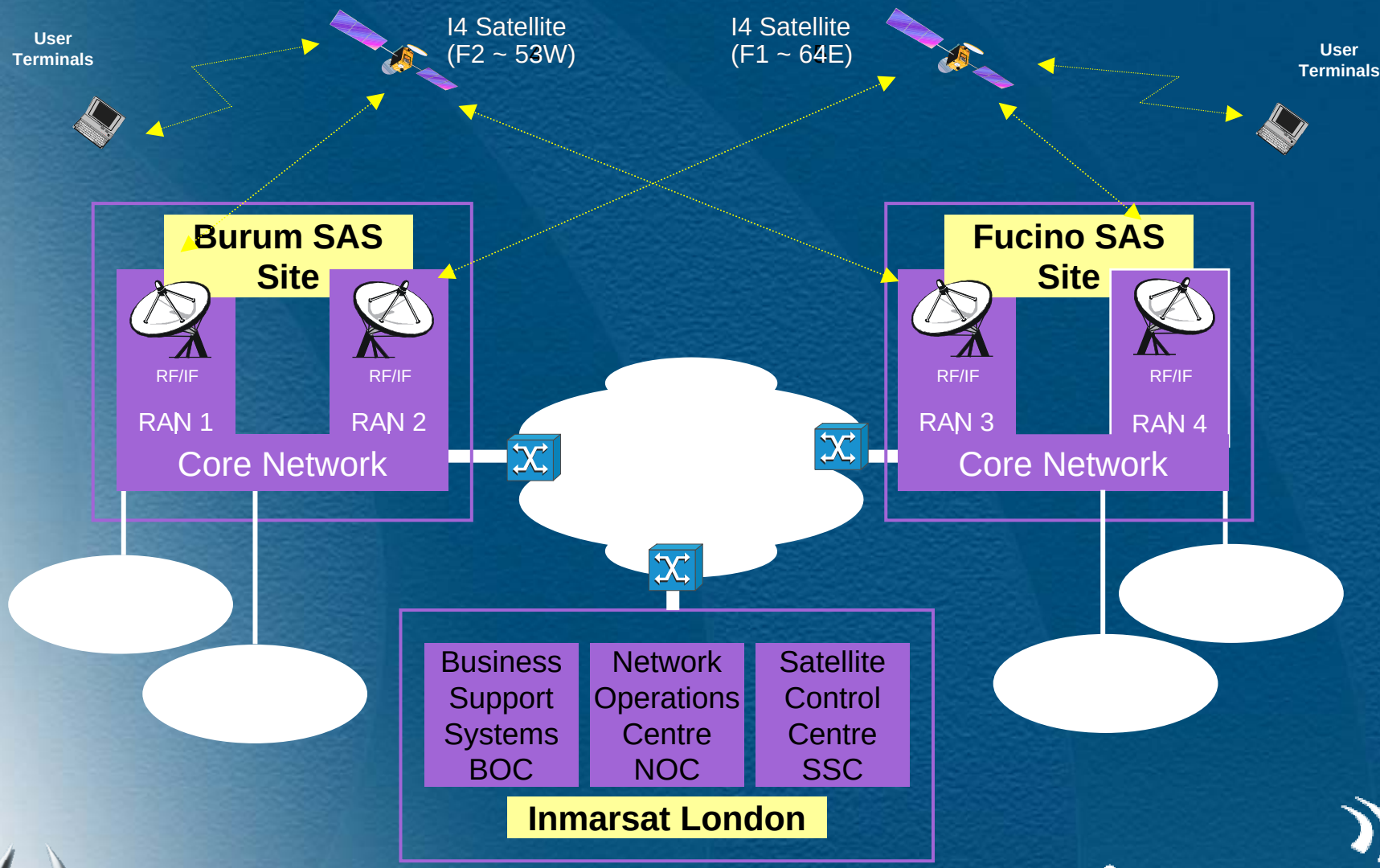
BGAN Ground Network



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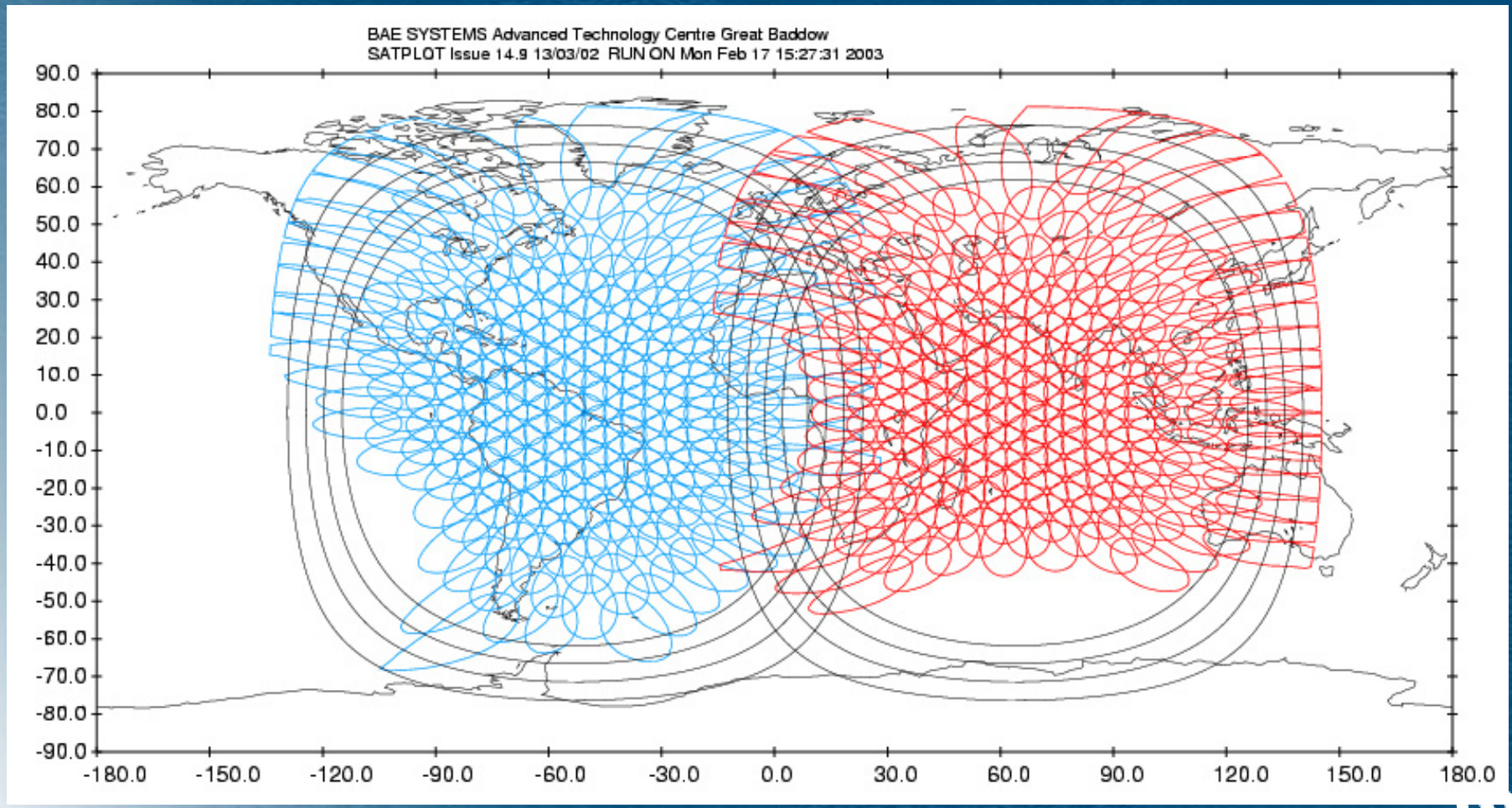
228 Beams & Minimum Overlap



Hughes Network Systems Inc

- A4 + size
- Class 1 - 6 Patch Ante
- 2.25 kg
- ISDN 64kbps , Voice 4kbps
- IP data 432kbps/432kbps – Streaming Class Option
- Ethernet, USB, in built WiFi Hub (multi user)
- IP 55 Environmental – ‘Land Rover’ spec
- Alloy bracket available for secure, semi

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Nera Satcom

- A5 size – Small and Compact
- Class 3 - Single Patch Antenn
- Lightweight > 1kg
- Geared to travelling business user
- IP data 216kbps downstream , 72kbps upstream
- Voice (4kbps) via peripheral handset
- USB, Bluetooth connectivity options
- IP 44 Environmental
- Targeted at developed markets and

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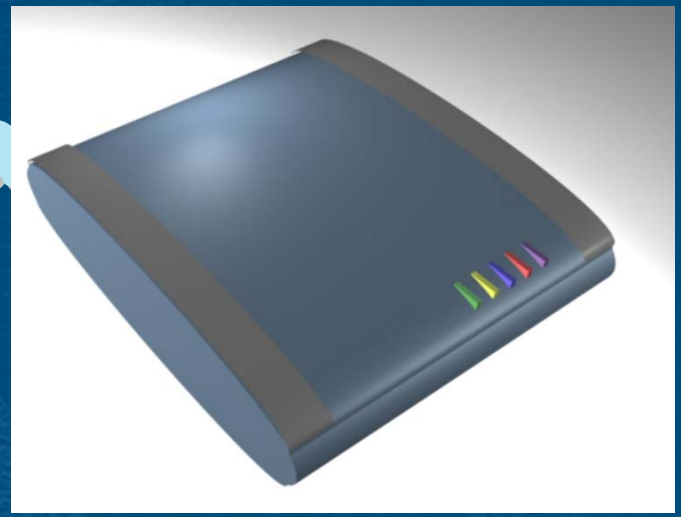

- A4 size – Compact and Portable
- 1.5kg
- IP data 432kbp downstream and 144kbps upstream
- Voice (4kbps) via Bluetooth handset
- Ethernet, USB and Bluetooth connectivity options
- IP 44 Environmental
- Targeted at higher data rate users, demanding maximum portability

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Add Value

- A5+ Size – Simple Spec
- < 1Kg
- Voice (4kbps) with RJ11 conn.
- USB wired connection only
- IP data 216kbps downstream and 72kbps upstream
- IP 42 Environmental
- Low cost, entry level device

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Conclusions

- Inmarsat has a long and successful history in the procurement and operation of communications satellites.
- The Inmarsat 4 satellites incorporate leading edge spot beam and transponder channelisation technology and will enable Inmarsat to develop exciting new products and services via the BGAN system
- Existing Inmarsat services will also be supported on the new Inmarsat-4 satellites
- The BGAN system comprises a new 'state of the art' communications network to deliver the advanced voice and data services and supplementary features
- A range of new BGAN products are under development and will enable users to choose between

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Questons?

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