Overview of Inmarsat Today

• Leading global mobile satellite communications service provider
  – Data and voice to maritime, land and aeronautical users
  – 23 years of market, technical and regulatory experience
    • Established in 1979 as an international co-operative
    • Service on leased satellites beginning in 1982
    • Satellite operator since 1990
    • Privatised as a United Kingdom entity in April 1999
  – 9 successful satellite launches (Inmarsat-2 and Inmarsat-3 fleets); all satellites still fully operational
  – More than 260,000 registered terminals
Current Portfolio of Services

Circuit switched:
- **Inmarsat-A**: tel, fax, 64 kbit/s data
- **Inmarsat-B** (digital replacement to A)
- **Inmarsat-M/mini-M**: tel., fax, 2.4 kbit/s data
  - Inmarsat Aero miniM
- **Inmarsat Aero I / H**: tel., fax, 2.4 / 4.8 kbit/s data
- **Inmarsat GAN ISDN**: tel, fax, ISDN (64 kb/s 1B+S)
- **Fleet 77/Swift 64**: tel, fax, ISDN

Messaging/ Packet based, data services:
- **Inmarsat-C**: low bit rate S/F messaging
  - Inmarsat Aero C
- **Inmarsat-D/D+**: two way paging system
- **Inmarsat Aero L / H**: 0.6 / 10.5 kbit/s packet data (X.25)
- **Inmarsat E**: distress alert service for maritime
- **Inmarsat GAN MPDS**: 64kb/s packet data over shared bearer
- **Fleet 77** (MPDS)
Regional BGAN

- 144 kbps data services
- Via leased capacity on Thuraya satellite
- Anchored at a SAS facility in Fucino (Italy)
- Air interface based on GSM adapted to satellite usage
  - Standardised as GMR-1 by ETSI and TIA enhancing future interoperability
    - Migration path to GPRS or UMTS PS service
  - Strong resemblance to GSM in upper protocol layers allows integration of standard GSM services (SMS)
Regional BGAN Coverage Map
Regional BGAN Terminal

User terminal looks and feels like a laptop, costs about $1100, receives and transmits at 144 kbps with end-user airtime charge around $11/MByte
BGAN

- Improves upon performance of Regional BGAN
  - Full ground segment diversity (Holland and Italian SASs)
  - Voice and data services supported
  - Higher data rates (up to 432 kbps)
  - Increased coverage (US, Europe, Far East)
- Two Inmarsat 4 satellites
  - 53°W and 64°E
  - 9 m L-band satellite antenna – generates 1° spot beams
  - Flexible DSP based payload, 630 dynamically assigned channels, digital beam forming
  - 200 kHz channels
Inmarsat-4

- User Link: L Band
- Feeder Link: C Band
- Processed Band: 2 x 126 MHz
- Spacecraft Power: 12 kW
- Launch Mass: 6 Tons
- Solar Array Span: 48 m
- Prime Contractor: Astrium
- Major Subcontractors
  - TRW Astro, L Band Reflector
  - EMS, L Band Feed
- Launchers
  - Atlas V
  - Ariane 5
L-band Beam Patterns

![Diagram showing beam patterns with Azimuth in Degrees and Elevation in Degrees axes.]

![Diagram showing beam patterns with Theta*cos(Phi) in Degrees and Theta*sin(Phi) in Degrees axes.]

Azimuth in Degrees

Elevation in Degrees

Theta*cos(Phi) in Degrees

Theta*sin(Phi) in Degrees
53 W Expanded Coverage
BGAN Services

• Basic Services – Inherently IP-based
  – Regular PSTN, ISDN and IP services
  – Internet access (including web browsing)
  – Intranet access (including virtual private networks)
  – Video Conferencing
  – Internet streaming (audio/video)
  – Data file transfer
  – E-mail and messaging (including GPRS/UMTS 2.5/3G SMS)
  – IP Facsimile
**BGAN Terminals**

- A wide range of terminal types is under development:
  - Handheld 72 kbps/16 kbps
  - Pocket 216 kbps/72 kbps
  - Notebook 432 kbps/144 kbps
  - Briefcase 432 kbps/432 kbps
  - Transportable 1 Mbps/1 Mbps
Pocket User Terminal
800 grams  22 x 14 x 3 cm
Notebook User Terminal with detachable Remote Antenna
## UT Product Matrix – Future Development

<table>
<thead>
<tr>
<th>Product</th>
<th>Lite</th>
<th>Professional</th>
<th>Vehicular</th>
<th>Maritime</th>
<th>Aero</th>
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- **Further UT developments**