Agenda

- Inmarsat – a brief overview
- I-4 Satellites & BGAN
- Government communications
- US Civil Government Sector
Inmarsat – an overview

The mobile satellite company™

Organisational transformation
- 1979: Set up as an IGO
- 1999: Became a private company
- 2005: IPO on London Stock Exchange

Leading provider of Mobile Satellite Services

Network availability 99.99%

10 satellite constellation - global coverage

Commercial life to 2020+

Strong financial growth in 2006 and 2007

Government users ~ 35+% global revenue
# Our Market Sectors

## Global coverage

<table>
<thead>
<tr>
<th>Maritime</th>
<th>Land</th>
<th>Aeronautical</th>
<th>Government</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unrivalled heritage</td>
<td>Helping transform the way users do business; eg media and live reporting via BGAN</td>
<td>Accelerating growth in HSD services from Govt &amp; Business aviation</td>
<td>Focus on interoperability</td>
</tr>
<tr>
<td>Continuing growth in usage and terminals</td>
<td>Only MSS provider of high-speed data</td>
<td>Current airline services focused on cockpit, but moving into cabin</td>
<td>Mobility is key</td>
</tr>
<tr>
<td>Only provider of global safety service</td>
<td>Strong take-up of next-generation services</td>
<td>Installed in &gt;80% of long-haul aircraft</td>
<td>Supports crypto devices</td>
</tr>
<tr>
<td>Long-term purchase commitments</td>
<td></td>
<td>Only ICAO compliant safety services provider</td>
<td>In use by US, UK, European, Middle East, African and AsPac forces</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>35% of global revenue</td>
</tr>
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</table>
Revenue - 9 months 2007
Solid growth

<table>
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<tr>
<th>Segment</th>
<th>9M 2006</th>
<th>9M 2007</th>
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<tbody>
<tr>
<td>Maritime</td>
<td>213.7</td>
<td>234.8</td>
</tr>
<tr>
<td>Land</td>
<td>90.0</td>
<td>97.4</td>
</tr>
<tr>
<td>Aero</td>
<td>22.4</td>
<td>32.4</td>
</tr>
<tr>
<td>Leasing</td>
<td>43.6</td>
<td>51.5</td>
</tr>
</tbody>
</table>

+$13%$

Maritime +10%
Aero +45%
Land +8%
Leasing +18%
(*) Satellite positions are always subject to change by Inmarsat
Inmarsat I-4 satellites
A step change

- Resilient, flexible, reliable, fully funded
- Network capacity can be automatically redeployed in real-time to areas of high service demand
- Supports advanced functionality of BGAN, SwiftBroadband and FleetBroadband
- Satellite launches
  - F1: 11th March 2005
  - F2: 8th November 2005
  - F3: booked Q2 2008
Inmarsat I-4 satellites
Current coverage
Inmarsat I-4 satellites
Coverage (after repositioning)
Government communications
Requirements

- global coverage
- small, light-weight
- mobile, easy-to-use
- quick to deploy
- instant connectivity
- all-weather
- high data rates
- Interoperable - IP
- comms on the move (COTM)
- information assurance
US Civil Government Sector

Current experience

- Established users
  - VIP communications
  - Embassies and consulates
  - Disaster response - FEMA
  - Specialized law enforcement activities
  - Back-up communications/continuity of government operations

- State/local level emergency communications experts are introducing BGAN into rest of civil government

- Opportunities to expand due to:
  - BGAN value proposition
  - Growing focus on mobility
  - Increasing use of wireless solutions
  - Increased recognition of terrestrial network vulnerabilities and limitations
  - International terrorism; global warming; high-profile natural disasters
BGAN Products & Services

28th February 2008

Cabinet Office / AST

Sanaa Saadani & Guy Mariz
Technical Trainers (Inmarsat Training Academy)
BGAN Products & Services

Broadband for a mobile planet ™
What is BGAN?

- Voice
- Data
- Streaming

BGAN SERVICES

- BGAN Network
- I4 Satellites
- SAS

INFRASTRUCTURE

- Satellite Terminals

BGAN DEVICES
BGAN in a nutshell…

Worlds 1st mobile communications service to offer:

- Broadband data (up to half a megabit)
- … plus voice
- accessible simultaneously
- through a single compact device
- with guaranteed data rates on-demand
- that will be available worldwide
Simultaneous voice & broadband data

- Accessible through one device
- Make a phone call while downloading email or sending live video
- Performance equal to terrestrial broadband
- Up to half a megabit data rates
- Guaranteed data rates on-demand
BGAN: One device, three networks

I-4 Satellite

Streaming IP Network
Guaranteed QoS
IP Router
HQ

Standard IP Network
Internet
IP Router
LAN

Circuit Switched Network
Switch
Voice
ISDN

BGAN Device

Satellite Access Station

Laptop or Mac

Voice & ISDN

Inmarsat confidential
Voice telephony

Direct dial landline quality voice
@ 4 kbps

All new devices support voice

Call to and from
Terrestrial networks
Mobile networks
BGAN to BGAN

Accessible via a peripheral handset
Voice telephony continued…

As BGAN is essentially a 3G network it can offer the same supplementary value-added services we use everyday when using our mobile telephones:

- Caller ID
- Call Holding
- Call Waiting
- Call Forwarding
- Call Barring
Circuit-switched ISDN (Data, Voice & Fax)

- Supported by selected user terminals

- One 64 Kbps ISDN channel

- System will support one circuit switched service at any one time

- Supports legacy 64 kbps voice encryption devices e.g. STE, STU
SMS and Voice Mail

Short Messaging Services (Text)
- To/from other BGAN terminals
- To/from terrestrial cellular networks (subject to commercial agreements)
- Using LaunchPad or handset with SMS functionality

Voice Mail Service
- SMS notification
BGAN Numbers for Circuit Switched Services

**MS-ISDN**
- Voice: +870 77 21 {12345}
- Text: +870 77 21 {12345}

**AMS-ISDN**
- ISDN: +870 78 21 {12345}
- FAX: +870 78 21 {12345}

**MSISDN** = Mobile System International Integrated System Digital Network Number
**AMSISDN** = Additional Mobile System International Integrated System Digital Network Number

Inmarsat confidential
Two BGAN IP Services

Standard IP
 Chased by Volume

Streaming IP
 Chased by Time
Standard IP Service (Background Class)

- Up to 492 Kbps via shared channel
- Dynamically assigned by the network on demand
- User pays for amount of data sent and received per MB
- Suitable for e-mail, messenger, file transfer, internet, corporate/intranet access. Your everyday applications…
Streaming IP Service (BGAN QoS)

- Guaranteed data rates of
  32, 64, 128, 256 Kbps (symmetrically)

- Selected by user, as and when required

- User pays for duration of connection (per minute)

- Suitable for Live video, Live audio, VoIP or data heavy applications
BGAN best practice

- Standard IP – e.g. e-mail, web, ftp
- Bigger pipe
- Packet retransmission intrinsic in protocol
- **Emphasis on accuracy rather than speed**

- Streaming IP – e.g. Quicktime, WinMedia, Livewire
- Dedicated connection
- No retransmission
- **Emphasis on speed of transmission**
Multiple connections from one device

- The first connection can be set up as a Standard IP (this is the default) or Streaming IP
- All application traffic is shared across this connection
- A second ‘customised' Streaming Connection can then be set up to carry a specific application type
- This is called a Dedicated connection in the BGAN LaunchPad
- A Dedicated connection will not be used for any other applications other than the one specified
### What BGAN can do...

| Data                      | - Standard IP  
|                          | - Variable bit rate service  
|                          | - Up to 492kbps (send & receive) |
| Streaming                | - Guaranteed bit rate service  
|                          | - Available on demand  
|                          | - 32, 64, 128, 256 kbps (send & receive) |
| Voice                    | - 4kbps circuit-switched service  
|                          | - Voicemail  
|                          | - Enhanced services: call waiting, forwarding, barring, holding  
|                          | - Broadcast quality voice |
| SMS/Text                 | - Send and receive text messages via your laptop |
Review & Questions?
Inmarsat 4 Satellites

Evolution   Next Generation   Beams
### Inmarsat Satellite Constellation

<table>
<thead>
<tr>
<th></th>
<th>Inmarsat-2</th>
<th>Inmarsat-3</th>
<th>Inmarsat-4</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>No. Satellites</strong></td>
<td>3</td>
<td>5</td>
<td>2 + 1</td>
</tr>
<tr>
<td><strong>Coverage</strong></td>
<td>1 Global Beam</td>
<td>7 Wide Spots 1 Global Beam</td>
<td>Up to 236 Narrow Spots 19 Wide Spots 1 Global Beam</td>
</tr>
<tr>
<td><strong>Mobile Link EIRP</strong></td>
<td>39 dBW</td>
<td>49 dBW</td>
<td>67 dBW</td>
</tr>
<tr>
<td><strong>Channelisation</strong></td>
<td>4 channels (4.5 to 7.3 MHz)</td>
<td>46 channels (0.9 to 2.2 MHz)</td>
<td>630 channels (200 KHz)</td>
</tr>
<tr>
<td><strong>S/C Launch Mass</strong></td>
<td>1500 kg</td>
<td>2050 kg</td>
<td>5959 kg</td>
</tr>
<tr>
<td><strong>Solar Array Span</strong></td>
<td>14.5m</td>
<td>20.7m</td>
<td>45m</td>
</tr>
<tr>
<td><strong>Voice (4.8kbps)</strong></td>
<td>250</td>
<td>1000</td>
<td>18000</td>
</tr>
<tr>
<td><strong>M4 (64 kbps)</strong></td>
<td>N/A</td>
<td>200</td>
<td>2250</td>
</tr>
<tr>
<td><strong>BGAN (432kbps)</strong></td>
<td>N/A</td>
<td>N/A</td>
<td>&gt;600 channels</td>
</tr>
</tbody>
</table>

EIRP = Effective Isotropic Radiated Power
A new generation of satellites - I-4

- The most advanced commercial satellites ever launched
  - 16 x capacity of I-3
  - 60 x power of I-3

- Network capacity can be redeployed real-time to areas of high service demand

- Service life until 2023

- Satellite launches
  - F1: 11.03.05
  - F2: 08.11.05
  - F3: Q1 2008 (TBC)
Inmarsat-4: Satellites and Services

- User Link: L Band
- Feeder Link: C Band
- Spacecraft Power: 12 kW
- Launch Mass: 6 Tons
- Prime Contractor: Astrium
- Launchers
  - Atlas V
  - Sealaunch
Inmarsat 4 Satellite
I-4 F3 Preparations
Benefits of I-4’s

- Cost efficient delivery to our customers of Broadband and Streaming IP
- I-4s increase network capacity by 16 times over I-3s
  Network availability increased even further to more users
- Dependable, peace-of-mind communications
- Extended satellite lifetime to over 15 years
- More powerful means smaller satellite terminals
- Improved resource management
  Delivery of service to hotspots when you need it
- Reliability
Review & Questions?
Spot Beams

Coverage

Global Beams
Wide Beams
Narrow Beams

The Connection
Current Global Service Coverage Area
Global mobile broadband coverage

Launch of 3rd satellite  
March/April 2008

Together the first two I-4 satellites currently service about 85 per cent of the world’s landmass, which is around 98% of the global population

3rd Satellite will increase coverage to 99.9% of the global population
I-4 Satellite beam hierarchy and functions

Switch on terminal

Pointing

Receive SIB in Global Beam

Select Beam

Idle in Regional Beam

Traffic in Narrow Beam

I-4 Satellite

Global Beam

19 Regional Beams

228 Narrow Beams

Feeder Link

User Link

SAS
Accessing BGAN is simple and automated
Access is easy, efficient and automated

1. Obtain GPS Fix
2. Tune into the Global Beam
3. Connect to nearest Wide Beam and register
4. Narrow Spot Beam will be allocated (when traffic flow begins)
Review & Questions?
Primary BGAN Ground Antenna’s ’Burum’
Secondary BGAN Antenna’s in the heart of Italy ‘Fucino’
The BGAN Radio Access Network (RAN)
## Benefits of BGAN infrastructure

<table>
<thead>
<tr>
<th>Benefit</th>
<th>✔️</th>
</tr>
</thead>
<tbody>
<tr>
<td>Service to customers where and when needed</td>
<td></td>
</tr>
<tr>
<td>Resilience from two sites</td>
<td></td>
</tr>
<tr>
<td>Efficient use of spectrum-Increase capacity</td>
<td></td>
</tr>
<tr>
<td>Availability across 85% landmass, reaching 98% world's population</td>
<td></td>
</tr>
<tr>
<td>Cost reduction</td>
<td></td>
</tr>
</tbody>
</table>
Review & Questions?
Satellite Terminal Overview
The Devices
Choosing the right BGAN device for your solution

Size? Weight? Environmental protection?
- Find which terminal best fulfils your requirements

What applications will you be using? What interfaces?
- Voice: VOIP handsets, Bluetooth, ISDN handset
- Shared data: Routers, Switches, Ethernet-based devices
- Single-User/Multi-user interfaces, WiFi

Desired Performance?
- Upload and/or Download speed requirements

Will you require streaming connections?
- 32, 64, 128 or 256Kbps
A common user interface - The BGAN LaunchPad
Thrane & Thrane

High bandwidth, highly portable device

Size 217 x 217 x 52 mm
Weight <1.5 Kg
Standard IP Service Up to 464/448kbps (receive/send)
Streaming IP service 32, 64, 128kbps (send & receive)
ISDN Via USB
Voice Via RJ11 or Bluetooth handset; 3.1khz audio
Data interfaces USB, Bluetooth, Ethernet
Environmental Tolerance IP 54
Target markets Mobile use / semi-fixed use
Thrane & Thrane

Explorer 500

Bluetooth Laptop

Via Ethernet

Via USB

G3 Fax via RJ11

PSTN via RJ 11

Bluesooth Handset

Bluetooth PDA

Via Ethernet
Inmarsat Services: What’s next?

- The BGAN-X (BGAN Extension) programme is ongoing to upgrade ground network and enable 6 new user terminal types:
  - 2 new Aeronautical terminal types (Swift Broadband)
  - 2 new Maritime User Terminals (Fleet Broadband)
  - 2 new Directional Land Vehicular Terminals (BGAN)

- Other exciting services like multicast, broadcast and new devices like hand-held terminals are in the pipeline…

- The 3rd I-4 satellite will be launched for Worldwide Coverage and Hawaii will become a new SAS Site

- GSPS Service
What you now know about BGAN…

The 1st mobile satellite service to offer:

- Broadband **Data** (up to 492Kbps)
- plus **Voice** simultaneously
- **SMS** and **Voice Mail**, **ISDN**
- **Standard IP** and **Streaming IP** connections with on demand **Guaranteed Data Rates**
- Using a variety of **purpose designed Satellite Terminals** and a secure and stable (99.9%) BGAN network
- Soon available **globally**
Broadband for a mobile planet™
Review & Questions?