


Inmarsat Update & I-4 'The Next Generation'

Digital Ship Scandinavia 16th March 2005



Piers Cunningham
Head of Maritime Market Management - Inmarsat




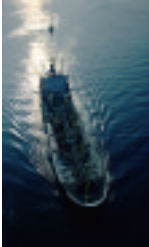
USCGC SHEARWATER & HURRICANE ISOBEL

"With VHF & HF sites down & spotty (at best) cell coverage, Inmarsat was the only way to go!"

- Master Chief William 'Bill' James





Inmarsat Fleet Service Enhancements To Date

- Over 4,800 Fleet terminals now active globally
- Fleet F33 integrated modem compression*
- Fleet F33 MPDS – introduced March 2004
- Call Waiting* – Network Enhancements complete, awaiting LESO rollout
- Fleet F77/F55 G3 Fax* – Now widely available
- Fleet SIM Card functionality* – Rollout through specified vendors

* Optional feature only, requires participating hardware and airtime vendors






Fleet F77 128Kbit/s


- Announced SMM, Sept 2004
- Commercially Available Now

Main specification elements:

- Dedicated 128K channel (not 2X64K bonded)
- Uses existing F77 hardware
- 128K ISDN applications will function
- Spot-beam only service until I-4: Under I-4 wide spots will be used

Fleet F77 128kbit/s




F77 128K Features:


- Full ISDN functionality (~2B+S*)
- Compatible with standard 128K applications (H320 etc)
- Upgrades planned from F77 manufacturers
 - Either software, or software plus hardware upgrade required - See manufacturer for further details

Advantages / Benefits:

- Reduces cost of vessel's fixed datacomms requirements
- Increases performance
- Increases availability of terminal, less time tied up





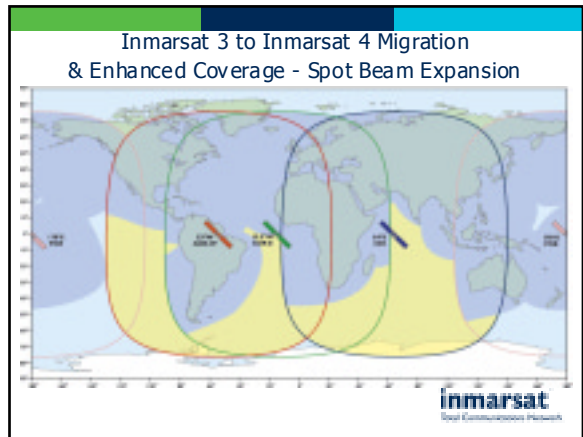
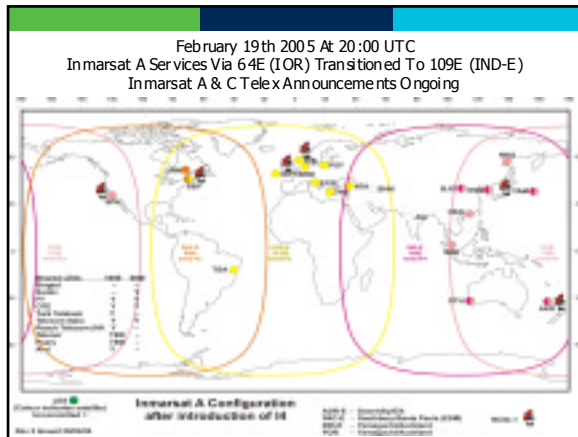
Inmarsat Service Revisions



- Inmarsat A closure date remains 31 December 2007
- Inmarsat E retirement announced
 - L-band EPIRB Service to be halted end 2006
 - Inmarsat E users will be offered provision of alternative EPIRB, free of charge during 2006
 - Inmarsat E+ project halted

See: www.inmarsat.com

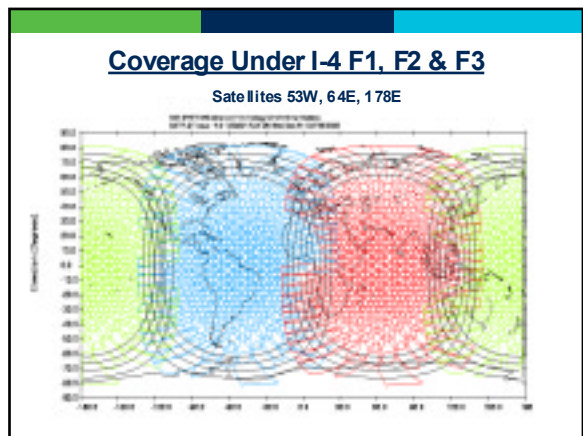


I-4 Enhanced Coverage Available End Q2 (IOR) & End Q4 (AOR-W)2005

- Strengthens Inmarsat competitive position for maritime services
- Applies to Spot-Beam Services:
 - Mini-M
 - F33 Fax and Data
 - F55 Fax and Data
 - F77 128Kbps ISDN
- Addresses key coverage requirements, e.g.:
 - Significant maritime IOR service improvement
 - Coverage "gap" off Equator resolved
- Automated: no user actions required at the terminal

Legend:

- 64E (IOR) - Inmarsat A
- 109E (IND-E) - Inmarsat A
- 109E (IND-E) - Inmarsat C
- 109E (IND-E) - Inmarsat B
- 109E (IND-E) - Inmarsat E
- 109E (IND-E) - Inmarsat F
- 109E (IND-E) - Inmarsat G
- 109E (IND-E) - Inmarsat H
- 109E (IND-E) - Inmarsat I
- 109E (IND-E) - Inmarsat J
- 109E (IND-E) - Inmarsat K
- 109E (IND-E) - Inmarsat L
- 109E (IND-E) - Inmarsat M
- 109E (IND-E) - Inmarsat N
- 109E (IND-E) - Inmarsat O
- 109E (IND-E) - Inmarsat P
- 109E (IND-E) - Inmarsat Q
- 109E (IND-E) - Inmarsat R
- 109E (IND-E) - Inmarsat S
- 109E (IND-E) - Inmarsat T
- 109E (IND-E) - Inmarsat U
- 109E (IND-E) - Inmarsat V
- 109E (IND-E) - Inmarsat W
- 109E (IND-E) - Inmarsat X
- 109E (IND-E) - Inmarsat Y
- 109E (IND-E) - Inmarsat Z



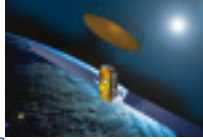
Directional Maritime BGAN Proposed Services

- Voice
- Fax
- 64Kbps ISDN SCPC data
- Up to 432Kbps Packet data
- Simultaneous Voice & IP Data
- Multicast Expansion Potential
- Potential BDU upgrade for existing Fleet users



What the I-4 Programme Represents

- I-4 represents a new era for Inmarsat
- Largest, most powerful commercial satellites ever built
 - Weight 6 tons at lift-off
 - Solar arrays spanning 45m
 - Provide 60 times more power than their I-3 predecessors
- Reinforces Inmarsat's commitment and its position as a world leading satellite communications provider
- I-4 enables Inmarsat to offer more affordable satellite communications than ever before
- Opens up access to broadband to new geographical and industry markets
- The I-4 satellites will propel a whole new generation of broadband mobile satellite services into the market

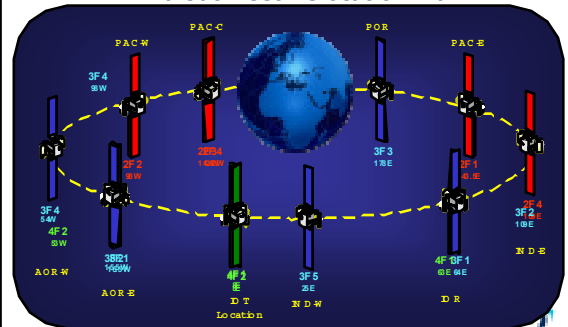


Inmarsat Satellites - Characteristics

	Inmarsat-2	Inmarsat-3	Inmarsat-4
No. of Satellites	4	4+1 spare	3 (inc. 1 Spare)
Coverage	Global Beam	7 Wide Spots + Global Beam	200 Narrow Spots + 19 Wide Spots + Global Beam
Mobile link EIRP	39 dBW	49 dBW	67 dBW
Channelisation	4 Channels between 4.5 & 7.3 MHz Bandwidth	46 Channels between 0.9 & 2.2 MHz Bandwidth	630 Channels at 200 kHz
Solar Array Span	14.5 m	20.7 m	48.0 m
Satellite Dry Mass	700 kg	1000 kg	3000 kg
Total Launch Mass	1500 kg	2050 kg	6000 kg
Navigation Payload	No	Yes	Yes



Inmarsat Fleet Relocation Plan



Thanks God, it's over ...maybe... waiting for 4F3



Current Status



- I-4 F1 spacecraft successfully launched 11th March 2005 @ 21:42 Hrs GMT
- The F2 spacecraft is currently planned for delivery to the launch site by **Q3 2005**
- Inmarsat 4 has been designed and tested for compatibility with four launch vehicles: Atlas V, Sea Launch 6000, Ariane 5 and Proton M/BM
- Launch services have been contracted from International Launch Services (ILS) for Atlas V and Boeing Launch Services for Sea Launch 6000



Inmarsat Ltd Satellite Control London



Just Arrived - Space Shuttle Landing Facility



**Spacecraft Being Extracted From The Antonov
(Does Anyone Have A Shoe Horn?)**



Spacecraft + Container = 20 Tonnes



**Atlas V Before Solid Rocket Boosters Installation
(Height With Fairing Installed Is 59.2 Metres)**



**Two (of Three) Solid Rocket Boosters After
Installation Onto The Main Core Booster**



**Noise Suppression System
(You Can't Hear Under Water !)**



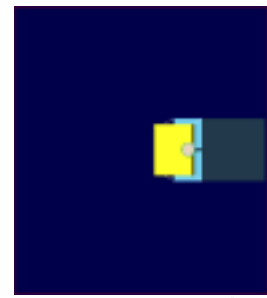
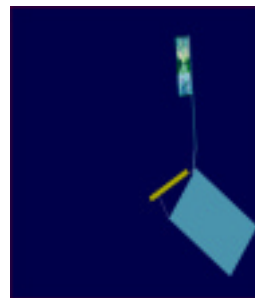
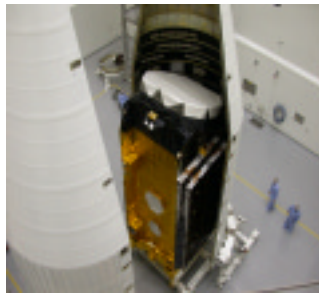
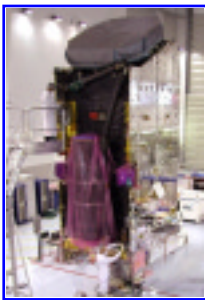
The Atlas V Launch Pad & Hanger



The Journey To The Launch Pad



The Final Check !



300 Tonnes Of Liquid Propellant Loaded In Few Hours

'It would take approximately 15 days, of continuous pumping, to load the same amount of propellant at your local petrol station !'




Moving The Spacecraft To The Air Force Base



Watch Out, Don't Bang It !



Finally !
I-4 F1 On Top Of
Atlas V Second Stage

I-4 F1 Interesting Facts

- Atlas V rocket lift-off weight 480 tonnes
- Nominal Lift-off time 10 March @21:42z
- Flight time to separation 32 minutes
- The Super-Synchronous Transfer Orbit
 - First apogee height 90,000 Km is a quarter of the way to the Moon
 - Perigee height 400 Km
- High altitude orbits mean a long mission (11 days)
- 4F1 satellite launch mass is 5959 kg
- After 2 x AEF and 2 x PEF LAE burns, the aim is to use 2200 kg of fuel leaving 250 kg available for station keeping
- GEO Orbit - 2 Apogee and 2 Perigee burns (1Kg of Fuel Every 7 Seconds)
 - Burns 1 + 2 - 78 and 93 minutes
 - Burns 3 + 4 - 40 and 44 minutes
- Nominal lifetime is expected to be approx 18 years