



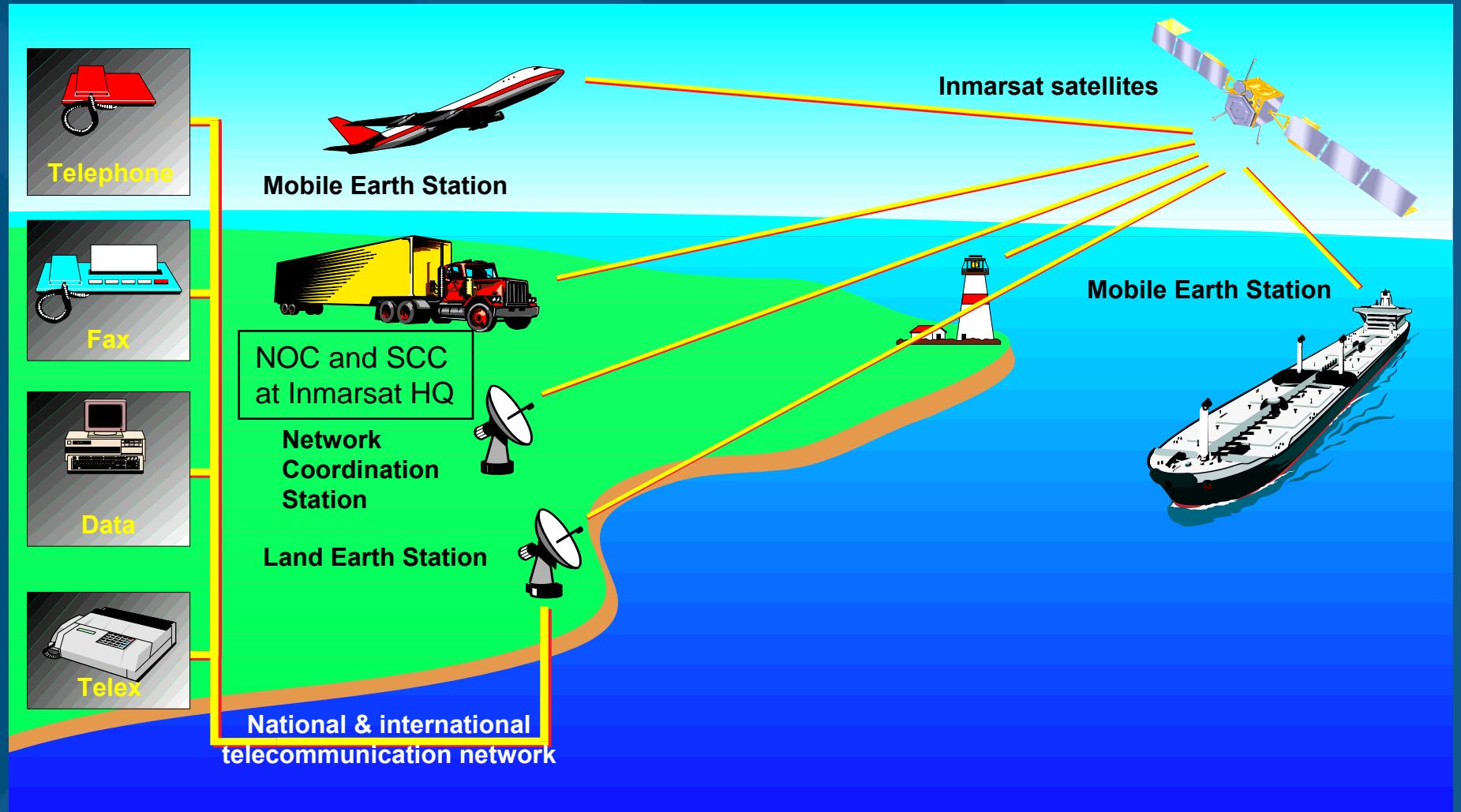
# **Inmarsat Maritime Communication Services**

**WMO International Port  
Meteorological Officers Workshop**

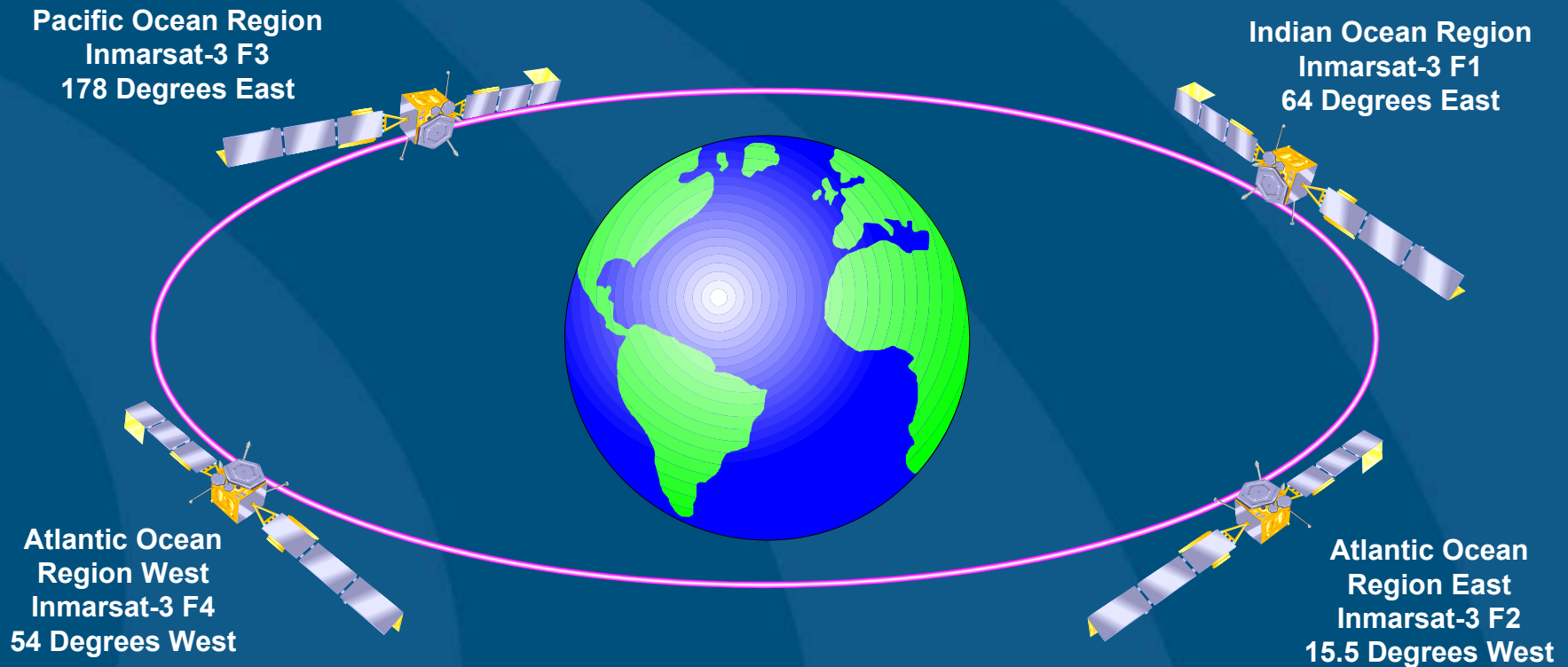
**23 July, IMO**

Vladimir Maksimov  
Manager, Maritime Safety Operations  
Maritime & Aeronautical Safety Services

# Inmarsat System Components

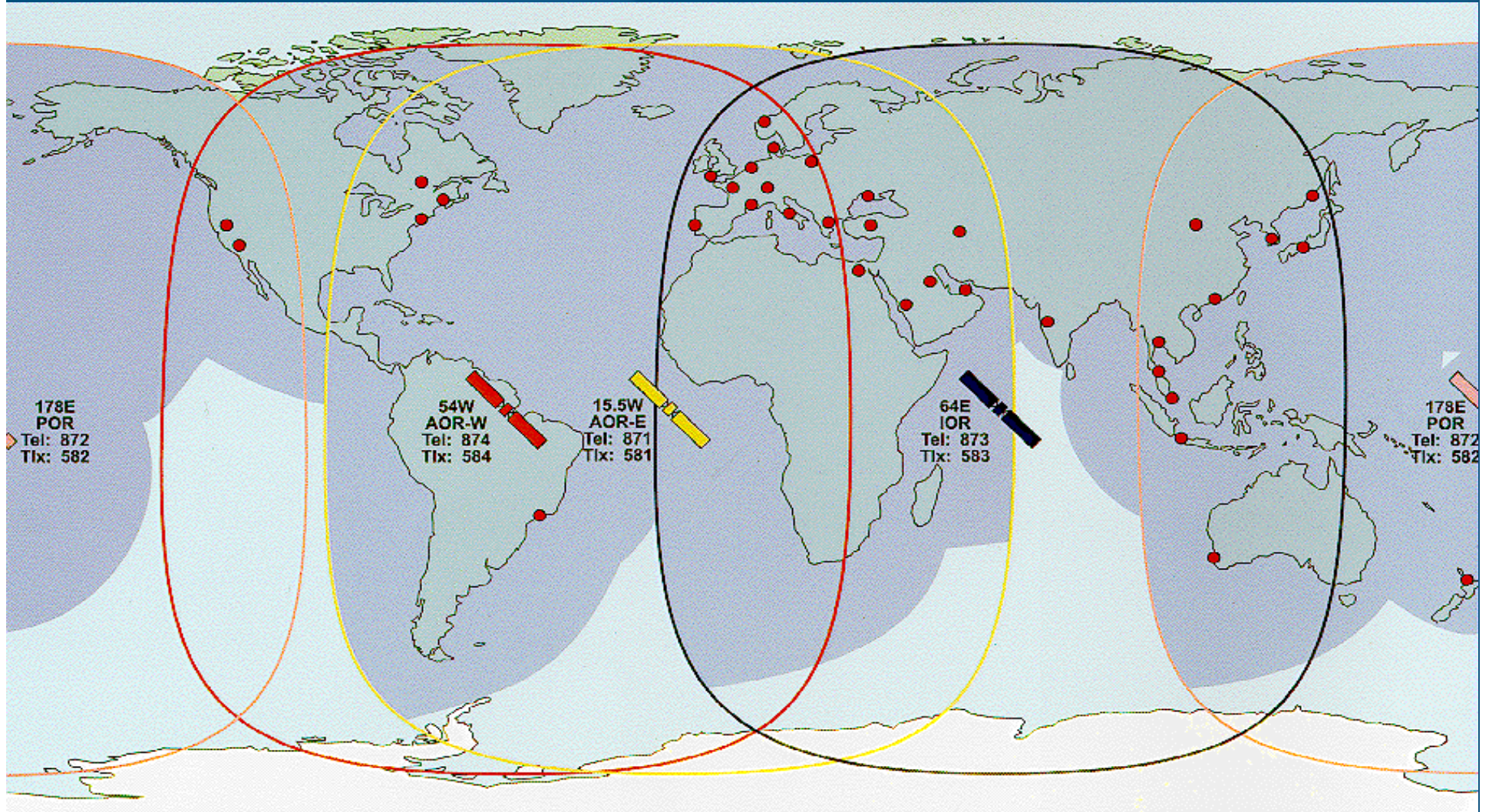


# Operational satellites



- 4 operational satellites in 4 ocean regions
- 5 spare satellites
- Geostationary orbit, 36000 km above equator
- Satellites moves at the same rate as earth, and so remains in the same position to the earth

# Inmarsat global and spot beam coverage



# What is available today for maritime communications?

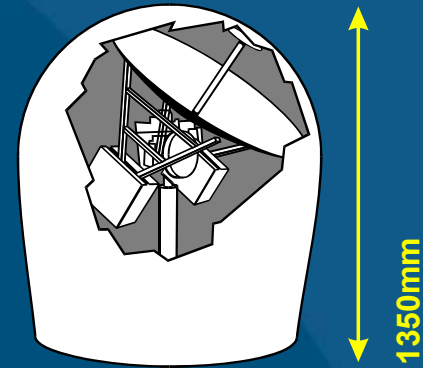
- Inmarsat A - introduced 1982
- Inmarsat C - introduced 1991
- Inmarsat B - introduced 1993
- Inmarsat mini-M - introduced 1996
- Inmarsat D/D+ - introduced 1997
- Inmarsat E - introduced 1997
- Inmarsat E+ (2003)
- Inmarsat mini-C – introduced 2002
- Inmarsat Fleet F77 – introduced 2002
- Inmarsat Fleet F33 and F55 – (Introduced April 2003)
- GMDSS compliance
  - Inmarsat A, Inmarsat B, Inmarsat C, Inmarsat E/E+, Inmarsat Fleet F77

# Inmarsat A & B SES

Size, weight & main services



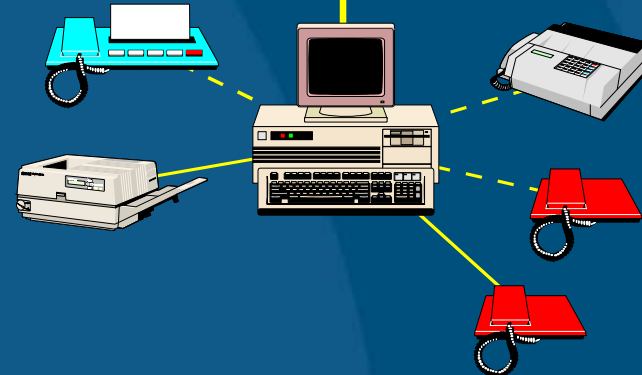
Telephone, Telex, Fax,  
Data and High Speed Data  
Distress calling



Above Deck

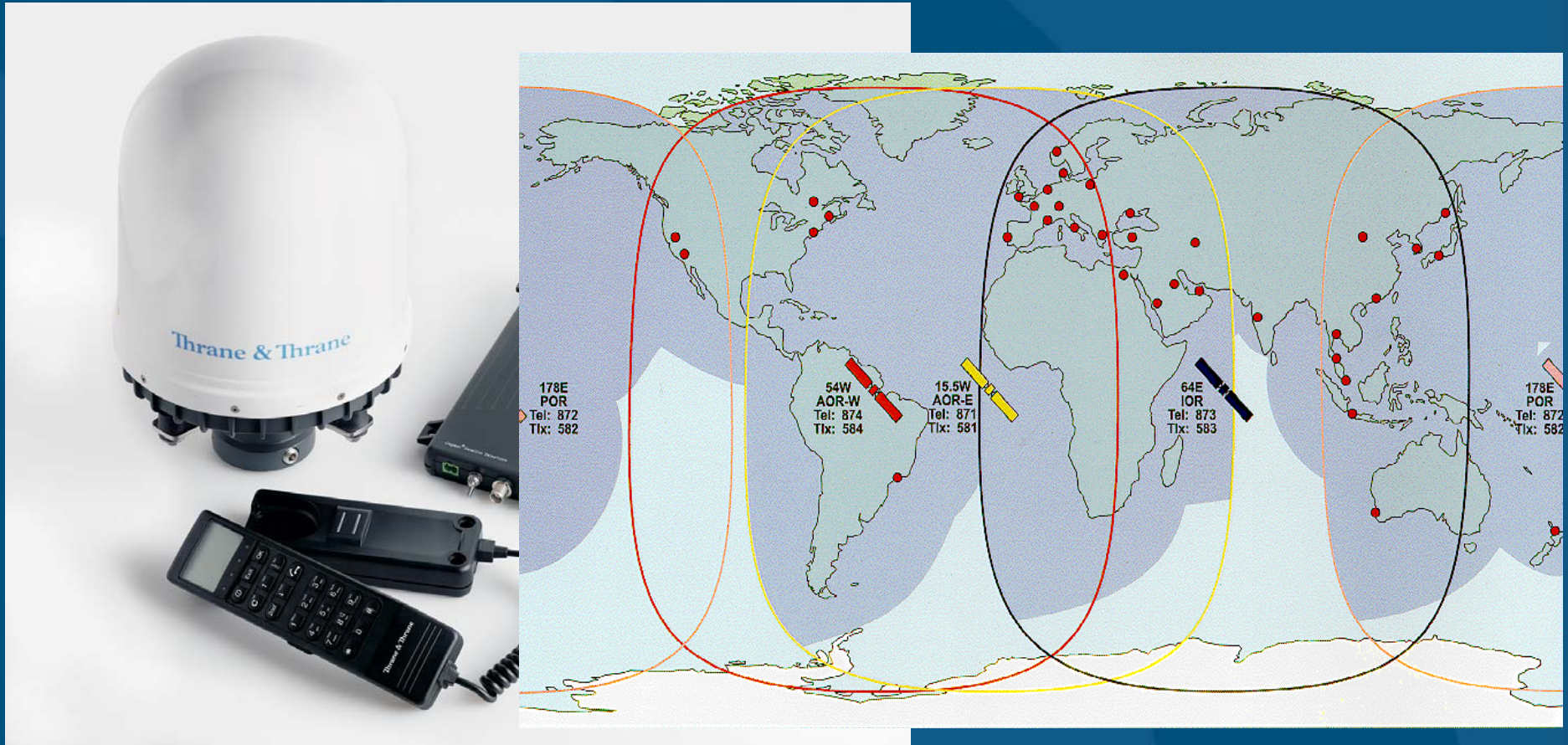
100Kg 1350mm

Below Deck



- Inmarsat A will cease operation on the 31 December 2007;
- MSC-77 circular agreed

# Inmarsat Mini-M



- Extremely compact digital maritime terminal
- Antenna approximately 21 cm in diameter, weight 2.2 kg
- Operates in spot beam (map) coverage areas only
- Provides digital Voice, Fax and data (2.4 kbps)

# Inmarsat E/E+



- - 4 geostationary satellites
- Integrated GPS receiver (accuracy within 200m)
- SAR transponder (option)
- Audio/Visual indication of transmission
- Distress Alert Delivery time ~ 5 mins, typically 1-2
- Distress Alert contains: EPIRB ID, position, course, speed, nature of distress, time of position update
- 8 CESs - 2 in each ocean region
- 4 RCCs (Germany, USA, UK, Australia)
- **Inmarsat E+ will have acknowledgement channel**
- **Inmarsat E+ is expected to be introduced globally in late 2003**



# Fleet Services Family

F77



2002

F55



2003

F33

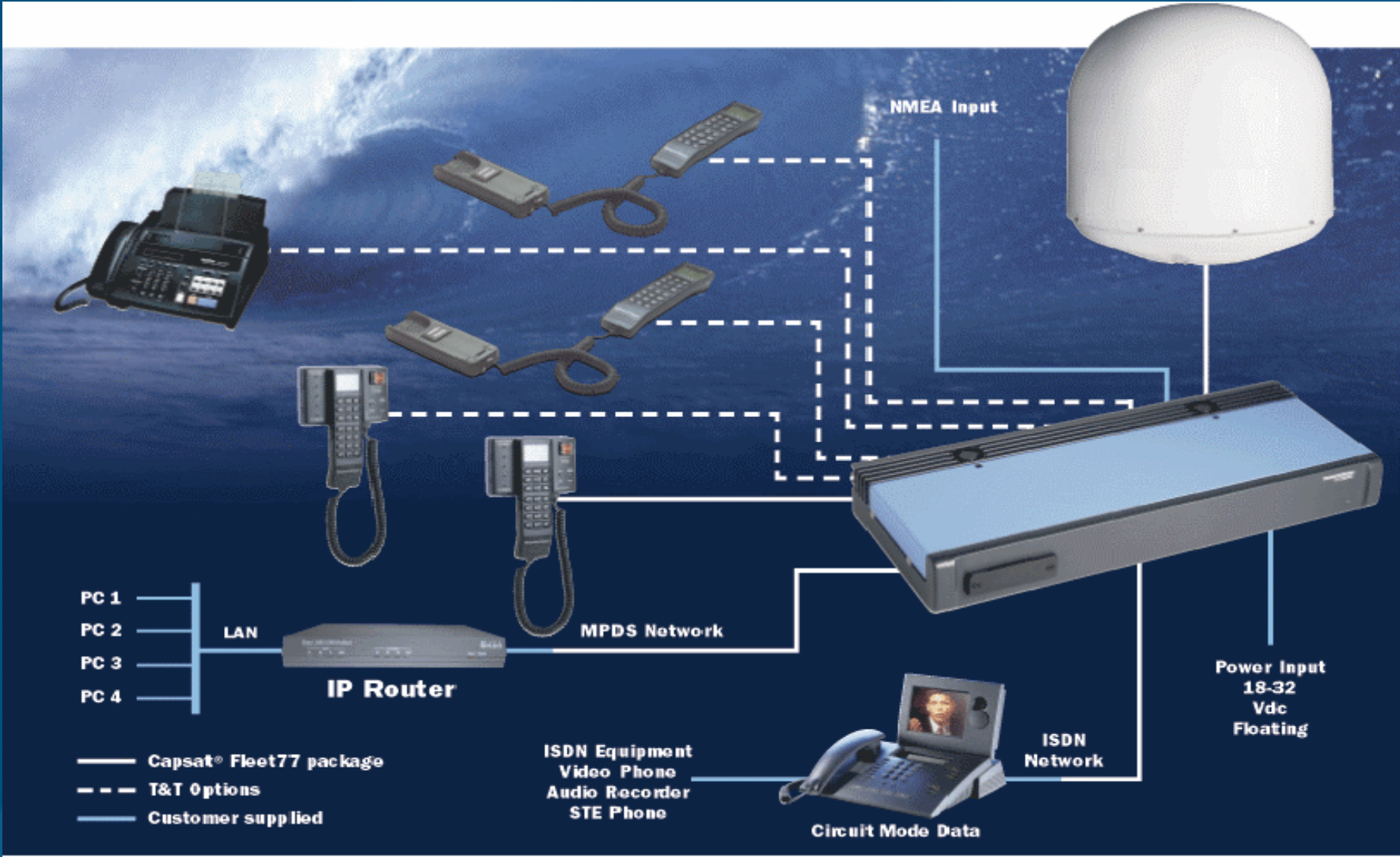


2003

SMM 2002 Exhibition, Hamburg  
23.07.03 Inmarsat Maritime Communication Services

  
inmarsat

# Inmarsat Fleet F77 MES



# Fleet F33

Service	Mandatory/Optional
Voice (mini-M) (global beam)	Mandatory
Data/fax (spot beam)	Optional
MPDS (spot beam)	Optional

In service since April 2003



# Fleet F55



- Key Differentiators from F77:
  - Regional Data only (Spot)
  - No Voice GMDSS
  - Smaller Antenna
  - Lighter Above-Decks

Service	Coverage
Voice	Global
MPDS	Spot beam
ISDN	Spot beam

In service since April 2003

# Inmarsat C MES (SOLAS compliant) (no power supply shown)



Antenna/GPS



DTE (display/keyboard)



Printer



DCE (transceiver/GPS)



Distress (SOS) button

# Inmarsat mini-C MES (no power supply shown)



**DCE/DTE (transceiver & messaging unit and GPS)**



**Personal Computer (not messaging terminal)**



**Distress (SOS) button (when service is available)**

- New compact model. Weight – 1,1 kg, height – about 15 cm

- Next model (mid-2003) will get Distress Alerting function

- Supports all Inmarsat C communication functions (no distress calling yet)

- MSC agreed that mini-C can be used for GMDSS purposes



**Printer (option for non-SOLAS)**

# Inmarsat C characteristics & maritime services



- Store and Forward communication system
  - Omnidirectional antenna
  - Small size and weight, low power consumption
  - More than 63,000 Maritime MESs
  - Compatible with national alphabets
  - Main part of the GMDSS equipment – **performs 6 functions out of 9.**
- 
- Store and Forward data and messaging to telex, fax (text, one way only), another mobile, two-digit codes (SAC), e-mail
  - Distress Calling (distress alerting and distress priority messaging)
  - Enhanced Group Calling (EGC) – SafetyNET and FleetNET
  - Data reporting and Polling - (SCADA applications, position monitoring, tracking, security)

# GMDSS Communication Functions via Satellite

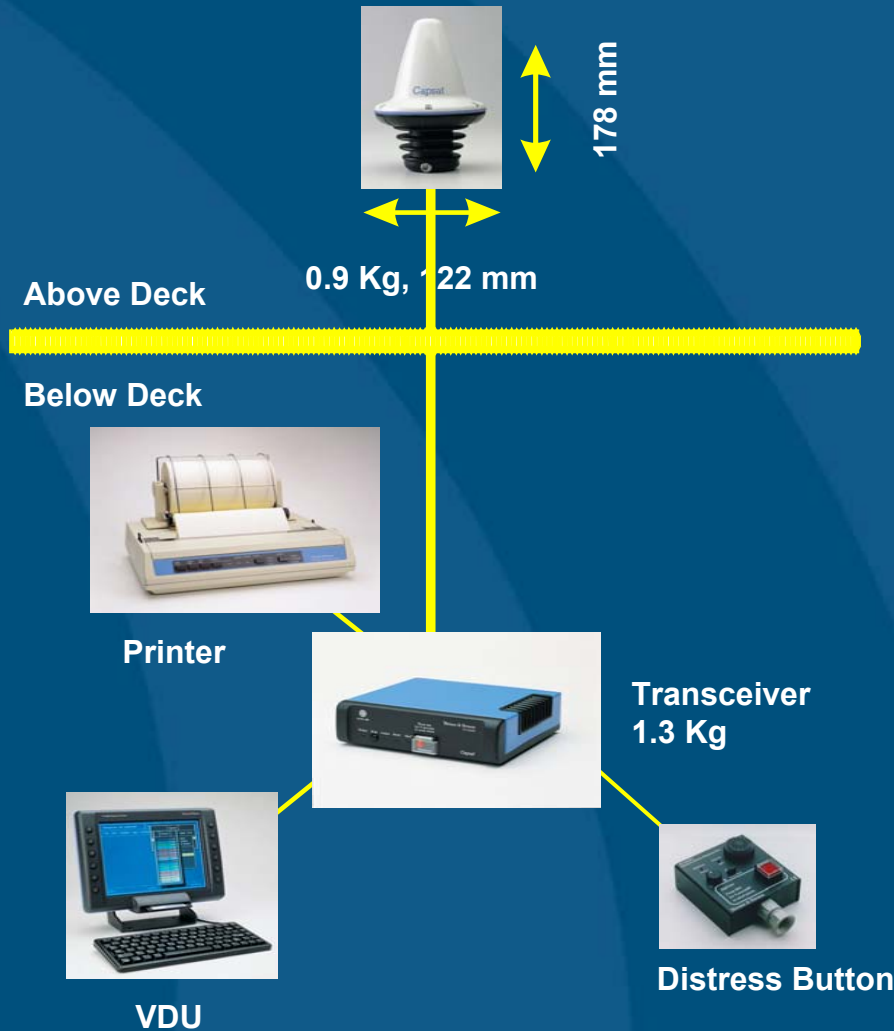
GMDSS Functions (fm SOLAS)	Inm-A	Inm-B	Inm-F77*	Inm-C	Inm-E
1. D/A ship-to-shore	Yes	Yes	Yes	Yes	Yes
2. D/A shore-to-ship			Yes	Yes	
3. D/A ship-to-ship					
4. SAR Communications	Yes	Yes	Yes	Yes	
5. On-scene communications	Yes	Yes	Yes	Yes	
6. Tx/Rx of MSI				Yes	
7. Locating signals					Yes (opt)
8. General communications	Yes	Yes	Yes	Yes	
9. Bridge-to-bridge communic.					

Global NAVTEX?



# Inmarsat C MES

Size, weight & main services

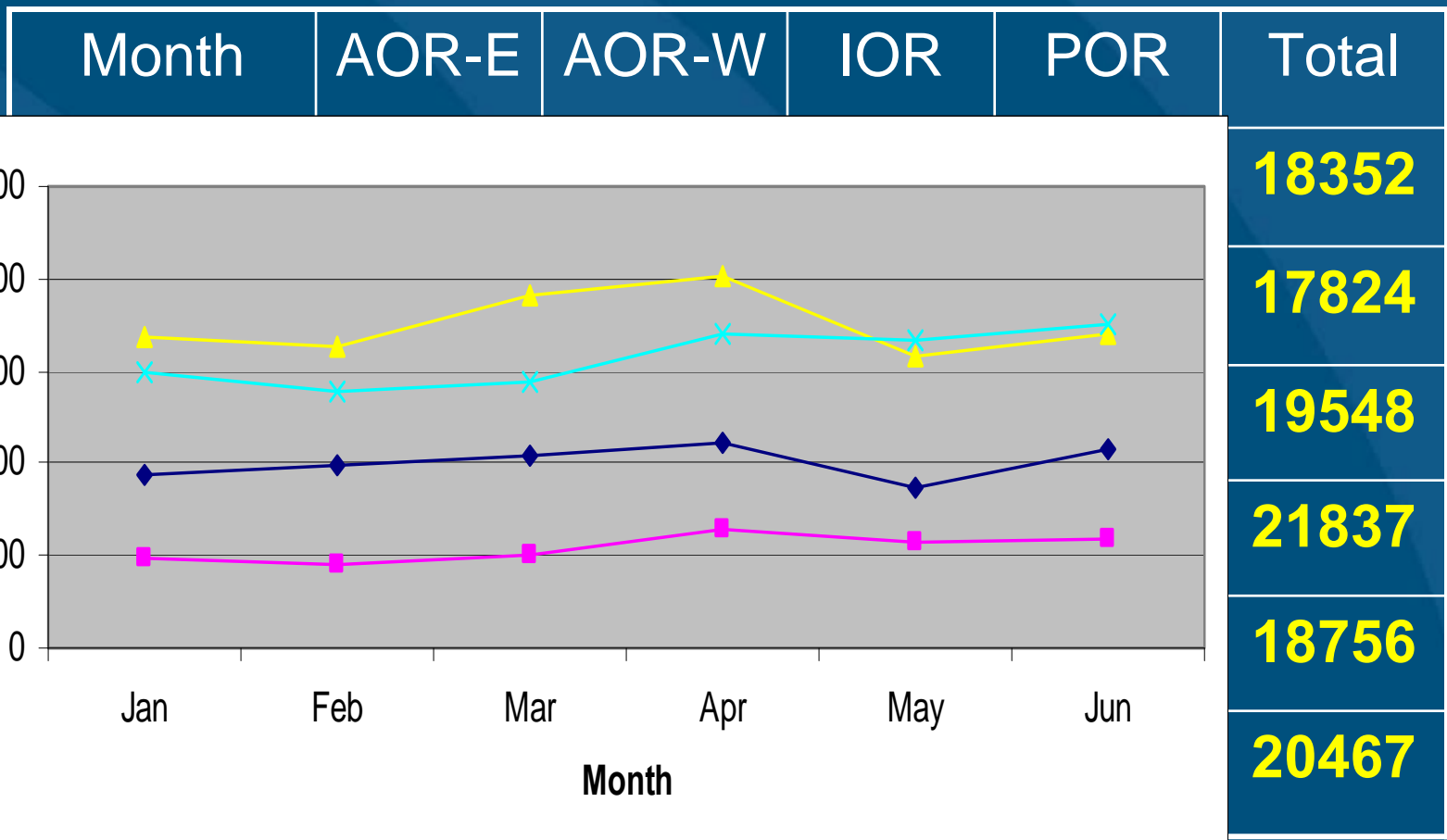


Inmarsat-C  
Store & Forward Messaging,  
Distress Calling, EGC SafetyNET  
and FleetNET, Data (position)  
Reporting & Polling

# Availability of Meteorological Information via SafetyNET

METAREA	Meteo information provider
I	UK Met office, Bracknell
II	Meteo France, Toulouse
III	Athens Marine Met Centre
IV	National Weather Service Washington
V	Brazilian Navy Marine Meteo Service
VI	Argentine Air Force National Weather Service
VII	South African Weather Service, Met France/La Reunion
VIII	India Met department, Met service Mauritius, Met France/La Reunion
IX	Pakistan Met Department
X	Aus Bureau of Met Melbourne, Darwin, Brisbane, Perth, Adelaide, Victorian Region Office
XI	NMC Beijing, Hong Kong Met Service, Japan Met Agency, Bureau of Met Darwin
XII	National Weather Service Washington, Honolulu
XIII	Vladivostok Weather
XIV	New Zealand Met Office
XV	Valparaiso Playa Ancha Radio – weather sea bulletin
XVI	National Weather Service Miami
R. Arctic	Arctic and Antarctic Research Institute, St. Petersburg

# Number of EGC SafetyNET messages per Month



Thrane & Thrane easyMail

File Edit Send Logs Distress Position Options Help

GPS: Ant. Signal: Status: Modem Not Connected

Send Address Book

To... Sending Met Re

Cc...

Bcc...

Subject: Inmarsat Ma Request for Request for Sending Ma V. Maksimov

Logs/Editor

Editor

Inbox

Sent Items

EGC

### Land Earth Stations Configuration

West Atlantic Ocean - LESs	East Atlantic Ocean - LESs	Pacific Ocean - LESs	Indian Ocean - LESs
001, Southbury	101, Southbury	201, Santa Paula	302, Goonhilly
002, Goonhilly	102, Goonhilly	202, Auckland	303, Yamaguchi
003, Yamaguchi	103, Yamaguchi	203, Yamaguchi	304, Eik
004, Eik	104, Eik	204, Eik	305, Thermopylae
012, Burum	105, Fuchino	208, Kumsan	306, Arvi
021, Aussaguel	110, Ata	210, Sentosa	308, Kumsan
022, Perth	112, Burum	212, Burum	310, Ata
	114, Tangua	221, Aussaguel	311, Beijing
	116, Psary	222, Perth	312, Burum
	117, Nudol		314, Boumehen
	118, Sintra		316, Psary
	120, Thermopylae		317, Nudol
	121, Aussaguel		319, Nontabouri
	122, Perth		321, Aussaguel

Default Edit Default Edit Default Edit Default Edit

OK

DNID  
 X.25

Cancel OK

Code Service:

Start In... Re... 6e... Mi... SO... F... Re... Th... Micros... 16:27

# Inmarsat C SCADA Applications



- Setting up remote monitoring and data collection installations with automatic sensors that report regularly back to a control centre
- Data reporting and polling protocol is used (up to 32 bytes of coded data in up to 3 packets)
- End-user communication cost - depends on a service provide and is about 0.04 (1 packet) – 0.15 (3 packets) USD and may depend on delivery network.
- Delivery to mailbox, Internet (e-mail address), PSDN, PSTN, Telex, Fax
- Applications: remote data acquisition, data monitoring, etc.

**NO DISTRESS FACILITY IS ALLOWED ON SCADA TERMINALS**

# SCADA example (maritime position report)

The image shows two overlapping email windows. The background window is titled "Position of 400099959: Lat 51 31 56' N Lon 000 05 16' W" and shows a "Position Report" with the following details:

Mobile: 400099959  
Time: Apr 21 12:02 UTC  
Latitude: 51 31.56' N  
Longitude: 000 05.16' W  
Course: 0 deg  
Speed: 0.0 knots

The foreground window is titled "Message from Inmarsat-C Mobile - Message (Plain Text)" and shows a "Maritime Mobile Position Report" with the following details:

Atlantic East Ocean Region, DNID : 8122, Member Number : 3  
Position : 50 51.44' N, 1 18.64' W  
Speed : 3.0 knots, Course : 349 degree  
Time of position : 24-JUN-03 12:44

Cost of the report for end user is about 0.10 - 0.12 USD

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# Inmarsat C and F77 in the Antarctic



- Location: Antarctic station “Vostok”, Russian Fed.
- Additional MES to Inmarsat B and Inmarsat C
- Position: 79,30° S 164° E
- Temperature: – 40-45°C (summer) and -70°C (winter)
- Service availability – 24 hrs / 7 days
- Inmarsat F77 is used for communication with the HQ, sending regular weather reports and private calls, Internet browsing
- Inmarsat C is used for sending weather observations (synopsis) via the world telecommunication network to meteorological authorities
  - TX every 4 hours
  - delivery time <5 mins
  - only geostationary satellites can be used since time delay is very critical

# Thank you for your attention

## Any Questions?

### Seafarers trust Inmarsat: with their lives!

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