



# STAYING CONNECTED

Communications for the  
Offshore Sailor  
Bob Thompson

# Agenda

- Types of Communications
  - Safety
    - National Distress Response System (NDRS) - US
    - Global Maritime Distress and Safety System (GMDSS)
  - Personal
    - Voice (Cellular/VHF/SSB/Satellite)
    - Data (Cellular/SSB/Satellite)
    - Internet (Satellite)
  - What Types of Communications to Use Where
    - Near Shore (up to 30 miles)
    - Offshore (over 30 miles)
- How to Build Your Communications Requirements List

# Safety Communications

- National Distress and Response System (NDRS)
  - VHF based system covering entire US coast out to 30 miles + Great Lakes and rivers + Alaska, Guam, Hawaii and Puerto Rico – Managed by the USCG
  - Channel 70 (DSC) and channel 16 VHF access
  - Replaces earlier system that is outdated
  - Direction finding capability on channel 70 – LOB from multiple stations and by GPS integration into channel 70 along with identification of calling station
  - Six simultaneous emergency communications channels (70 and 16)
  - Automated broadcasts (marine information)

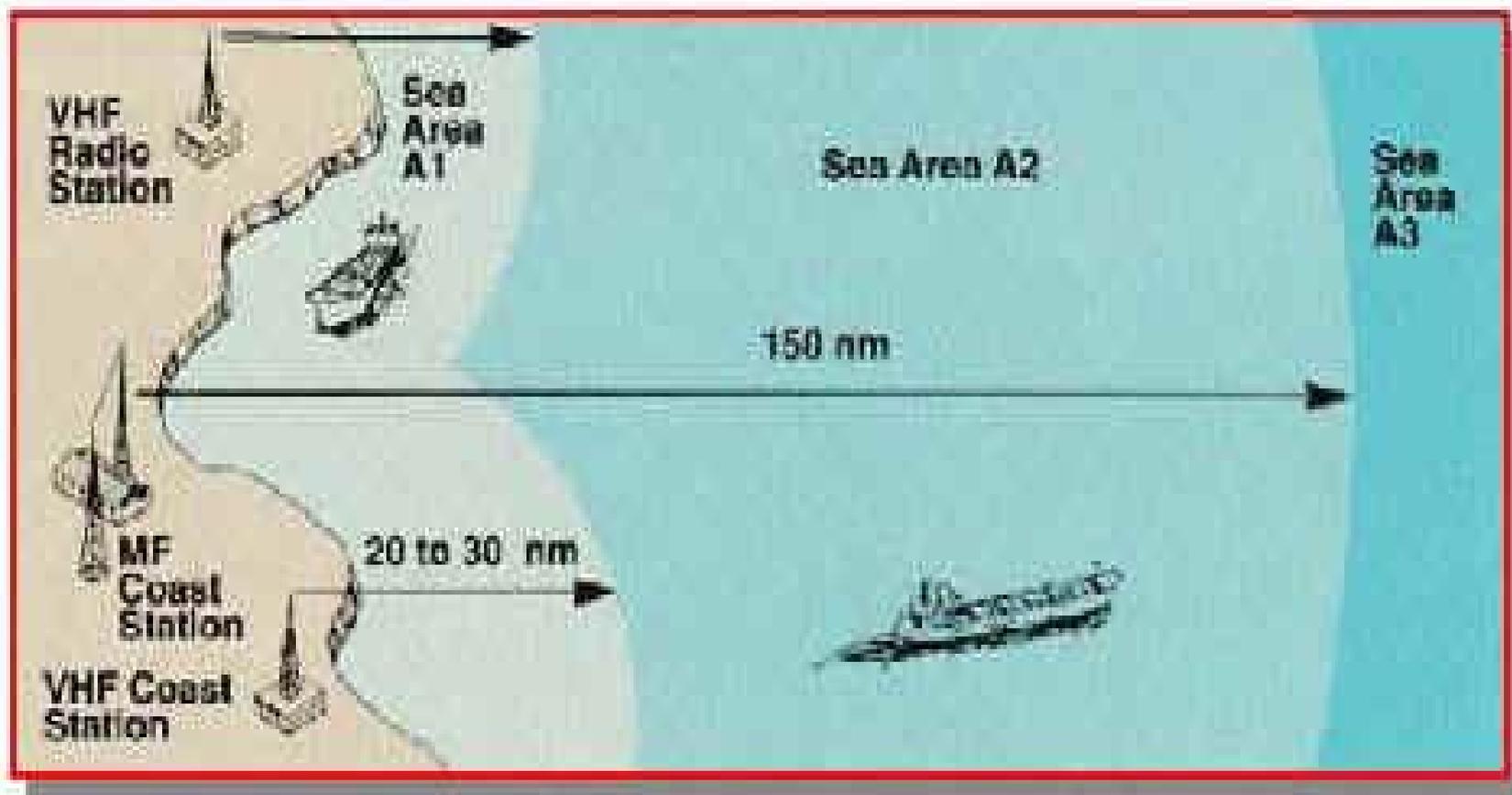
# Safety Communications

- NDRS Rescue Coordination Centers
  - Monitor VHF channel 16 and channel 70 (DSC)
  - Coordinate search and rescue operations
  - Communicate with commercial and recreational vessels
  - Provide command and control for Coast Guard units
- Updated NDRS will be fully implemented in late 2006/early 2007

# Safety Communications

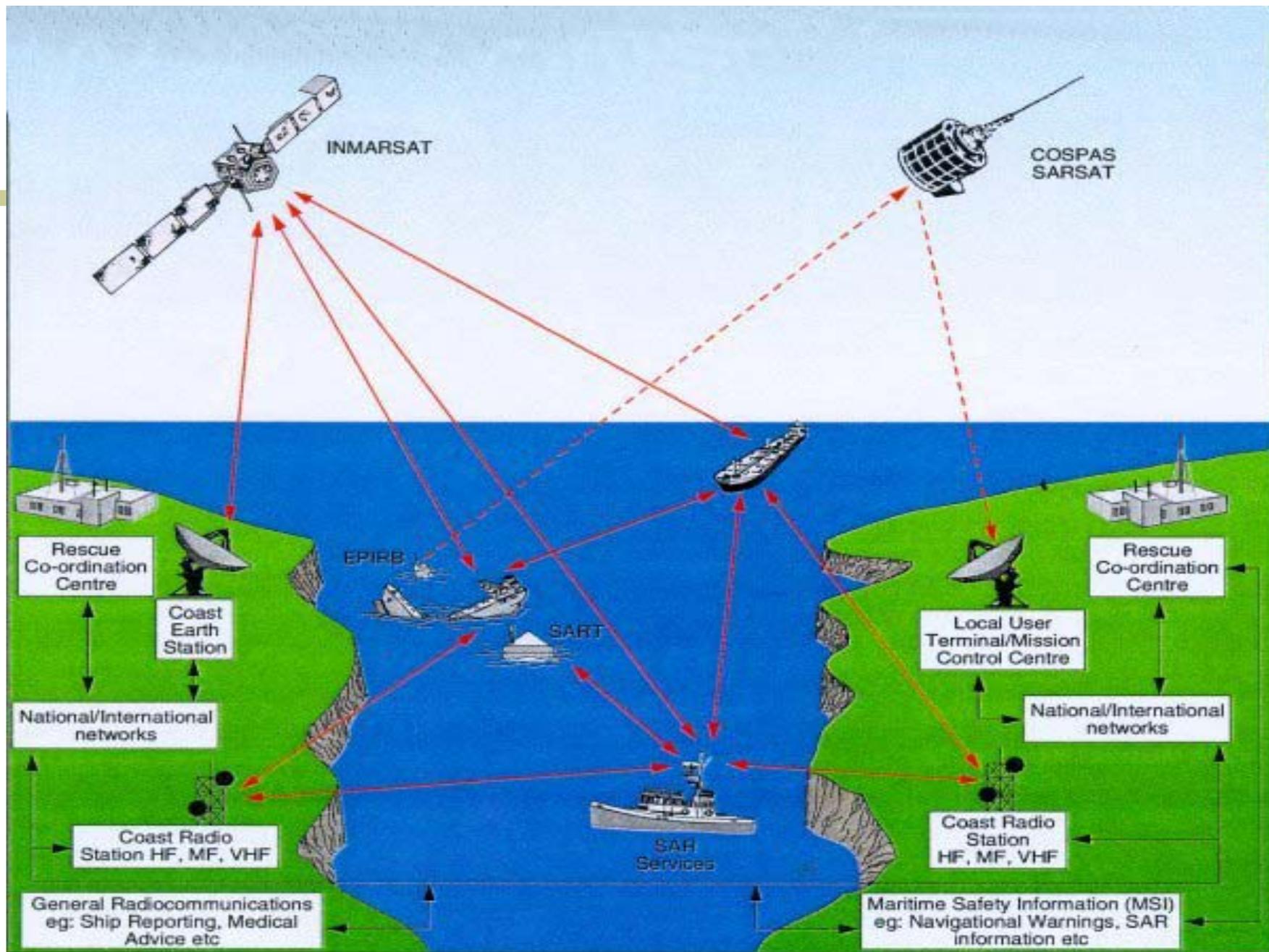
- Global Maritime Distress and Safety System (GMDSS) – International Maritime Organization
  - Mandatory participation for all vessels of 300 GRT as of 2/1/99 – Must carry an Inmarsat or Iridium satellite GMDSS transceiver
  - Recreational vessels can also participate – carry a GMDS satellite transceiver
  - World's oceans divided into four (4) regions
    - A1 – up to 30 miles offshore
    - A2 – 30 to 150 miles offshore
    - A3 – Inmarsat system coverage areas
    - A4 – Polar regions
  - Uses both terrestrial and satellite communications systems for rescue coordination

# Safety Communications



# Safety Communications

- GMDSS Communications Systems
  - Area A1 – VHF (DSC)
  - Area A2 – MF voice and VHF (DSC)
  - Areas A3/A4 – Satellite voice/data and VHF (DSC)
- Complying with Area A3/A4 requirements will provide compliance with all areas
- In many areas of the world, A3 compliance is required up to the coastline – No VHF (DSC) emergency service available
- *Complying with Area A3 requirements will provide the recreational vessel with access to global search and rescue services*



# Safety Communications

- GMDSS Communications System Requirements
  - VHF (DSC) with channels 70, 16, 13, and 6
  - One search and rescue transmitter (SART)
  - Portable VHF radio (DSC)
  - Inmarsat C ship earth station (satellite data) or Iridium (satellite voice)
    - *SSB transceiver in place of required satellite system will not fully comply with GMDSS, but will provide the same capability for long range emergency communications (ship to shore)*
  - 406 MHz EPIRB (not 121.5Mhz EPIRB – phased out by 2/1/09)
- Having these systems would provide the recreational vessel with GMDSS communications capability

# Personal Communications

- What You Need Depends on Where You Will Be Going and What You Want To Do
- Voice Systems
  - Inshore (within 30 miles)
    - Cellular
  - Offshore (outside 30 miles)
    - Single Side Band (SSB)
    - Satellite
      - Iridium (voice and low speed data)
      - Inmarsat Mini-M (voice/fax and 2.4kbps data)
      - Globalstar (partial ocean coverage)

# Personal Communications

- Data Systems for Email and Internet Access
  - Inshore/Onshore
    - Cellular – email and short messaging service
      - 3G cellular broadband services will greatly improve data throughput
    - Wireless PC – for use at wireless “hot spots” onshore
  - Offshore
    - Single Side Band (SSB) – email/weatherfax/broadcasts)
    - Inmarsat C – email/weaterfax (600bps low data rate)
    - Inmarsat Mini-M – email/fax (2.4 kbps low data rate)
    - Iridium – email/weatherfax (9.6kbps low data rate)

# Personal Communications

- **Expected Costs of Equipment and Voice/Data Service**
  - **Single Side Band**
    - Equipment - \$1,000 - \$2,000
    - Service – Voice varies with connection charges and where call is to be placed (comparable to satellite)
    - Email service very economical – Winlink or Sailmail
    - Amateur ham radio license is required for access to all frequencies
  - **Satellite**
    - Equipment - \$1,000 - \$5,000 (Iridium or Inmarsat Mini-M)
    - Service - \$1.50 - \$2.50 per minute for voice (no extra for email)
    - Service contracts are available that allow the user to tailor a monthly plan that will minimize costs
  - **VHF**
    - Equipment - \$500
    - Service – Cost of call plus a completion charge for using the marine operator (where available)

# Suggested Comm Outfits

- Coastal Waters (out to 30 miles)
  - Safety Communications Coastal Waters
    - VHF (DSC) – Provides channel 70 (DSC), 16 and 13 communications for emergency (NDRS), bridge to bridge and rescue coordination communications
    - 406 EPIRB (121.5 EPIRB service is being cancelled)
    - Handheld VHF (DSC) – For use in cockpit, life raft or small boat
  - Personal Communications Coastal Waters
    - Cellular – Provides voice and data communications plus short messaging service and small emails
    - Wireless PC for use at shore based “hot spots”
    - VHF (DSC) – Provides voice service for telephone calls through the marine operator (where available)

# Suggested Comm Outfits

- Offshore (over 30 miles)
  - Safety Communications Offshore
    - **VHF (DSC) – (Ship mounted) Provides channel 70 (DSC), 16 and 13 communications for emergency (NDRS), bridge to bridge and rescue coordination communications**
    - **406 EPIRB**
    - **Handheld VHF (DSC) – For use in cockpit, life raft or small boat**
    - **Single Sideband Transceiver – Long range emergency communications with global Rescue Coordination Services**  
or
    - **Satellite System – Voice or data communications with global Rescue Coordination Services**

# Suggested Comm Outfits

- Personal Communications Offshore
  - VHF (DSC) – Provides voice service for telephone calls through the marine operator (where available)
  - Voice and Data (Email) Communications
    - **Single Side Band (SSB) – Provides very economical voice and low rate data services (email/weatherfax/broadcasts)**  
or
    - **Iridium, Globalstar or Inmarsat Mini-M – Provides voice and low rate data services (email) and fax (Mini-M)**  
or
    - **Inmarsat C – Provides email and data messaging (plus GMDSS)**

# Your Communications Requirements?

- Comply with safety communications requirements
  - *Prepare an emergency communications plan and make sure all crew members know how to use the equipment to make emergency calls*
- Determine what you want to do for personal communications
  - Voice?
  - Data (Email/weather, etc.)?
  - Internet?
  - Fax?
- Where are you going to go?
  - Coastal cruising only (within 30+ miles)
  - Offshore sailing (over 30 miles offshore)
- How much do you want to spend, especially for ongoing service?

# [ How to Start ]

- Some Useful Websites
  - [www.winlink.org](http://www.winlink.org) (SSB email service)
  - [www.Sailmail.com](http://www.Sailmail.com) (SSB email service)
  - [www.iridium.com](http://www.iridium.com) (Iridium equipment and service)
  - [www.stratosglobal.com](http://www.stratosglobal.com) (Iridium and Inmarsat equipment and service)
  - [www.telenorsatellite.com](http://www.telenorsatellite.com) (Iridium and Inmarsat equipment and service)
  
- These websites will provide you with information on equipment and service