United States Coast Guard

• The lead military agency of the Department of Homeland Security (not DOD)

• A multi-mission agency:
  – Law Enforcement
  – Safety of Navigation & SAR
  – Military Operations
  – Environmental Protection

• Extensive Sea-borne and Air-borne Assets
COAST GUARD COMMS

• CG utilizes a full range of comms:
  - From Medium Frequency through UHF +:
  - 2 Megahertz through 800 Megahertz plus Satellite Comms

• CG utilizes a full range of modes:
  - Voice
  - Digital Data transmission
  - Images
NATIONAL DISTRESS RESPONSE SYSTEM (NDRS)

- Results of piecemeal growth.
  - Obsolete / aging equipment.
  - Lack of spare parts.
  - Non-standard equipment throughout system.
  - Limited to single channel, transmit or receive at a time.
  - Gaps & “Dead spots” in numerous coverage areas.
  - Virtually no DF capability.
  - Limited interoperability with other agencies.
  - No means for secure/protected communications.
  - No effective way to track assets.
  - Cannot comply with GMDSS obligations.
In 1999, a whole new concept in maritime communications was put into place called **Global Maritime Distress and Safety System**
GMDSS Components

- GMDSS mandatory on commercial vessels
- GMDSS voluntary on recreational vessels
- COSPAS – Satellite based SAR services
- VHF Radio
- Digital Selective Calling
- Rescue 21 System
- Automatic Identification System
- Cell Phones
VHF RADIO

- Most commonly used service in coastal areas and inland lakes. 20 miles
- Used by commercial and recreational vessels alike.
- Focused on Safety.
- CG monitors Channel 16 24/7.
- Other channels used for command and control.
- CGAUX uses 81A, 82A, 83A working channels
Digital Selective Calling

- Digital selective calling (DSC), an alternate distress communication system used internationally on Channel 70. If properly registered with a Mobile Maritime Service Identity (MMSI) number and interfaced with GPS, the DSC radio signal transmits vital vessel information, position, and the nature of distress at the push of a button.
• DSC is part of GMDSS
• DSC uses digital data rather than voice to transfer information between radios
• Can direct information to specific addresses
• Effective range is improved
• DSC Radios must be registered in order to work
• Encoded with unique 9 digit FCC ID number or MMSI to each vessel or shore station
• Information on vessel entered in USCG national distress database
• System operates on HF and VHF with worldwide coverage

• Sends automatic MAYDAY on Channel 70 that identifies vessel

• Private ship to ship calls possible just like a cell phone call

• DSC can not only page a specific vessel but also automatically switch that vessel’s voice radio to a specific channel

• DSC can page vessels in a particular area or in a pre-defined “Group”
USCG RESCUE 21 SYSTEM

- Largest system upgrade in CG history, will bring CG marine communications into the 21st century
- Contract awarded to General Dynamics Decision Systems (GDDS) in 2002
- Will cost $714 million
- Incorporates DSC for VHF
- Adds AIS (Automatic Identification System)
- Eventually will allow data transmission
- Implementation is behind schedule due to software problems and high site acquisitions
RESCUE 21 also provides for:

- Uninterrupted Channel 16 guard
- 98% coverage of maritime zone, out to 20 NM
- Direction-Finding capability =/- 2 deg 5 watt 2 meters off the water.
- Automatic Asset Tracking & Public Safety Interoperability
- Archiving/ Recording of calls
- Digital Selective Calling on Ch. 70
- Improved Recoverability & Operational Availability requirement
• Marine-band radios provide boaters the most reliable maritime distress notification.

• Rescue 21 helps the USCG save lives by taking the ‘search’ out of search and rescue.

• Rescue 21 is flexible to new technology, like DSC radios, but boaters must register their MMSI and properly connect the DSC radio to their GPS.

• Single biggest change in CG Comms since the introduction of FM VHF radio
PUGET SOUND
VESSELS TRAFFIC CONTROL SYSTEM
VTS Center 1974-1979
VTS Center 1979-1996
VTS Center 2006

Photo by Dave McKnew
Sector Operators at VTS

Photo by Dave McKnew
Operator on Straits Sector

Photo by Dave McKnew
What we see at VTS

Photo by Dave McKnew
Assist tug on the go

Photo by Petty Officer Van Hise
Cruise ship in Seattle

Photo by Dave McKnew
Bridge of Cruise Ship

Photo by Dave McKnew
Where not to be......
Automatic Identification System (AIS)

- AIS is a transponder based system using UHF radios.
- Vessels will automatically transmit a variety of information periodically.
- Supplements coastal radar coverage (Vessel Traffic System) with detailed information.
- Implemented now on large vessels.
Cellular Telephones on Boats

- CG does not advocate cell phones as a substitute for regular maritime distress and safety systems.
- Cell phones cannot generally provide ship to ship safety communications or communications with rescue vessels.
- Most cell phones are designed for land-based service and offshore coverage is limited.
- Locating a cellular caller is hard to do.
Cell Phones - Continued

- VHF marine radios provide storm warnings and other urgent advisories
- Cell phone best as an on-board telephone as a link to shore based systems
- VHF marine radio is a powerful ally in an emergency
Other Radio Options

Ham Radio   VHF/UHF/HF, Licensed Required
CB Radio    Low Power, No License, AM
GMRS        UHF, License Required
FRS         UHF, Very Low Power, CCTS

None of these systems are monitored by the Coast Guard
Primary purposes of the Auxiliary communications

- Coordinating authorized Auxiliary activities in support of Coast Guard Operation
- Augmenting the Coast Guard communications system, when required.
- Communicating urgent matters of official Auxiliary business.
- Training.
- Assisting national resources in time of disaster.
CG AUXILIARY ROLES

- Public Education - “Use of your radio”
- Safety Patrols (Puget Sound and Lakes/Rivers)
- Vessel Inspection - Team communications
- Watchstanding – CG & CGAUX
- Search and Rescue
- Harbor Security Patrols
- Long Range HF Emergency Preparedness
Base and Mobile Facilities
How can YOU Participate?

• Join a local Flotilla
• Fill out paperwork for Security Clearance
• Complete ICS Training
• Attend Communications Training (AUXCOM)
• Acquire a Radio Facility
IF YOU AIN'T GOT COMMUNICATIONS, YOU AIN'T GOT NUTTI N’
QUESTIONS