

An Introduction to DSC & AIS

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- 30+ years racing and cruising on sailboats from 20' – 70'
- USCG 50-Ton Masters License (w/ Sailing & Towing)
- 13,000 miles offshore racing & sailing
- Own & (sometimes) race the 1984 C&C 41 “*Insatiable*”
- Retired from IBM in 2004 after 30 years
- Own a small business that designs, sells & installs marine navigation electronics hardware & software



Objectives

- Gain a basic understand of DSC and AIS
- Provide an overview of functions available, products and price ranges
- Enable the viewer to make educated choices about whether and how to acquire DSC and/or AIS
- Offer suggestions as to where to go next

Agenda

- Digital Selective Calling (DSC)
 - What Is It?
 - What Can I Do?
 - How Do I Do It?
 - USCG Rescue 21
- Automatic Identification System (AIS)
 - What is it?
 - How do I do it?
- Conclusions & Q/A

Digital Selective Calling (DSC)

What Is It?

- Part of a global update of maritime safety systems called GMDSS
- Requires each user to have a unique 9-digit FCC identification number (MMSI)
- Digitally encoded packet sent on VHF channel 70 includes MMSI, position, type of call, etc.
- Received by all DSC-capable radios within range
- Encourages a more consistent response to emergencies

Digital Selective Calling (DSC)

What Is It?



Digital Selective Calling (DSC)

What Can I Do?

- Distress
- Individual Call
 - Caller selects working channel
 - Callee's radio shifts to the working channel
- Position Request
 - Caller's position \leftrightarrow Callee's position
- Polling Request
 - Callee's position \rightarrow caller
- Group call
 - Similar to individual call but uses "Group MMSI"

Digital Selective Calling (DSC)

How Do I Do It?

- Acquire a DSC-capable VHF radio
 - Every fixed-mount VHF since 1999 supports DSC
- Acquire a *Maritime Mobile Service Identity* (MMSI)
 - www.boatus.com/mmsi
- Connect ship's GPS to the VHF radio (NMEA 0183)
 - GPS Data Out → VHF Data In
- Connect VHF radio to chartplotter (optional)
- Input the MMSI into the VHF radio
 - Be careful!
- Choose acknowledgement option
- Set up MMSI table

Digital Selective Calling (DSC)

USCG Rescue 21 System



Great Lakes Schedule

- Detroit (10/2010)
- Buffalo (8/2011)
- Sault Ste. Marie (9/2011)
- Lake Michigan (11/2011)

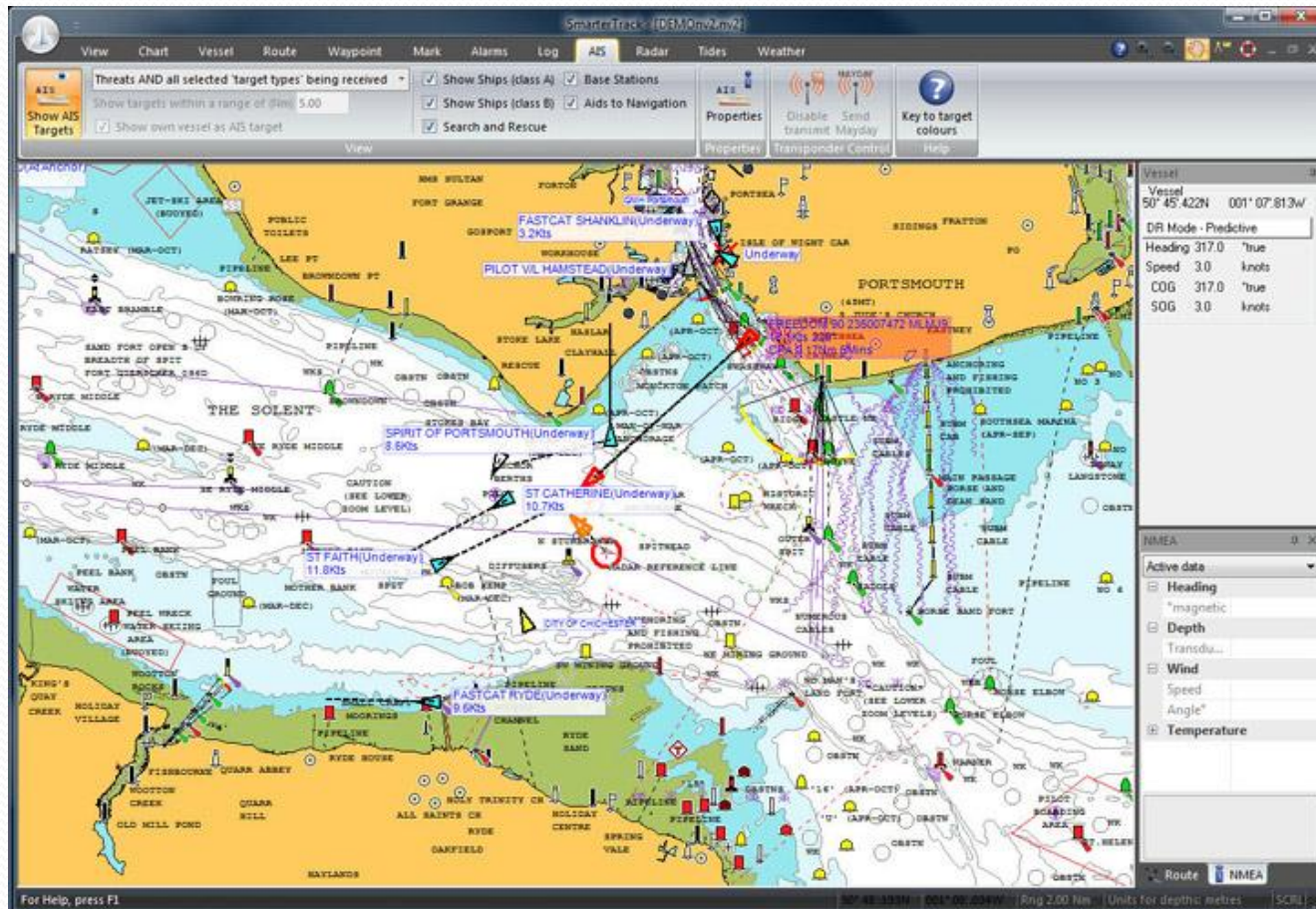
Automatic Identification System (AIS)

What Is It?

- Automated tracking system *required* on ships of 300 gross tons and all passenger ships
- Mandatory information includes MMSI, COG, SOG, Lat/Lon, Navigation Status
- Permits calculation of collision risk (CPA, TCPA)
- Used by Vessel Traffic Services to manage ship traffic
- Commercial vessels use a Class A unit
- Non-commercial vessels use Class B units that can receive and (in some units) transmit AIS data

Automatic Identification System (AIS)

What Is It?



Automatic Identification System (AIS)

How Do I Do It?

- Receive Only
 - Requires a dedicated VHF antenna or an antenna splitter
 - Connects to chartplotter via NMEA 0183 or NMEA 2000
- Transmit & Receive
 - Pre-programmed by manufacturer
 - Requires a dedicated VHF antenna
 - Connects to chartplotter via NMEA 0183 or NMEA 2000
 - Connects to GPS via NMEA 0183 or NMEA 2000
 - Optionally connects to heading sensor

Automatic Identification System (AIS)

AIS Class B Products

- Icom MXA -5000(www.icomamerica.com)

- Dual channel receive only
- Outputs NMEA 0183 data
- Street price ~\$350



- Milltech Marine SmartRadio SR161 (www.milltechmarine.com)

- Single channel receive only
- Outputs NMEA 0183 data
- Web price \$189



- Standard Horizon Matrix AIS GX2100 (www.standardhorizon.com)

- VHF & dual channel AIS receiver
- Outputs NMEA 0183
- Street price ~\$400



Automatic Identification System (AIS)

AIS Class B Products

- **Vespermarine** (www.vespermarine.com)
 - AIS 750 Watchmate Dual Channel (Receive Only) ~\$500
 - AIS 850 Watchmate Dual Channel (Transponder) ~\$1,100
- **West Marine AIS 1000** (www.westmarine.com)
 - Dual channel AIS transponder
 - Outputs NMEA 0183 data
 - Catalog price \$500
- **Garmin AIS 600** (www.garmin.com)
 - Dual channel transponder
 - NMEA 2000 compliant
 - MSRP \$1,399.99



Conclusions

- Properly installed and used, both DSC and AIS can enhance mariner safety
- DSC makes it easier to track and keep in touch with traveling companions
- AIS makes tracking surrounding vessel traffic simpler, thus avoiding collisions

Introduction to DSC & AIS

Links

- Digital Selective Calling (DSC)
 - GMDSS – www.en.wikipedia.org/wiki/Global_Maritime_Distress_Safety_System
 - BOAT/US MMSI Request – www.boatus.com/mmsi
 - USCG Rescue 21 - www.uscg.mil/acquisition/rescue21
- Automatic Identification System (AIS)
 - Description - www.en.wikipedia.org/wiki/Automatic_Identification_System
 - Icom - www.icomamerica.com
 - Milltech Marine - www.milltechmarine.com
 - Standard Horizon - www.standardhorizon.com
 - Vespermarine - www.vespermarine.com
 - West Marine - www.westmarine.com
 - Garmin - www.garmin.com

Introduction to DSC & AIS

Links (cont'd)

- Weblogs, Newsletters & Web Sites of Interest
 - Panbo Marine Electronics - www.panbo.com
 - Navagear - www.navagear.com
 - Practical Sailor - www.practical-sailor.com/issues/index.xml
 - Ocean Navigator - www.oceannavigator.com
 - Mad Mariner Software Review - www.madmariner.com/features/software
 - Power Squadron Web Site - www.usps.org