

VIBS 2018 PYS Presentation

How AIS Makes You
Safer on the Water

By Jeff Cote

Pacific Yacht Systems Inc.

design • installation • service • support

A Little about PYS



- 11 years in business
- Genesis: wanted a reliable and safe electrical system
- What makes us different
 - Expertise through specialization & repetition
 - 2017: Over 750 boats
 - Teamwork breeds synergy
- Team members
 - Detailed oriented
 - Passion for doing it right the 1st time
 - Our installations are safe and follow:
ABYC and NMEA standards



Purpose of Presentation



- How does AIS improve vessel safety?
- Why is the location of AIS antenna relative to VHF antenna Important?
- Can a regular VHF Antenna be used with AIS?
- What is a good approach to determine the EMI Problem

AIS Fundamentals



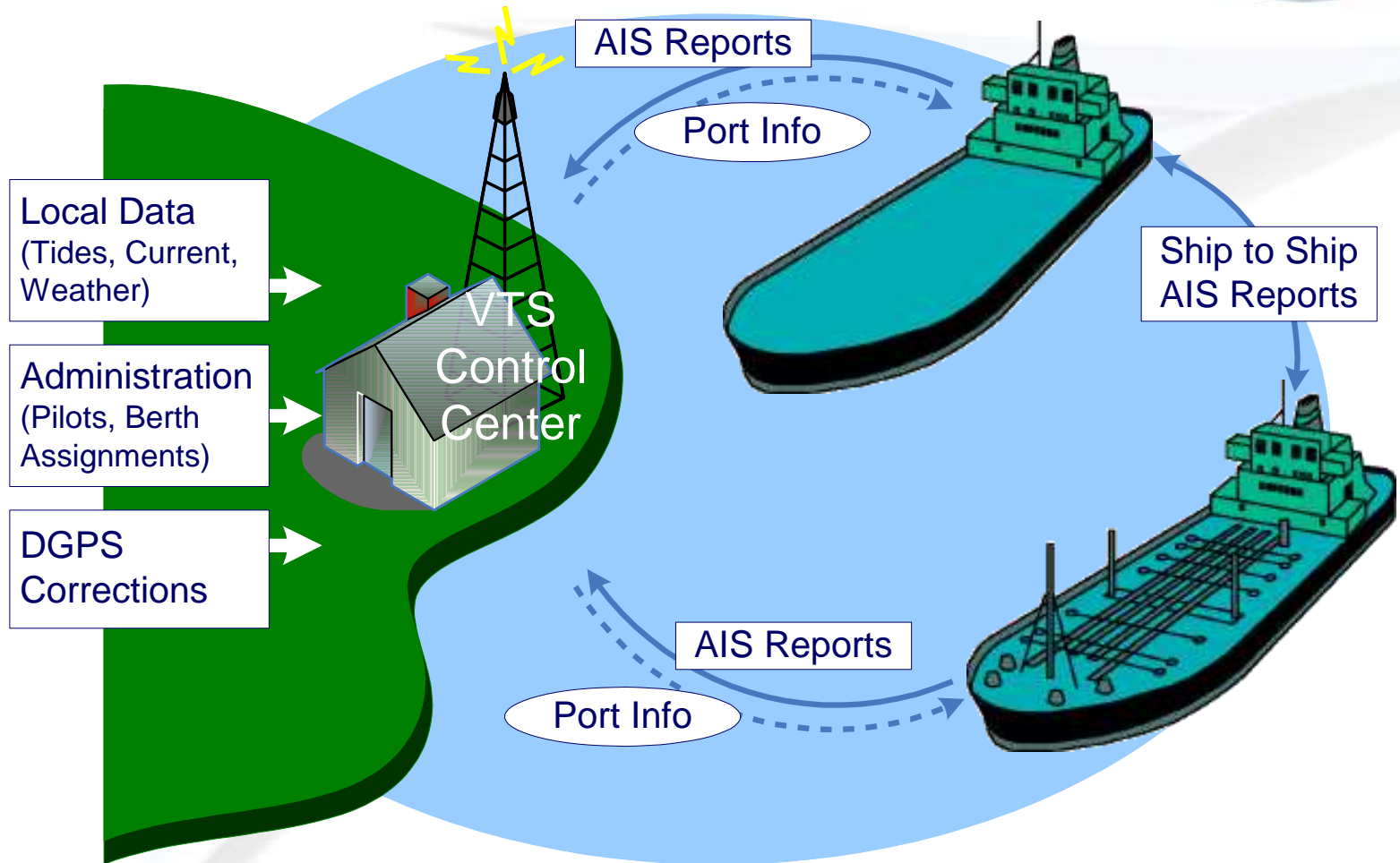
- Purpose: Increase Vessel Safety ⇔ Reduce VHF Traffic
 - Automatic Exchange of Navigation Information
 - Vessel to Vessel
 - Vessel to Shore
- Periodic Broadcasts of Vessel's Own Data
- Made Available to
 - All AIS-Equipped Vessel Operators
 - Shore-Based Traffic Control Operations

AIS Usage



- Displays surrounding traffic
 - See local commercial traffic
 - Plan a narrow passage or bridge
 - Hail other vessel by name
- Receive-only vs transmit & receive
- Collision alarm

AIS Network



AIS Classes & Installations



- **Class A - Required**
 - 2 to 10 second interval while underway
 - 3 Minutes while at Anchor
 - Supplemental data at 6-minute intervals
- **Class B (Same as Class A Except:)**
 - 30-second Interval while Underway <14 knots
 - Fewer Required Parameters
- **Receive Only AIS Installations**
 - Useful for Non-mandated Vessels

AIS Freq & Reach



- AIS transponders and receivers use two VHF radio frequencies:
 - 161.975 MHz (AIS1, or channel 87B) and
 - 162.025 MHz (AIS2, or channel 88B)
- Since AIS uses the same VHF frequencies as marine VHF
 - similar radio reception capabilities which is basically line of sight.
 - the higher your VHF antenna is mounted the greater the reception area
- Reception from Class A vessels that are 20 or even 30 miles away on open water is not uncommon
- Class B transponders use lower power for transmissions,
 - expect Class B vessels to be acquired when they are 5 to 7 miles away.

New AIS Antenna or Splitter



- Depends on boat type and layout, compromise between:
 - Higher the better
 - Not too close to other VHF antennas
- One option installed a powered VHF/AIS splitter

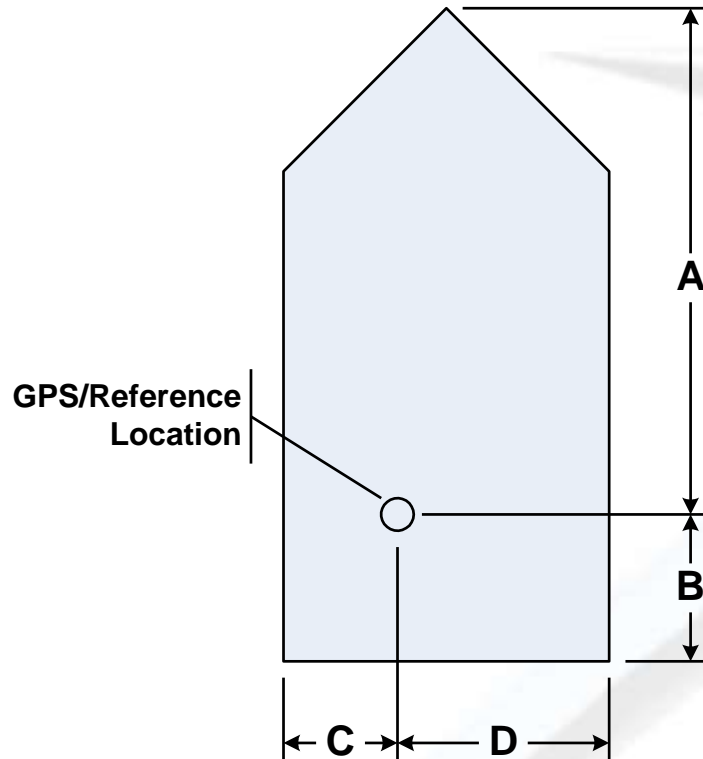


AIS Configuration



- Vessel Data
 - Maritime Mobile Service Identity (MMSI) Number
 - IMO Vessel Number
 - Radio Call Sign
 - Vessel Name
 - Vessel Type
 - GPS Location/Reference Position

GPS Reference Location



	Distance (m)
A	0 – 511 m 511 m = 511 m or Greater
B	0 – 511 m 511 m = 511 m or Greater
C	0 – 63 m 63 m = 63 m or Greater
D	0 – 63 m 63 m = 63 m or Greater

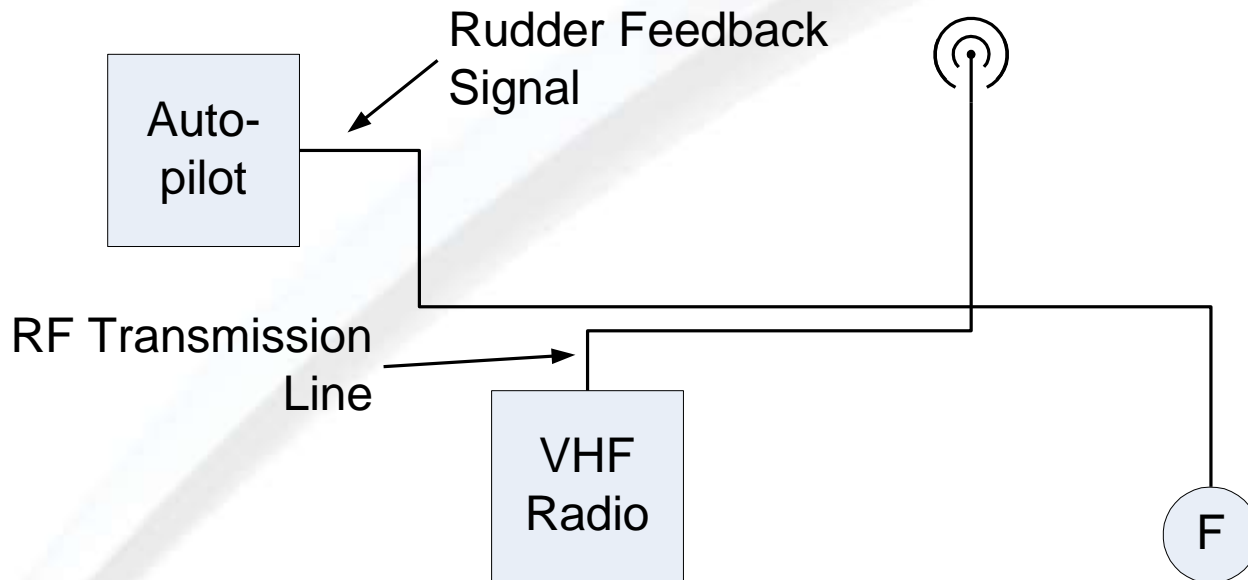
When Reference Location Unavailable, Use: $A = B = C = D = 0$

When Reference Location Unavailable, Vessel Dimensions in B, D
 $A = C = 0, B \neq 0, D \neq 0$

Avoiding EMI Problems



- Layout and Space Planning
 - Identify Potential EMI Radiation Sources
 - Identify Potential EMI Conducted Sources
 - Avoid Potential Hot Spots



Finding EMI Problems



- Trial-and-Error Process of Elimination
 - Turn off All Equipment Except for Affected Device
 - Turn on a Device and Check for Symptoms
 - Repeat Until Interference Symptoms Return
- Additional Testing May Be Required to Determine If Interference Is Radiated or Conducted
- Interference May Be Radiated from Cables Connected to Interference Source

Other Mitigation



- Relocate Cable Runs
- Relocate Equipment Displays
- Relocate Antennas
 - Consider Antenna Radiation Patterns
- Consider Cable Lengths
 - Avoid Multiples of $\frac{1}{4}$ Wave Length

Vesper Advantages



- AIS Transponder - Collision Prevention
 - Continuously determine crossing situations, receive collision alarms with full vessel information for critical action
- Anchor Watch
 - Sleep soundly, knowing you'll be alerted if your anchor is dragging.
- Man Overboard
 - Be alerted when your crew activate an AIS MOB device and see their current location for easy retrieval.

Vesper AIS Features



- NMEA gateway
- High resolution GPS (5Hz GPS update)
- Update SW easily via tablet or smartphone
- Low power consumption
- Galvanic isolated USB ports
- Fully Waterproof IPx7
- Vesper Watchmate App compatible
- External Alarm
- Silence mode



#1 Vesper XB-8000



#1 Vesper XB-8000



- “Blackbox” AIS Transponder and Receiver
 - Sends AIS info via Wi-Fi, N2k, NMEA 0183
- Access AIS data via local Wi-Fi on tablet or MFD vis NMEA
- Powerful external GPS included



#2 Vesper WatchMate Vision



- Display with touchscreen interface
- Sends AIS info via display, Wi-Fi, N2k, NMEA 0183, USB
- Built-in GPS receiver (optional external GPS)



#3 SmartFind S20 AIS MOB



#3 SmartFind S20 AIS MOB






- Designed to be fitted to a lifejacket
- Ready to be activated in the event of a man overboard situation
 - Deploys the antenna and activates the S20
- Features a high precision GPS and it will transmit position information and a serialised identity number back via AIS
- Transmits continuously for a minimum of 24 hours and has a 7 year battery storage life.
- Flashing LED indicator light makes it easier to spot at night
- Automatic deployment option (offered when professionally fitted) to compatible lifejackets

#3 SmartFind S20 AIS MOB



AIS Apps



	ShipFinder	<ul style="list-style-type: none"> - Ship Finder shows live moving ships on a worldwide map 	<p>PROS</p> <ul style="list-style-type: none"> -augmented reality tool (additional purchase) allows you to take a photo of a boat and it will provide the details <p>CONS</p> <ul style="list-style-type: none"> -not real time, 5 min delay -pop up advertising on free version is too frustrating
	Marine Traffic Ships & Wind	<ul style="list-style-type: none"> -Marine Traffic displays near real-time positions of ships and yachts worldwide. Connected to the largest network of AIS receivers, the app covers most major ports and shipping routes 	<p>PROS</p> <ul style="list-style-type: none"> -view live wind and 48 hour wind forecasts -playback of boat's track -augmented reality tool (additional purchase) <p>CONS</p> <ul style="list-style-type: none"> -must have an MMSI number
	Boat Beacon	<ul style="list-style-type: none"> -AIS marine navigation - Boat Beacon is the only AIS ship plotting app to share your boat's position, provide Collision Detection and use real-time data 	<p>PROS</p> <ul style="list-style-type: none"> -friends and family can watch where you are with the free Boat Watch App -do not need an MMSI number <p>CONS</p> <ul style="list-style-type: none"> -requires internet access to work -not an AIS transponder, other boats cannot see you on their VHF AIS system

The PYS Difference



- We are boaters too!
- Expertise through Repetition
- Many electrical “fixes” are indicators of the bigger picture.
- We can help you prioritize safety.

Connect with PYS



- Starting Point: PYS Electrical Audit for your boat
 - 90 minutes: Batteries, DC distribution, charger, alternator, inverter
 - Written report: observations & recommendations
 - Cost: \$189
- PYS Design Services for DIYers
 - Electrical system designed by PYS (collaborative and to code)
 - Installed by yourself or other outfit
- Pacific Yachting magazine - Monthly Tech Talk Column
- www.pysystems.ca 100s of articles
- Monthly email newsletter



Questions?



Pacific Yacht Systems

marine electronics & electrical

Full-service shop delivering
marine electrical and navigation
solutions tailored to your vessel
and your boating needs.

boating made simple
by design

design • installation • service • support

p | 604-284-5171 w | www.pysystems.ca

a | 1641 Powell Street, Vancouver, BC V5L 1H5