AIS Presentation

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What I'll Cover …

- What is AIS?
- AIS Transponders
- AIS Receivers
- Typical Usage Scenarios
- What's new and what's coming
- Questions

What Is AIS

- AIS = Automatic Identification System
- AIS is a broadcast Transponder system, operating in the VHF maritime mobile Band.
- It is capable of sending ship information such as identification, position course, speed and more, to other ships and to shore.
- Think ATC screens for shipping, fully automatic
- Uses VHF 87B & 88B to broadcast vessel information
- Two classes of transponders
  - **Class A**: current technology mandated for use on SOLAS and other types of commercial vessels
  - **Class B**: for use on recreational and small commercial vessels
  - Uses GPS to fix own position and transmits info via VHF
  - Both require VHF and GPS antennas (or possibly external GPS)
- NOT a replacement for radar or other watch methods

AIS Broadcast Information

Static data

- MMSI (Maritime Mobile Service Identity)
- IMO number (Where available) *
- Call sign & name
- Length and beam
- Vessel Type
- Location of position-fixing antenna on the ship
- Update rate: 6 min.

Dynamic data

- Ship's position with accuracy indication and integrity status *
- UTC
- Course over ground (COG)
- Speed over ground (SOG)
- Heading
- Navigation status (manual input) *
- Rate of turn--ROT (where available) *
- Update rates
  Dependent on speed and course alternation. (2 sec – 3 min)

Voyage-related data *

- Draft
- Hazardous cargo (type)
- Destination and ETA (at masters discretion)
- Route plan (Optional)
- Update rate: 6 min.

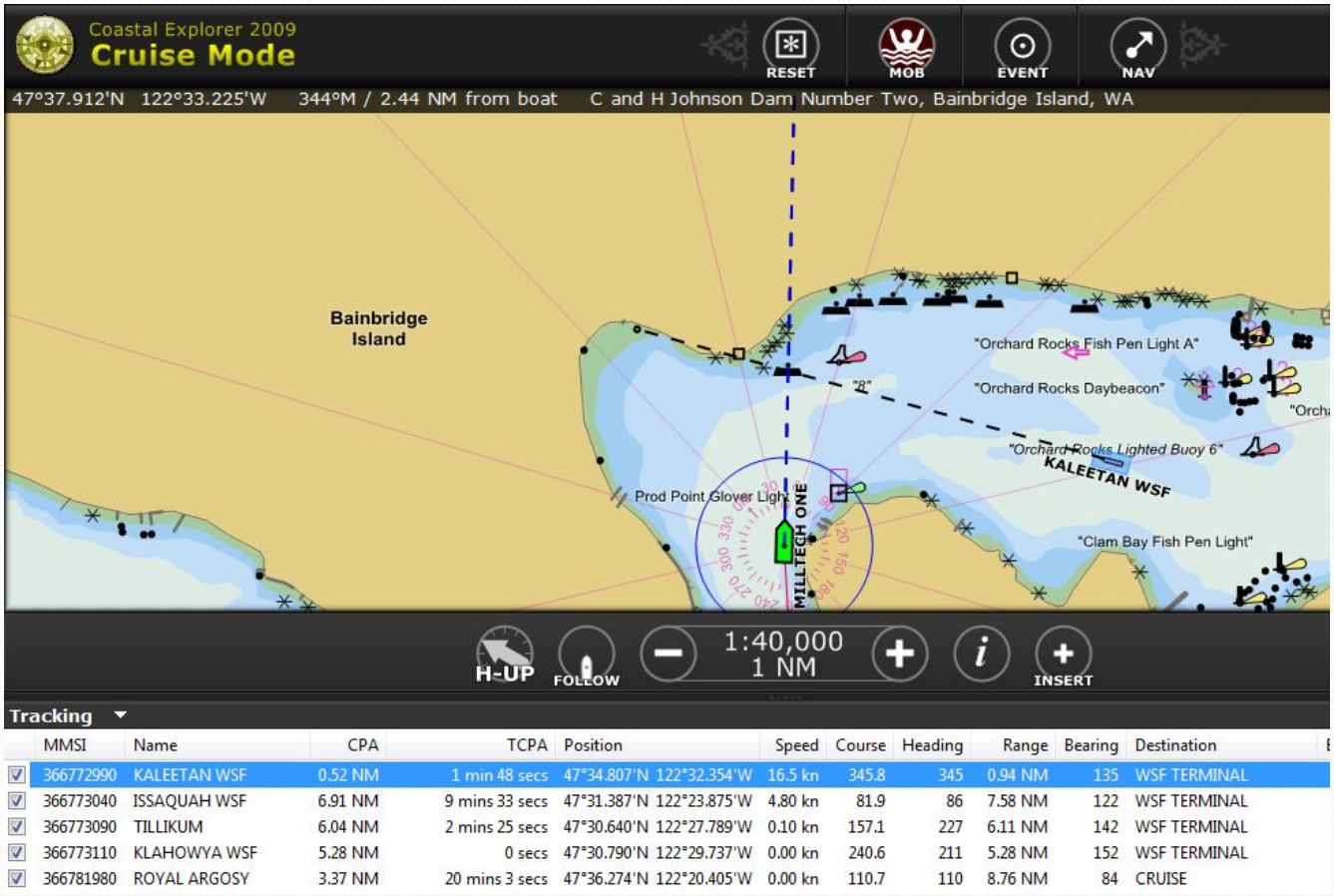
Short safety-related messages

- User-selectable
- Update rate: as required

* Class A only

Demo

- PC with Rosepoint Navigation Coastal Explorer
- Log of a GPS and AIS session
- See the demo on: http://youtu.be/m6Yugk7DSR8



MMSI	Name	CPA	TCPA	Position	Speed	Course	Heading	Range	Bearing	Destination
366772990	KALEETAN WSF	0.52 NM	1 min 48 secs	47°34.807'N 122°32.354'W	16.5 kn	345.8	345	0.94 NM	135	WSF TERMINAL
366773040	ISSAQUAH WSF	6.91 NM	9 mins 33 secs	47°31.387'N 122°23.875'W	4.80 kn	81.9	86	7.58 NM	122	WSF TERMINAL
366773090	TILLIKUM	6.04 NM	2 mins 25 secs	47°30.640'N 122°27.789'W	0.10 kn	157.1	227	6.11 NM	142	WSF TERMINAL
366773110	KLAHOWYA WSF	5.28 NM	0 secs	47°30.790'N 122°29.737'W	0.00 kn	240.6	211	5.28 NM	152	WSF TERMINAL
366781980	ROYAL ARGOSY	3.37 NM	20 mins 3 secs	47°36.274'N 122°20.405'W	0.00 kn	110.7	110	8.76 NM	84	CRUISE

Class A AIS Transponders

- Required on …
  - Vessels on international voyages / SOLAS
    - Tankers
    - Passenger vessels that are over 150 gross tons
    - Commercial vessels of 65 feet or more in length
    - Other vessels over 300 gross tons
  - Vessels operating within U.S. Vessel Traffic Service
    - Towing vessels of 26 feet or more in length and more than 600 horsepower
    - Passenger vessels, regardless of size, certificated to carry more than 150 passengers for hire
    - Self-propelled commercial vessels of 65 feet or more in length, other than fishing vessels and small passenger vessels certificated to carry 150 or fewer passengers.
- Typically used by …
  - Commercial fishing vessels, tugs, some barges
  - Super yachts
- Rarely used by …
  - Military or Coast Guard vessels
  - Small recreational or fishing vessels (Class B more appropriate?)
- Cost $2,500 - $10,000

Class B AIS Transponders

- Class B AIS
  - Targeted at recreational market
  - Approved by FCC / USCG in US since Nov 2008
  - Lower cost than Class A
- Class B is similar to the Class A, except that Class B
  - Has a reporting rate less than a Class A
    - e.g. every 30 sec. when under 14 knots, vs. 10 sec. for Class A
  - Does not transmit the vessel's IMO number or call sign
  - Does not transmit ETA or destination, navigational status
  - Does not transmit ROT information, maximum present static draught
  - Is only required to receive, not transmit, text safety or binary messages
  - Lower power transmitter 2 watt vs. 12.5 watt
- Other issues
  - Not all older displays "see" Class B, rumors of filtering Class B out?
  - Recreational adoption?
    - Must be pre-programmed by reseller or professional installer
    - Vessel Traffic Service know who you are and where you are (monitor channel 14)
    - Privacy concerns
  - Note: broadcast range 5-7 miles – not appropriate for tracking?

Class B AIS Transponders

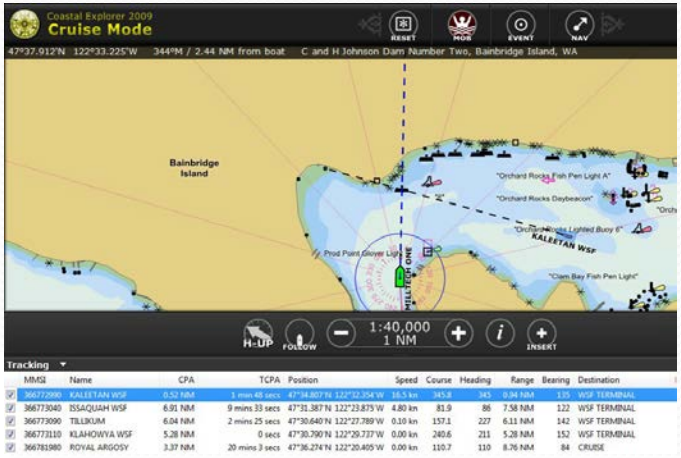
- Components
  - VHF transceiver
    - Broadcasts on 2 VHF channels (alternating)
    - Receives on both AIS channels
      Receives DSC messages for AIS management
  - GPS receiver
    - AMEC CAMINO-101 can use external NMEA GPS
  - Antennas (GPS and VHF)
  - Some with integrated display
  - Can interface with supported computer software and chart plotters via NMEA and RS232 / USB
  - 12-24v DC Power Required
  - Switch options for “silent mode” and SRM
- Pricing for kits under $500

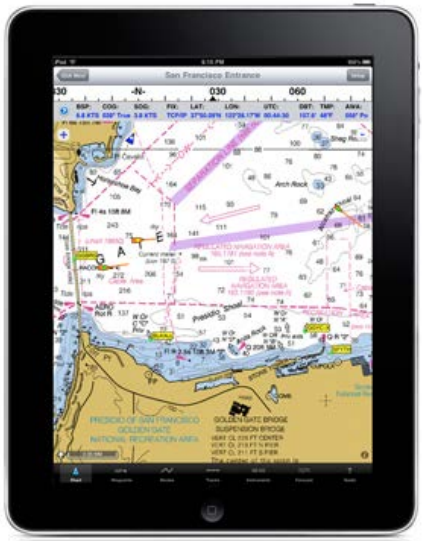
AIS Receivers

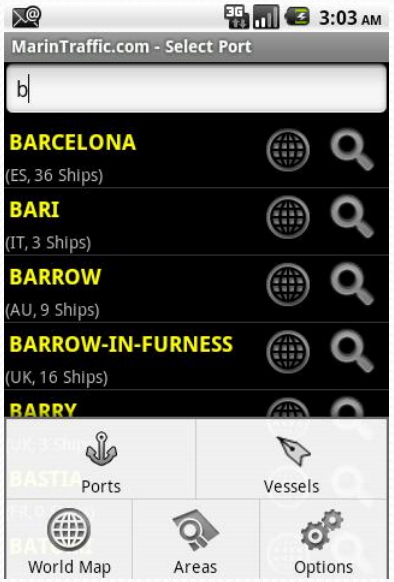
- Receives transponder broadcasts from both Class A and Class B transponders and converts into NMEA serial data
- Single or dual channel reception
  - Single channel less appropriate?
- GPS is <u>not</u> required for AIS receivers
  - Although some have integrated GPS or GPS multiplexer
- Outputs 38400 baud NMEA sentences
  - AIVDM, some receivers also output GPS
  - Used by computers or chart plotters
- Typical range 25+ miles with good antenna
- Typical connections
  - VHF antenna, 12-24v DC
  - Output line: serial (RS232), USB, NMEA 0183, NMEA2000
    - NMEA 2000 also now available (combined power & data cable)
- Users: recreational, commercial, military
- Pricing from $149

Navigation SW with AIS support

- PC software
  - Rose Point Coastal Explorer
  - AMEC AIS Viewer (free with AMEC products)
  - Nobeltec Visual Navigation Suite
  - Nobeltec Admiral
  - Boatcruiser
  - Fugawi
  - COAA Ship Plotter
  - MaxSea with the Mobiles Module
  - Seaclear (free!)
  - OpenCPN (free / open source!)
- Apple software
  - GPSNavX
  - MacENC
  - iNaxX (iPhone, iPad)
- AIS device to computer?
  - USB models available
  - RS232 models available
  - Bluetooth
  - WiFi
- Free online AIS viewing (no AIS receiver required)
  - www.marinetraffic.com plus tablet apps







AIS for Chartplotters / Displays

- Support from virtually all brands
  - Standard Horizon, Garmin, Raymarine, Furuno
  - Many other brands and models
  - Check with manufacturer if in doubt
- Dedicated AIS displays (AIS WatchMate)
- AIS Receiver to chart plotter?
  - Receivers with RS422 NMEA and RS232 output available
  - Connect AIS NMEA out to plotter NMEA in
  - NMEA 2000 another option (very easy)

Other AIS Gadgets

- AIS/VHF Antenna Splitters
- AIS Displays
- Networking solutions and multiplexers
- Antennas, GPS, cables and other accessories

AIS Scenario 1

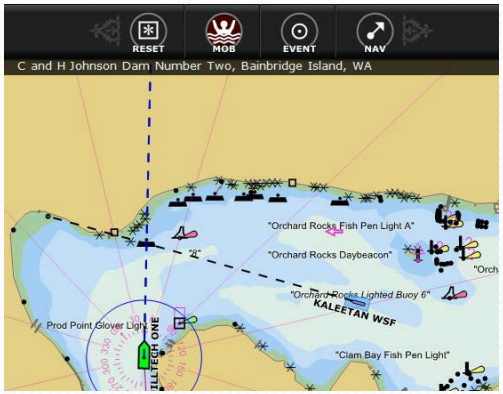
AIS Receiver to PC & Chartplotter

Comar AIS-MULTI receiver with integrated VHF antenna splitter

VHF Antenna to AIS-MULTI

AIS to computer via USB

Coastal Explorer AIS view



VHF antenna to radio

AIS to chartplotter via NMEA

GPS to Computer (Serial-USB)

GPS to VHF (for DSC)

Chartplotter AIS list

AIS LIST

NAME CALL SIGN	MMSI	IMO NUMBER	SOG Kts COG T	CPA Nm TCPA
SIMUL0 SIMUL0	100000000	100000003	1.8 236°	3.18 --:--:--
SIMUL7 SIMUL7	100000007	100000010	1.0 38°	4.18 --:--:--
SIMUL1 SIMUL1	100000001	100000004	2.3 63°	--.-- --:--:--
SIMUL2 SIMUL2	100000002	100000005	1.6 186°	--.-- --:--:--
SIMUL3 SIMUL3	100000003	100000006	1.0 242°	--.-- --:--:--
SIMUL4 SIMUL4	100000004	100000007	3.0 14°	--.-- --:--:--

ENT to show the target on chart

AIS Scenario 2

AIS Transponder to PC & Chartplotter

GPS antenna

AMEC CAMINO-101
Class B AIS
Transponder

AIS/GPS to computer
via Serial➔USB

VHF to
transponder

VHF
Antenna
Splitter

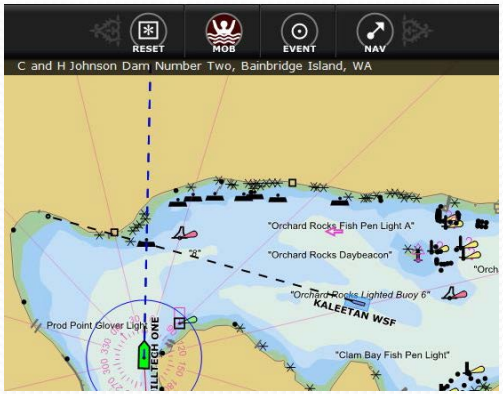
AIS to
chartplotter
via NMEA

VHF
to radio

GPS to VHF
(for DSC)

VHF Antenna
to Splitter

Computer AIS view



Chartplotter AIS list

AIS LIST

NAME CALL SIGN	MMSI	IMO NUMBER	SOG Kts COG T	CPA Nm TCPA
SIMUL0 SIMUL0	100000000	100000003	1.8 236°	3.18 --:--:--
SIMUL7 SIMUL7	100000007	100000010	1.0 38°	4.18 --:--:--
SIMUL1 SIMUL1	100000001	100000004	2.3 63°	--.-- --:--:--
SIMUL2 SIMUL2	100000002	100000005	1.6 186°	--.-- --:--:--
SIMUL3 SIMUL3	100000003	100000006	1.0 242°	--.-- --:--:--
SIMUL4 SIMUL4	100000004	100000007	3.0 14°	--.-- --:--:--

ENT to show the target on chart

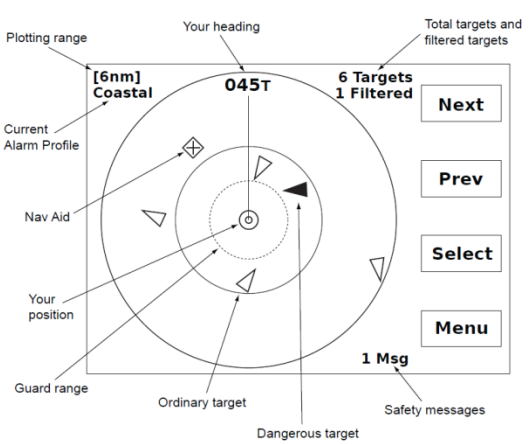
AIS Scenario 3

AIS WatchMate Transponder to PC

Optional GPS antenna

Vesper Marine AIS WatchMate Class B Transponder / Display

WatchMate AIS view



VHF to WatchMate

VHF Antenna Splitter

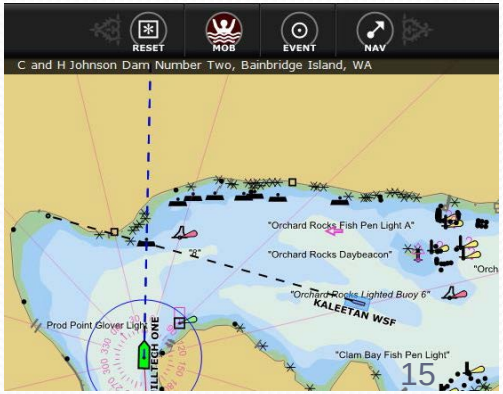
VHF Antenna to Splitter

AIS/GPS to computer via USB

VHF to radio

GPS to VHF (for DSC)

Computer AIS view

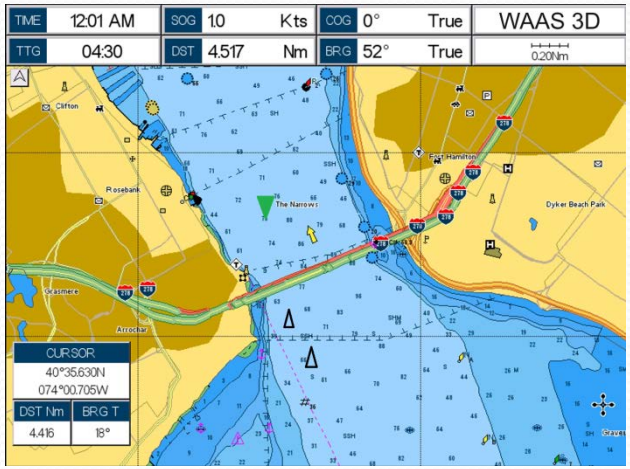


AIS Scenario 4

AIS Receiver / VHF Radio & Chartplotter

Standard Horizon CP300 Chartplotter with AIS display

Plotter with AIS display



AIS / DSC to plotter

GPS to VHF (for DSC & AIS)

VHF Antenna to VHF radio

Standard Horizon Matrix AIS VHF radio with AIS receiver

Radio AIS display

AIS Scenario 5

AIS to Computer, Chartplotter and iPad

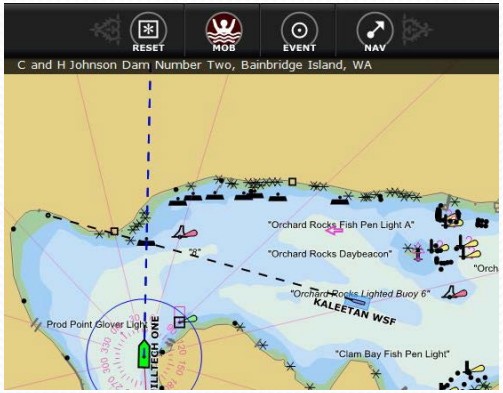
GPS antenna

AMEC CAMINO-101 Class B AIS Transponder

VHF to transponder

AIS/GPS to computer via Serial➔USB

Computer AIS view



Comar WiFi Multiplexer

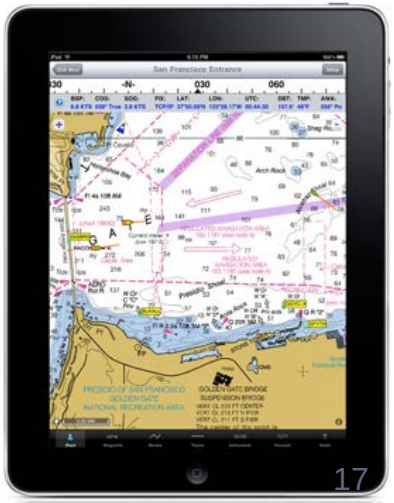
AIS data to multiplexer

Chartplotter data to multiplexer

AIS to chartplotter

AIS and NMEA data to iPad over WiFi

iPad iNavX AIS view

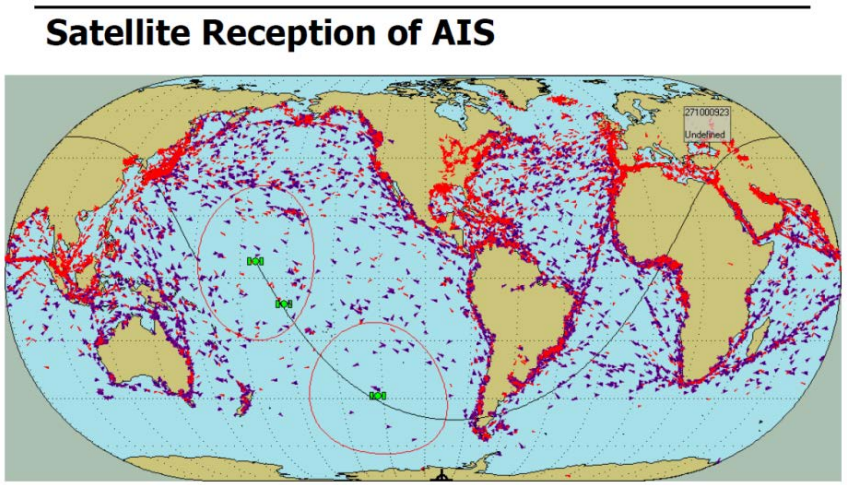


Top 10 Questions We Get

1. What's the most basic AIS system you have?
2. Does AIS work with my chartplotter?
3. Do antenna splitters really work?
4. What's the difference between single and dual channel AIS?
5. Can I use my existing GPS with a transponder?
6. Do I really need an FCC-issued MMSI for my transponder?
7. I bought a transponder and I can't see myself on MarineTraffic.com
8. I'm sailing across an ocean, what's the best AIS for me?
9. Can I install this myself?
10. How do I use AIS on my iPad or iPhone?

What's Coming?

- Even more integration
  - E.g. more devices with built-in AIS
  - Multi-function displays
- More connection options
  - More NMEA 2000?
  - Bluetooth, wireless
- New AIS rules?
  - As of 1/6/2012
    USCG still not decided
- New technologies
  - More AtoN, S&R, SART equipment
  - AIS Personal Locating Beacons this year?
  - More data e.g. weather
  - LRIT (Long range identification and tracking), satellite



Orbcomm AIS satellite launch Jan 2012

Next steps

- What to do tomorrow?
  - Check out www.marinetraffic.com
- What to do over the next month?
  - Decide whether AIS is right for you (of course it is!)
  - Decide on receiver or transponder
  - Transponder? Get your MMSI.
- What to do before your next major cruise?
  - Look at all your other equipment and choose an AIS solution that best meets your needs and works with existing or planned equipment.

Questions?

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Thank you!

And special thanks to Standard Horizon for demo equipment!!!