RAVEN

MARINE

SEND/AIS Operation Manual

For Use with the Raven Portable Marine Navigation Aid System

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Change History

Revision	Date	Description
N	05/08/2010	Updated to Raven Marine Logo and new style
M	11/23/2010	Updated to Raven Aerostar Division logos
L	06/29/2010	Updated to SendClient 4.75 and AisClient 1.73
K	03/23/2009	Replaced contact info with reference to contact info. Corrected table of contents error.
J	01/11/2009	Updated contact info, screens, and logo.
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1 Overview

The Starlink Electronic Navigation Data (SEND) system is software that can be loaded on the Raven Portable Marine Navigation system to allow vessel information-sharing via a wireless connection to the Internet.

2 Quick Start

Run WhIP (Wheelhouse IP) or WH II by clicking on the desktop icon, which auto-launches SendClient.

From SEND Client, select your own vessel or a remote vessel from the 'Select Vessel' list.

The selected vessel info is displayed on the SEND Client screen, and can also be viewed on the screen of the charting program, such as WhIP or WH II. Other vessels are also visible, but the data readouts on the SendClient and WhIP screens pertain to the selected vessel. The data on the WH II screen always pertains to the local vessel. To display a remote vessel in WH II, press F9 from WH II screen.

3 SEND Architecture

The SEND system consists of the following software components:

SEND Client, runs on mobile units on vessels

SEND Server, typically located at a fixed location.

SEND Monitor (a special use of the Send Client)

WhIP, WH II, or other charting program

Refer to the S.E.N.D. Architecture diagram on the next page. The SEND Client receives data from the local GPS receiver and passes that data to the charting program and to the SEND Server.

The SEND Server receives data from the SEND Client units and re-distributes that data so each SEND Client receives data from all other SEND Clients. The SEND Server can also forward data to a SEND Monitor if so configured.

A SEND Monitor is a SEND Client being used to receive forwarded data from a SEND Server.

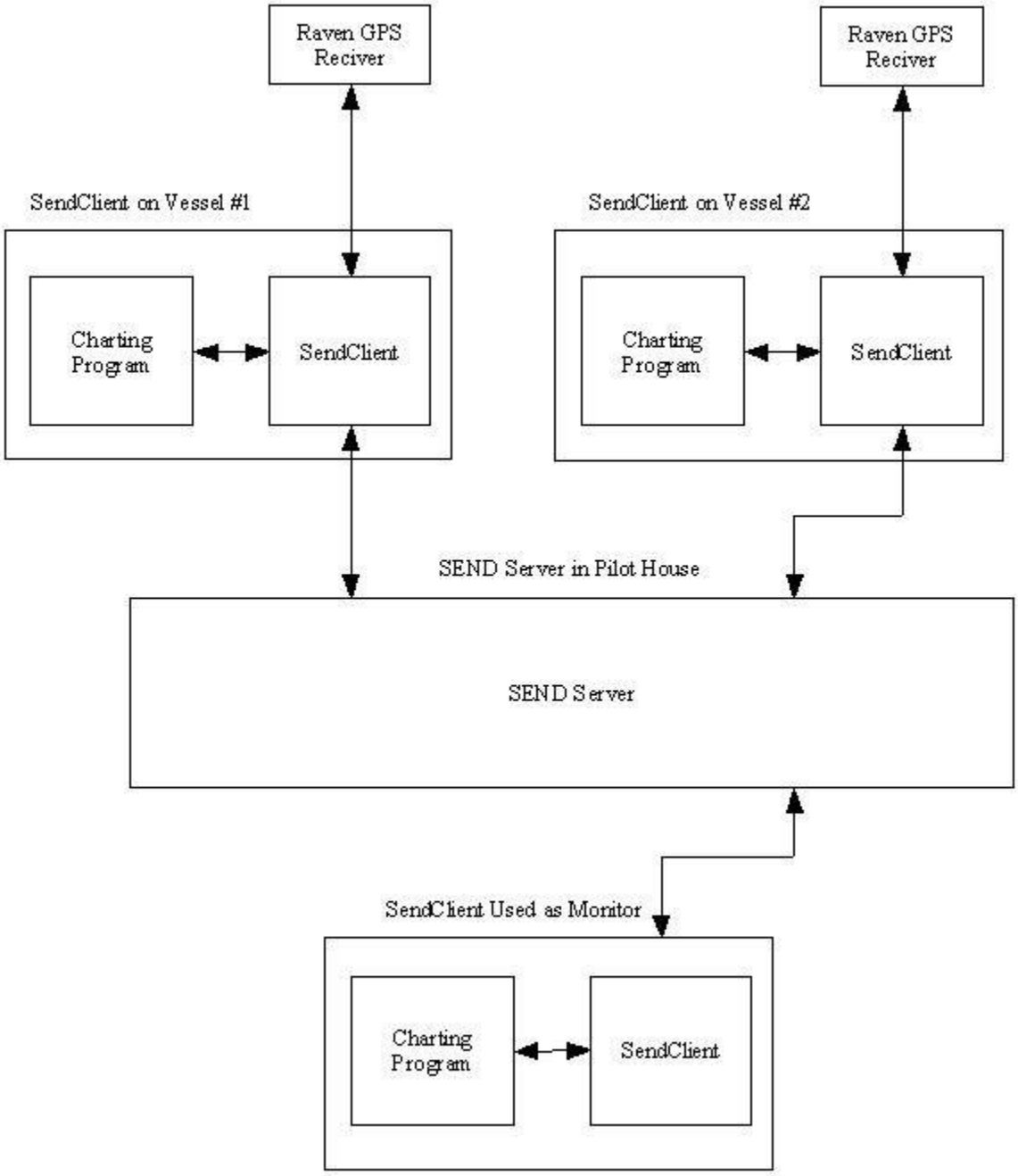


Figure 1: SEND Architecture

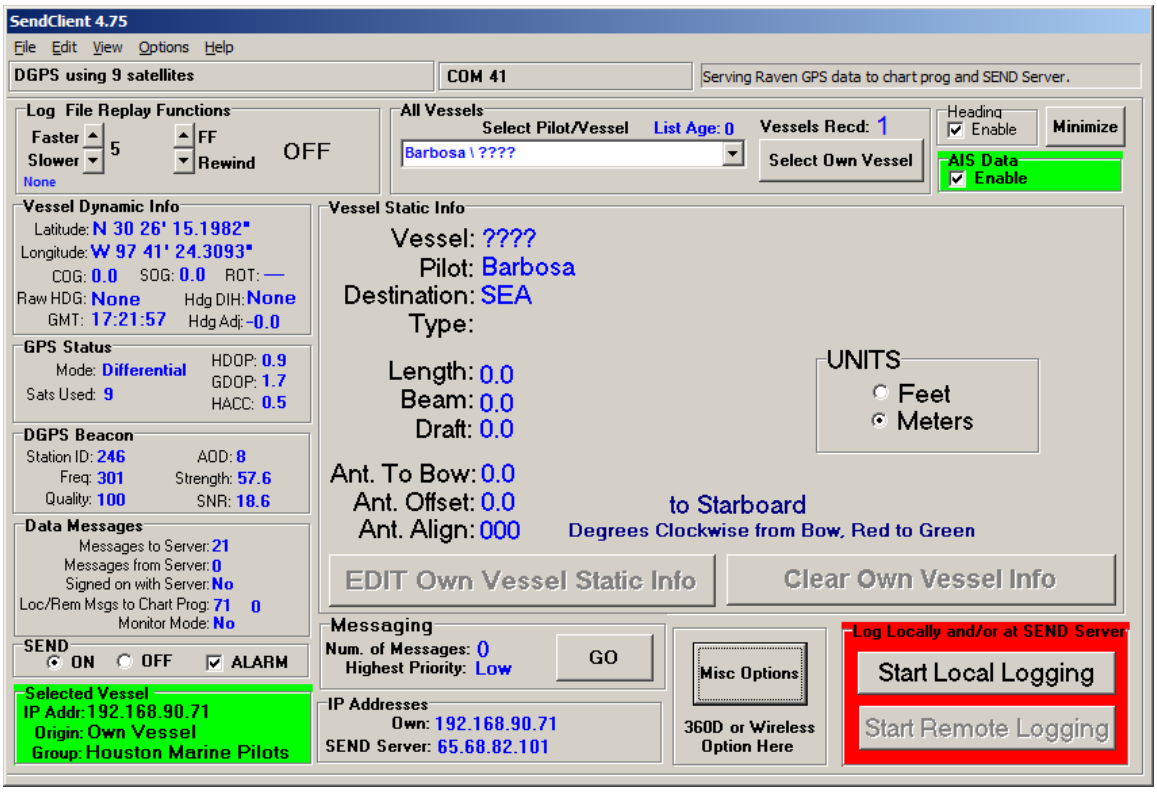
4 SEND Client Display

The SEND Client presents a list of vessels which includes your own vessel and all other vessels forwarded to you by the SEND Server. You can select the vessel you wish to view. The data for the selected vessel is sent to the charting program. The data for the other vessels is also sent to the charting program. The charting program displays multiple vessels simultaneously. WhIP displays the data for the vessel selected in SendClient, while WH II does not.

The dynamic and static information for the selected vessel are displayed in the respective windows. The Selected Vessel box is green when the selected vessel is the local vessel and red when the selected vessel is a remote vessel.

Systems getting heading from dual antennas can disable heading from being applied to the vessel on the charting screen by unchecking the Enable Heading box. The heading being computed by the system will still be displayed on the DIH icon on the taskbar.

Press 'Start Local Logging' to start logging your current trip. The file name is automatically assigned as MMDDYY_HHMMSS.LOG, where MMDDYY=month, day, year, and HHMMSS=hour, minute, second. To replay the log, select 'File | Read Log File'.



5 SEND Client Settings

You can select 'Options| S .E.N.D.' Client settings to set the Server IP Address. The SEND Client sends its vessel info to the Server IP Address, and gets other vessel info from the SEND Server.

Select the correct pilot group, which is used by both the SEND Client and SEND Server to identify the pilot group for a given vessel. This allows filtering based on pilot group when multiple pilot groups are being received.

If you select your own User Group, you will see and be seen by only members of your User Group. If you select Generic, you will see and be seen by all other clients, regardless of User Group.

You can also turn Monitor On and behave as a monitor only. To work, the Monitor mode requires that the SEND Server has the Monitor vessel's IP address set properly. Also not that when Monitor Mode is On, SEND on the main panel is OFF, and vice-versa.

The Vessel Tag used on the Wheelhouse/IP chart screen can be selected as either the Pilot Name or Vessel Name fields from the Vessel Static Info. The Vessel Tag also appears at the top of the Wheelhouse/IP chart screen and on the SendClient task bar icon.

The User and Password edit boxes are for use by those logging in from an IP address that is not in the approved list of IP addresses, such as a desktop computer at a user's home. A file containing a list of users and passwords must be provided to the SEND Server.

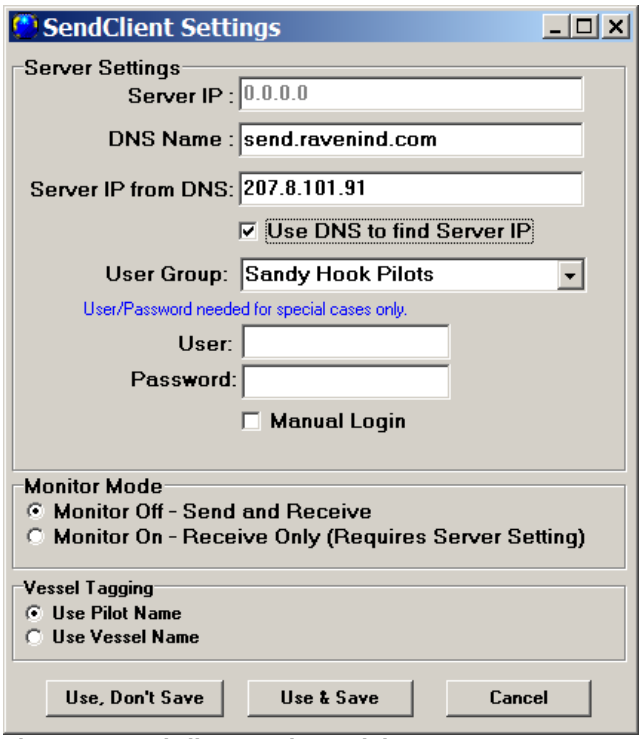


Figure 2: SendClient Settings Dialog

Pilots using the Raven SEND Server need to select the ‘Use DNS to find Server IP’ check box. Pilots using their own SEND Server need to clear the ‘Use DNS to find Server IP’ check box and place the IP of their own server into the Server IP field.

EXAMPLE:

If a Virginia Pilot selects the pilot group as Virginia Pilots, that pilot will see only other users who have selected Virginia Pilots and users who have selected GENERIC. If the pilot group operates its own SEND server, then this ‘party line’ behavior is not a consideration.

6 SEND Client Edit Vessel Static Info

This screen is used with the older WhIP charting program. It is not used with more recent charting programs. Thus, Edit Own Vessel Static Info on the SendClient main screen is disabled if you are not using SendClient with Whip.exe (sometimes referred to as WH1).

You can select 'Edit | Own Vessel Static Info' and enter your own vessel information, to be shared with other vessels. Or you can press the Edit button in the Vessel Static Info box. The vessel dimensions and antenna offset you enter is shared with charting program. If you press the Okay button, your vessel static info is automatically saved, and is restored the next time you start the program.

You can enter vessel dimensions and/or antenna offset in WhIP, and they appear on the SendClient screen. Conversely, entering vessel dimensions and/or antenna offset causes these values to appear in WhIP. You can also enter vessel static info by selecting a previous vessel from the Previous Vessels drop-down box.

For systems with dual antenna heading, select one of the 3 options that best describes the antenna alignment, red to green, with respect to the actual heading of the vessel. The 'Athwartships' or 'Fore and Aft' options are most commonly used, but on rare occasions 'Other' may be the best option.

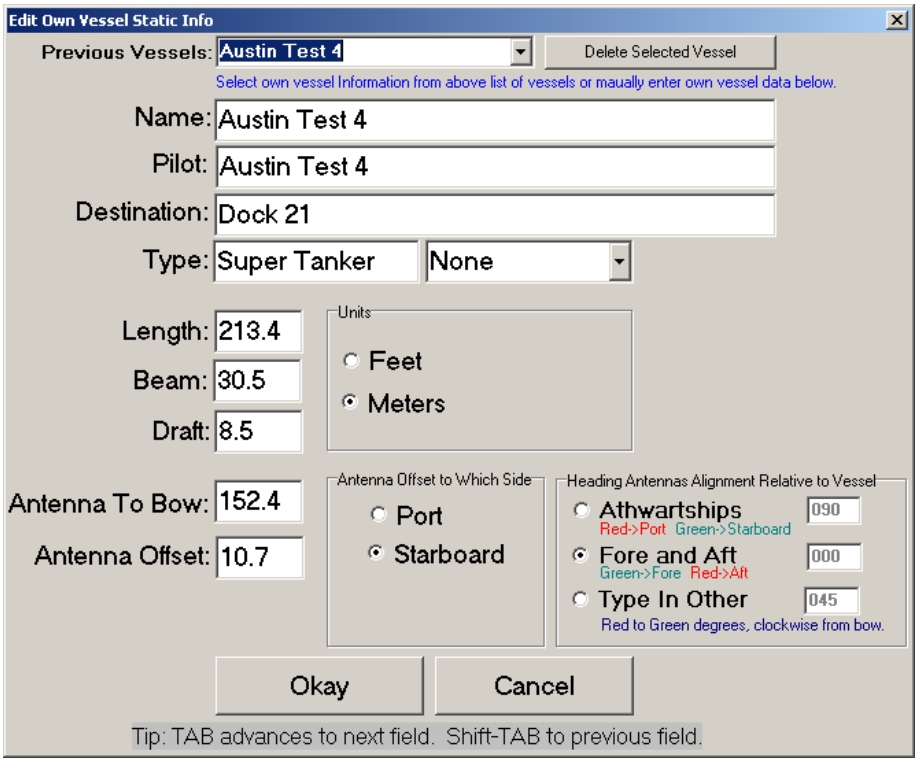


Figure 3: Edit Own Vessel Static Info Screen

7 Instant Messaging

If you select ‘Go’ from the SEND Client 'Messaging' box, the following window appears. To talk to a given vessel, select the vessel from the ‘Select Pilot to Send To’ list at the top left.

To send a message:

- select the pilot to send to from the list at the top OR check ‘Send to Server’
- type the message into the ‘send’ edit box
- if desired, select the priority of the message from the Message Priority list (this determines the type of sound made when the message arrives)
- press the Send button

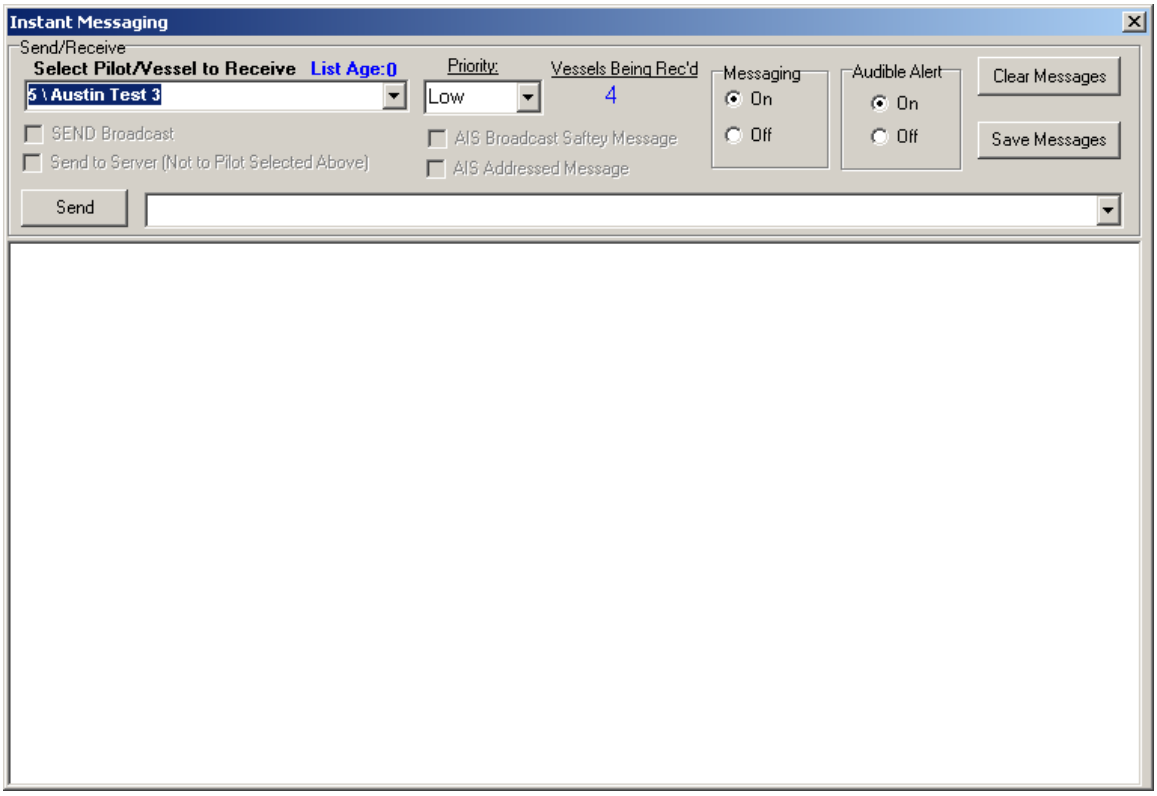


Figure 4: Instant Messaging Window

Currently, there is no guaranteed delivery on instant messages. It’s possible that a message may get lost. We may add guaranteed deliver later.

You can save the messages that appear in the message area by pressing the Save Messages button a specifying a file name.

If you turn messaging off and someone sends you a message, you will not be aware of it, but the sender will be informed that you have turned off messaging.

8 Logging and Replaying Raw GPS Data

The commands to create and replay a log file in Wheelhouse have not changed. You can still use them exactly as before. But the new features below have been added. With the Wheelhouse commands, if you select to write a log file and there are more than 16, you have to delete one. If you use the new SendClient logging/replay features, then the 16-file restriction does not apply. Also, if you use the SendClient features, you do not have to name the log file.

LOCAL LOGGING FROM SENDCLIENT:

- Press 'Start Local Logging' to start logging.
- Press 'Stop Local Logging' to stop logging.

The log file name is automatically supplied by the system according to the following format:

MMDDYY_HHMMSS

Where MMDDYY = month, day, year

HHMMSS = hours, minutes, seconds

There's a special setting in Sendclient.ini that allows you to auto-start logging raw GPS messages at startup.

To replay a GPS log file:

- Select 'File | Read Logfile (Own Vessel)'.
- Select one of the log files to replay.
- Select 'File | Stop Reading Logfile' to stop replaying a log file.

9 Managing Your Log Files

Use LogMan (Log file manager) in the Laptop Admin folder to compress, delete, or 'keep' your log files. Note that raw GPS and raw AIS log files are stored in the home directory of the data set, not in c:\wh2logs. Examples of home directory: c:\HOU, c:\NY, c:\VIR, etc., depending on the pilot group abbreviation.

10 View Software Versions

If you select 'View | Selected Vessel Software Versions', you can see what software versions the selected vessel is running, whether it is your own vessel or a remote vessel.

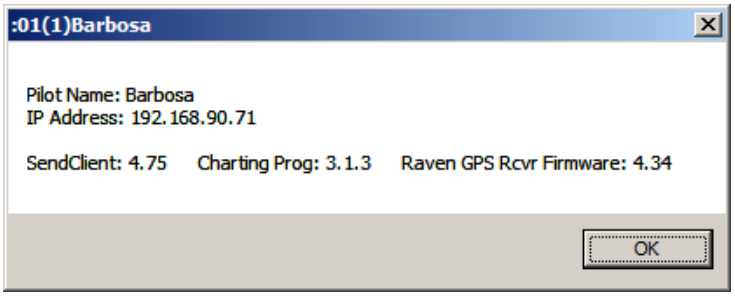


Figure 5: Example of a 'Selected Vessel Software Versions' Screen

11 Wheelhouse Options

If you select 'Options||Wheelhouse Options', the following screen appears:

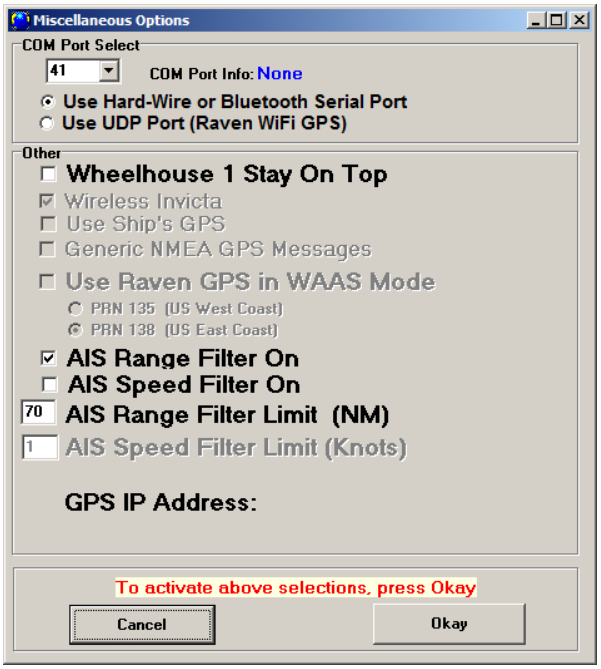


Figure 6: Miscellaneous Options Screen

Select 'Use UDP Port (Raven WiFi GPs)' if the GPS receiver is a Raven WiFi GPS receiver. Select 'Use Hard-Wire or Bluetooth Serial Port' if the GPS receiver is connected directly to a COM port or if it is a Bluetooth device. Use the COM Port drop-down selection list to select the desired COM port for a hard-wired or Bluetooth-connected GPS receiver.

If your charting program is WhIP, uncheck 'Wheelhouse Stay On Top', to allow switching between programs without pressing the WhIP F10 (minimize) key first. This allows touch

screen users to touch the icon on the task bar of the program they desire. The down side of this is that another program might seize the foreground when the user desires the WhIP screen. By design, this setting does not persist across invocations of SendClient.

The AIS Range and AIS Speed filters should be ignored by WHII users. WhIP users may set these filters as desired.

12 View Serial Data Screen

If you select ‘View | GPS Data for Own Vessel’, the following screen appears, showing the raw serial data coming from the GPS receiver.

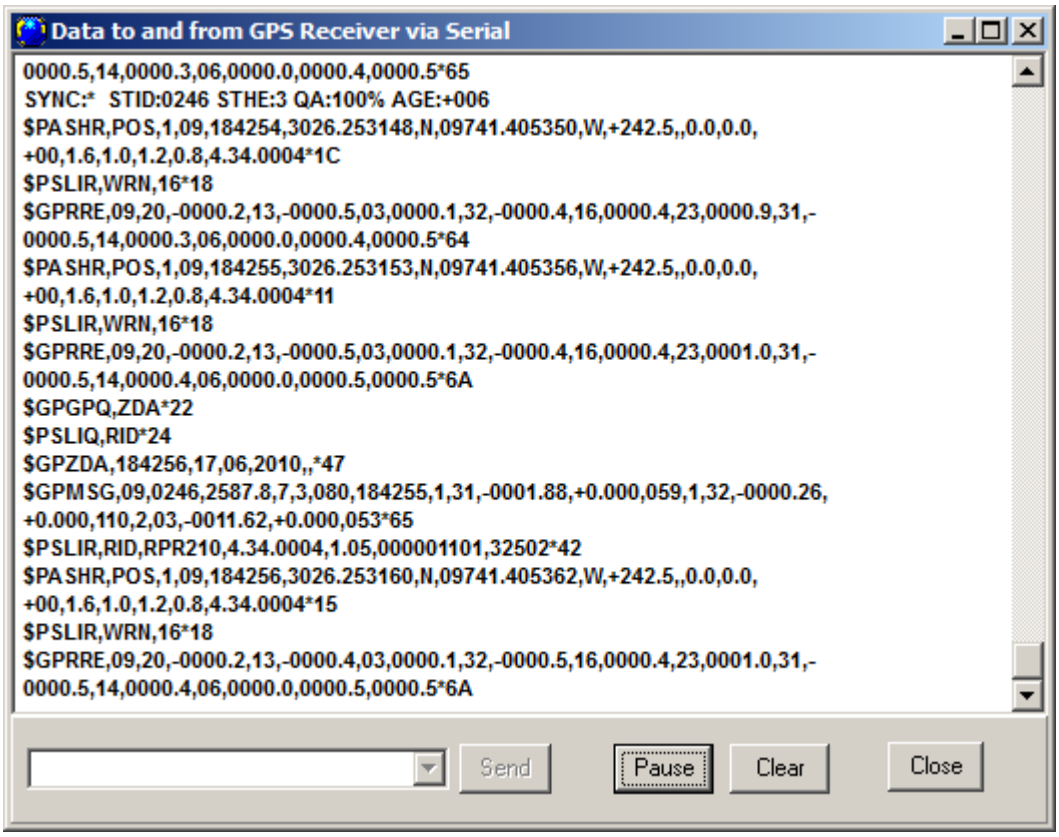


Figure 7: Data to and from GPS Receiver via Serial Screen

13 WhIP Displaying a Remote Vessel

When you select a vessel other than your own from the SEND Client list, WhIP displays 'Remote Vessel' in red on the F1, F2, and F3 screens.

WhIP displays multiple vessels simultaneously. The data panel info on F1, F2, and F3 applies to the vessel selected in SendClient, which is usually the local vessel.

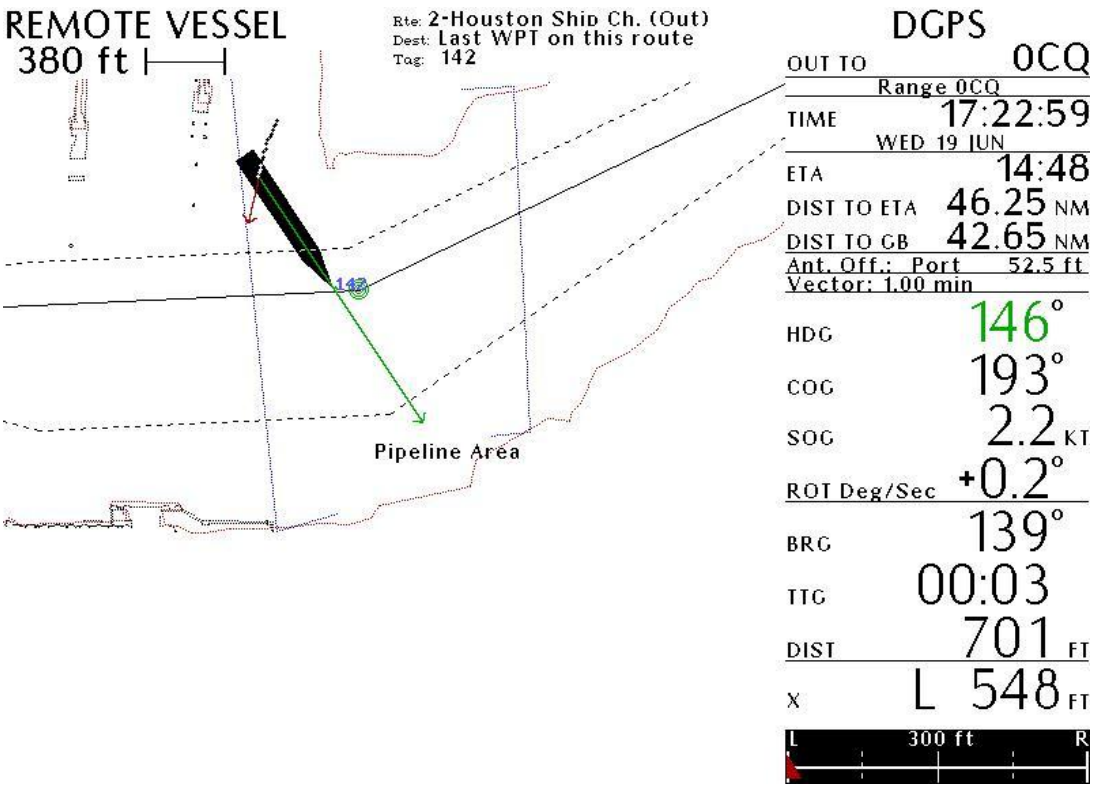


Figure 8: Wheelhouse Chart Screen

14 Remote Vessel [F3] Operational Status Screen

This Wheelhouse/IP screen shows all operational status of the remote vessel, except the individual GPS satellite data, which is currently too much data to be transmitted.

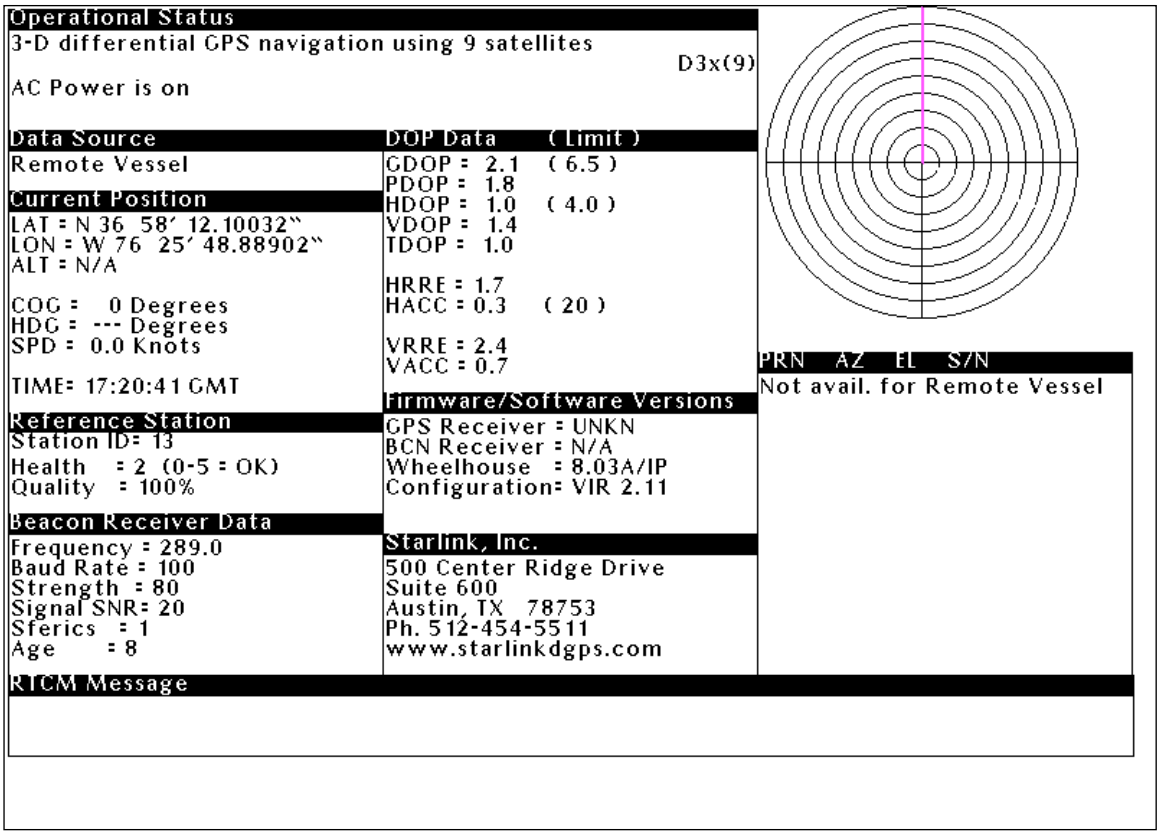


Figure 9: Wheelhouse/IP Operational Status [F3] Screen, Remote Vessel

NOTE

This screen is not available in WH II for a remote vessel. In WH II the F3 screen always pertains to the local vessel.

15 Local Vessel Operational Status Screen

When viewing the Wheelhouse/IP Operational Status [F3] Screen for your own vessel, full operational status, including satellite data, is displayed.

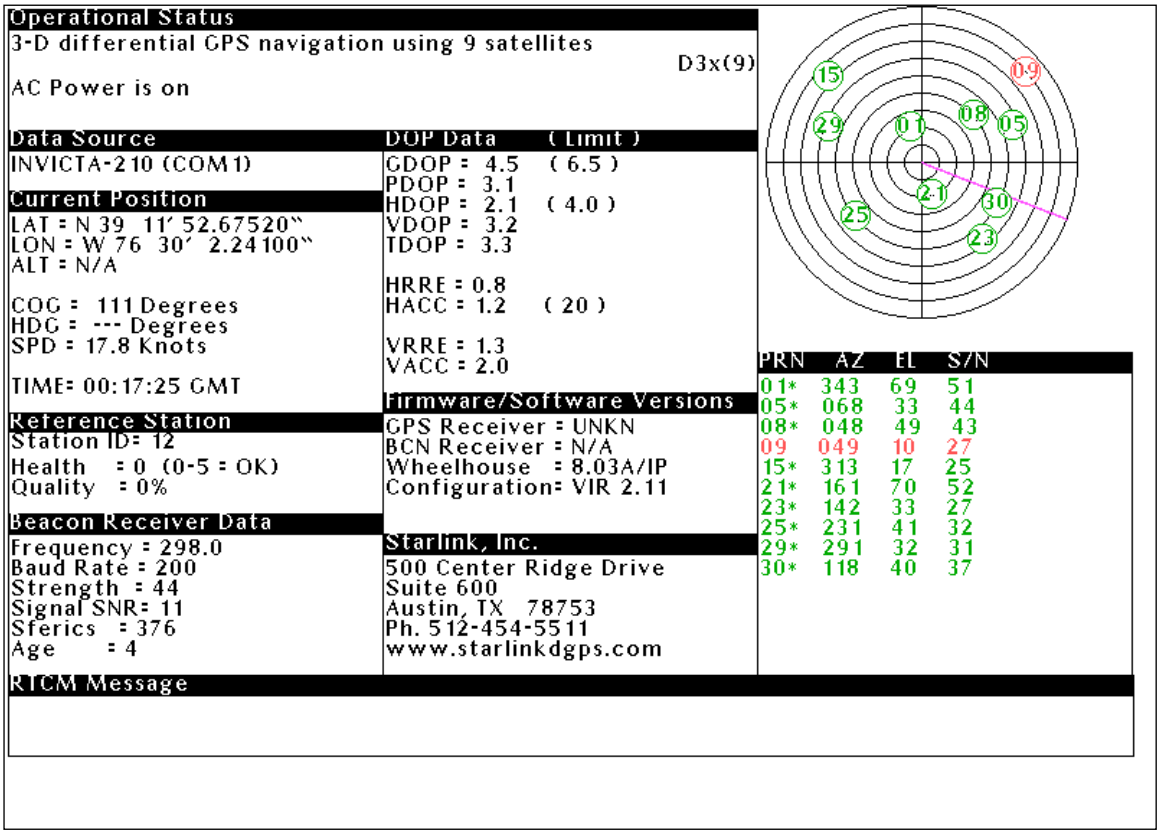


Figure 10: Wheelhouse/IP Operational Status [F3] Screen, Own Vessel

16 WH II Displaying Local and Remote Vessels

WhIP and WH II can display both SEND and AIS remote vessels. Below is the chart [F1] screen of WH II displaying the local vessel and 2 AIS remote vessels.

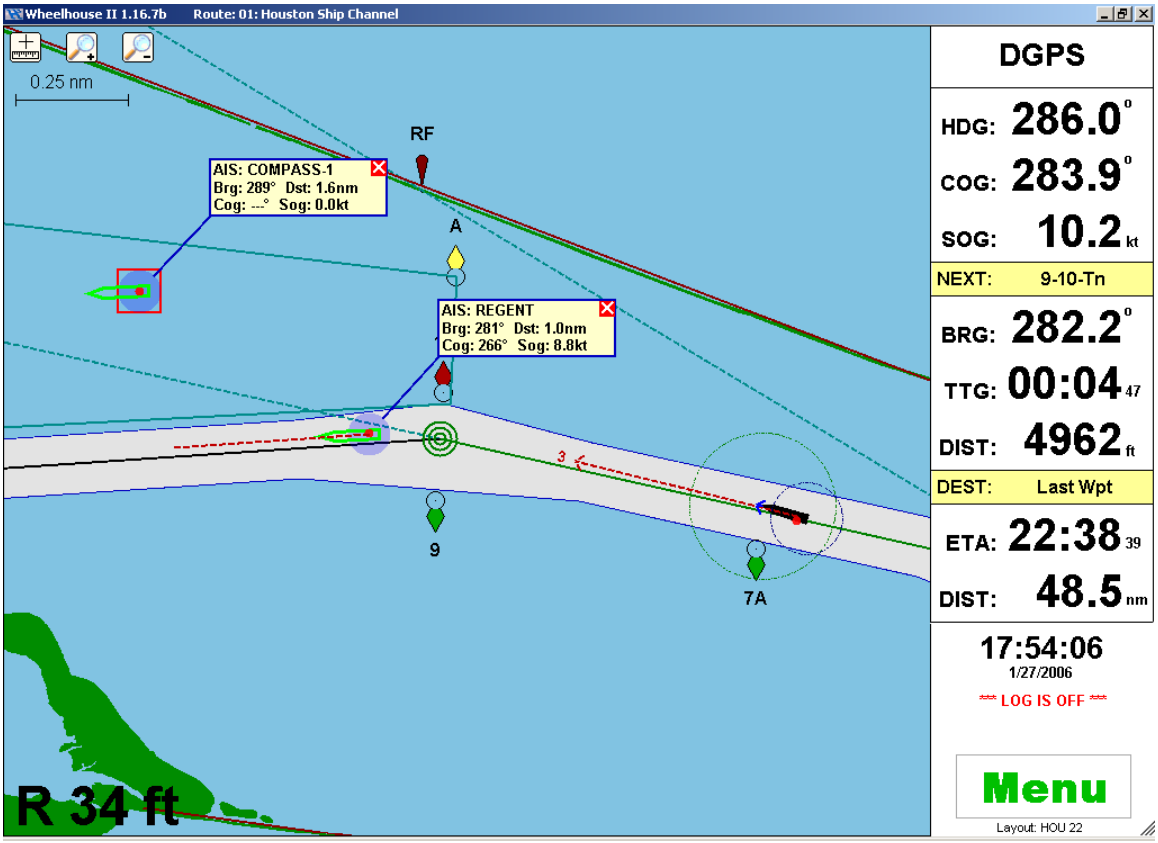


Figure 11: Wheelhouse II Chart [F1] Screen

17 SEND Server Display

The SEND Server Display is similar to the SEND Client Display, except it does not have local vessel logging, it doesn't send data to WhIP, and it doesn't need a server address, since it is the server. If the Monitor is on, vessel info received from SEND Clients is forwarded to a SEND Client used as a Monitor, as described in the next section.

If you want to see a remote vessel on a chart, you can run a copy of SEND Client configured as a monitor. It's best to run the monitor on a computer other than the one running the SEND Server.

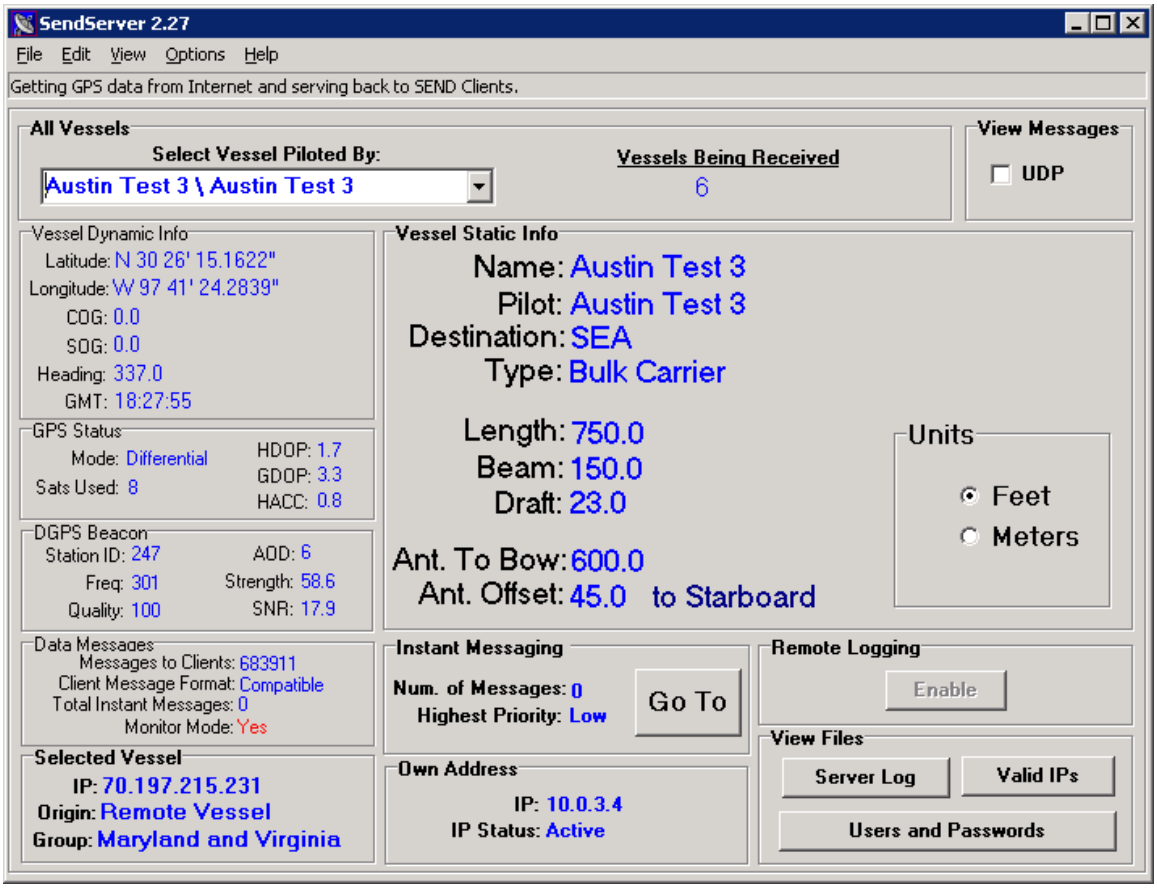


Figure 12: SendServer Screen

18 SEND Server Settings

This screen allows you to specify the address of a SEND Client that will be used as a monitor. When 'Monitor Transmissions' is set to 'On', the SEND Server forwards received vessel info to the Monitor IP Address. The SEND Client should have the SEND OFF radio button selected.

Figure 13: SendServer Settings Screen

19 SEND Server Log File

The SEND Server writes log records to sendserv.log in its load directory. Examples of records written are:

06-14-02 10:35:30 Start SendServer
06-14-02 10:35:46 Number of instant messages: 0
06-14-02 10:35:46 Stop SendServer

The SEND Server counts the instant messages. It also logs individual instant message events, but never the contents of the message.

06-20-02 11:29:06 From: Tony in Austin 192.168.90.61, To: 166.143.60.14
06-20-02 11:30:45 From: 141 166.143.60.14, To: 192.168.90.61

You can tell that instant messages were exchanged between 2 parties, and the time and date. On purpose, you cannot tell what was said.

20 Setting Up a SEND Server

In the SendClient Settings dialogue box, note the Server IP Address. This is the IP address to which the Send Client sends its own vessel information and from which it gets other vessel information.

To set up a SEND server, you must run the SEND Server on a computer that has an 'always on' Internet connection. Then enter the IP address of the SEND server into the Server IP Address of each SEND Client.

If the SEND Server has a firewall, which it probably does, its IP address is not directly exposed to the Internet. In this case, for the 'Server IP Address' field on the SEND Client enter the LAN router IP address, and then instruct the LAN router to route all Port 3000 messages to the SEND Server's address on the LAN.

You can use the SEND Server at Raven's Austin Technology Center (ATC), in Austin, Texas, but it is not guaranteed to always be available, and is not currently dedicated to a particular pilot group. The long term goal is for users to operate their own SEND Servers, while allowing Raven access to their SEND Server to provide tech support and to assist with SEND development.

21 The AIS Client Program

The AisClient program accepts AIS data via a serial com port or wirelessly via the Raven WPI. The Raven WPI (Wireless Pilot Interface) is a small hardware device that connects to the vessel's AIS Pilot Plug and transmits data wirelessly to the Raven laptop computer.

When AIS is available for a system, the charting program auto-launches AisClient, shown below. AisClient receives data from the Raven WPI, processes it, and relays it to SendClient. Typically, no user interaction is needed with this program, but the program does have the ability to record and replay log files containing raw AIS data.

The left lower window contains info for the local AIS vessel (VDO Message) and the right lower window contains info for remote AIS vessels (VDM Message).

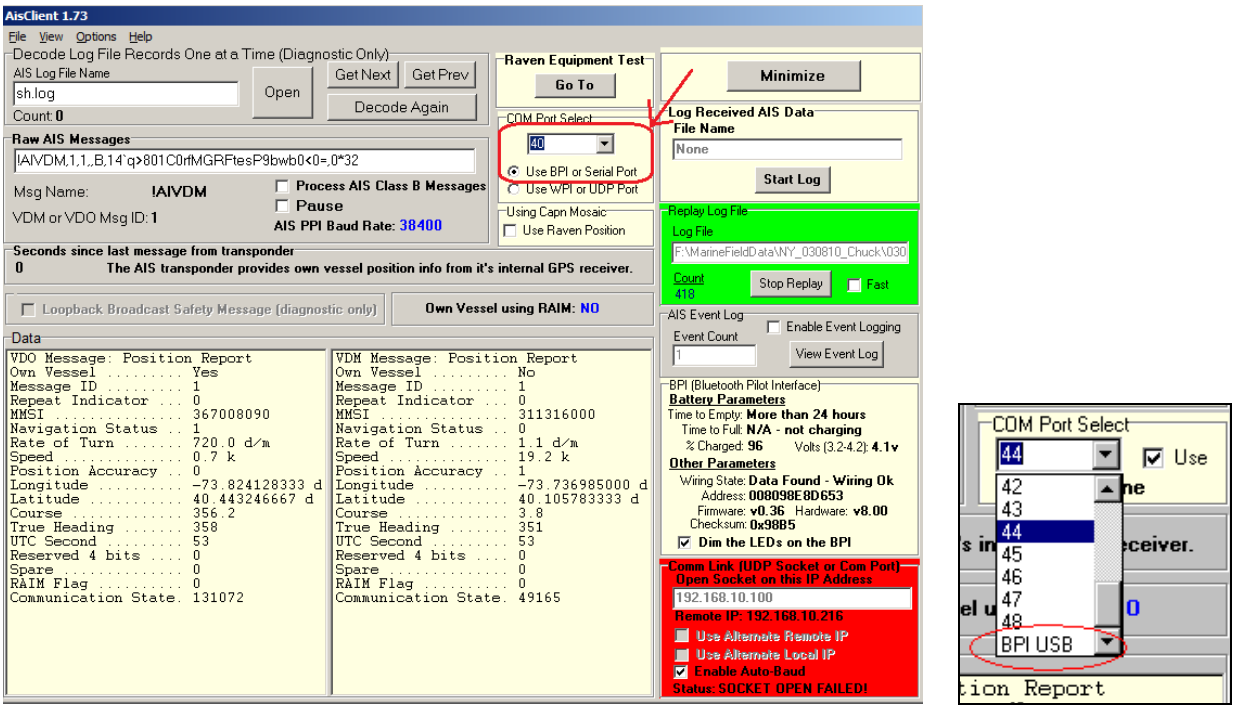


Figure 14: AisClient Screen COM Port Select Drop-Down List

If your system has a WiFi AIS pilot plug interface, then select 'Use WPI or UDP Port'. If your system has a hard-wired or Bluetooth interface to the pilot plug, then check then select 'Use BPI or Serial Port'.

If you want to connect to the Raven BPI (Bluetooth Pilot Interface) via the USB cable, select 'BPI USB' from the drop-down list, as indicated above, right.

The following pertains only to systems using the Raven WPI WiFi device. Note the checkbox labeled 'Enable Auto-Baud' in the lower right of the AisClient screen. When AisClient first starts, this checkbox is automatically checked so AisClient will search for data from the AIS transponder at the different baud-rate settings of the vessels Pilot Plug Interface connection. As long as there is no understandable data, AisClient tries a new baud rate every ten seconds. Baud rates tried are: 9600, 19200, 38400. When AisClient finds data, it automatically unchecks

‘Enable Auto-Baud’. The reasoning is that the baud rate has been determined and there is no need to re-scan, even if data stops due to unplugging the WPI, say, to re-position it. However, if the user would like to over-ride this behavior, the user can manually re-check ‘Enable Auto-Baud’, and AisClient starts the baud rate scan again.

22 Logging and Replaying Raw AIS Data

You can log raw AIS data to a log file by pressing 'Start Log'. You can replay this data by pressing 'Start Replay'. Because AisClient adds a date/time stamp, the data is replayed at a rate similar to the original rate at which AisClient received the data.

Note that raw GPS and raw AIS log files are stored in the home directory of the data set, not in c:\wh2logs. Examples of home directory: c:\HOU, c:\NY, c:\VIR, etc., depending on the pilot group abbreviation.

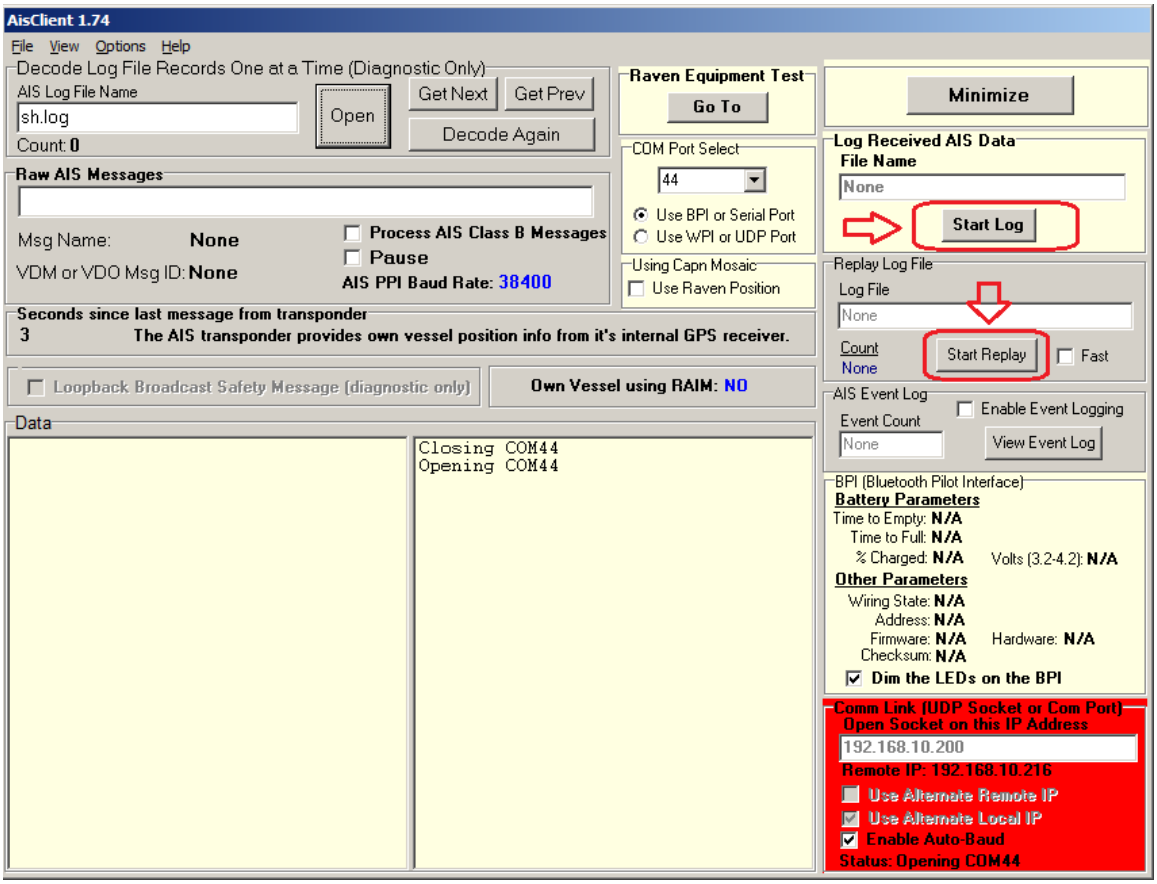


Figure 15: AisClient Screen; Start and Replay Log Buttons

23 AIS Data in the SendClient Vessel List

AisClient processes information for a given vessel and sends it to SendClient. For each AIS vessel, there is an entry in the SendClient vessel list, as indicated below. Note that each AIS vessel has the tag, 'AIS'. If the static data for a vessel has been received, then the vessel particulars, such as dimensions and name are known. If not, the MMSI is used in the list in place of the name, and the dimensions are defaulted to 1 meter by 1 meter. Vessel static information should be received within 6 minutes.

SendClient displays 'OWN' instead of 'AIS' for the local vessel information coming from the on-board transponder.

If the user wants to stop AIS data from being displayed by the charting program, they can uncheck 'Enable AIS Data' in the upper right corner of the SendClient screen. Re-checking this box causes SendClient to forward AIS data to the charting program.

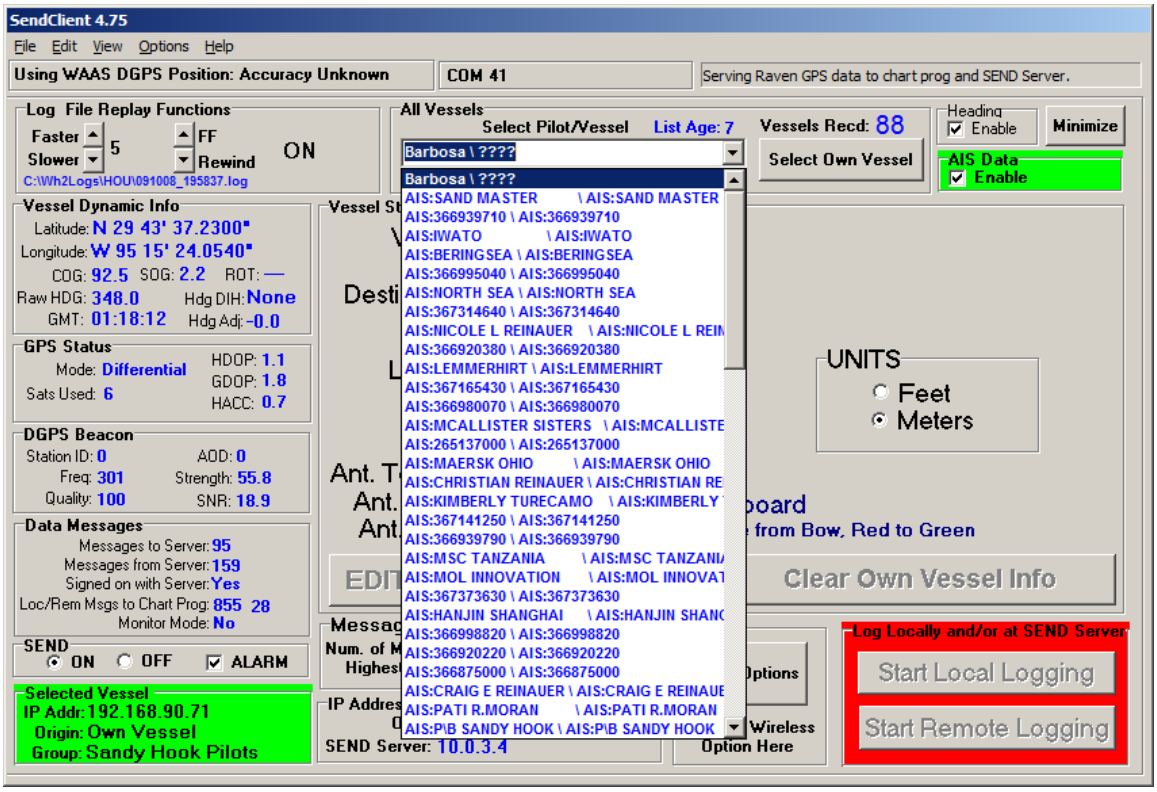


Figure 16: SendClient All Vessels List

The drop-down list displays an AIS vessel name with the prefix, 'AIS:', as indicated above. If the vessel static information has not yet been received (transmitted every 6 minutes), then the charting program displays the vessel's MMSI with the prefix, 'AIS:'.

24 Sharing AIS Data with Other Programs

NOTE

1) Capn Mosaic and Coastal Explorer are third-party charting programs, *not Raven products.*

2) You must run WHII in order to share data with third-party charting programs.

AisClient can send the full AIS data stream from the AIS transponder to Capn Mosaic and Coastal Explorer via TCP connections.

Aisclient contains a TCP server that serves data to TCP clients. Capn Mosaic and Coastal Explorer can both be configured as TCP clients. AisClient can serve AIS data to Capn Mosaic and Coastal Explorer simultaneously, if desired, but this might load down the laptop CPU. To see the TCP Server, go to the AisClient main screen and then click on 'View | TCP Server'.

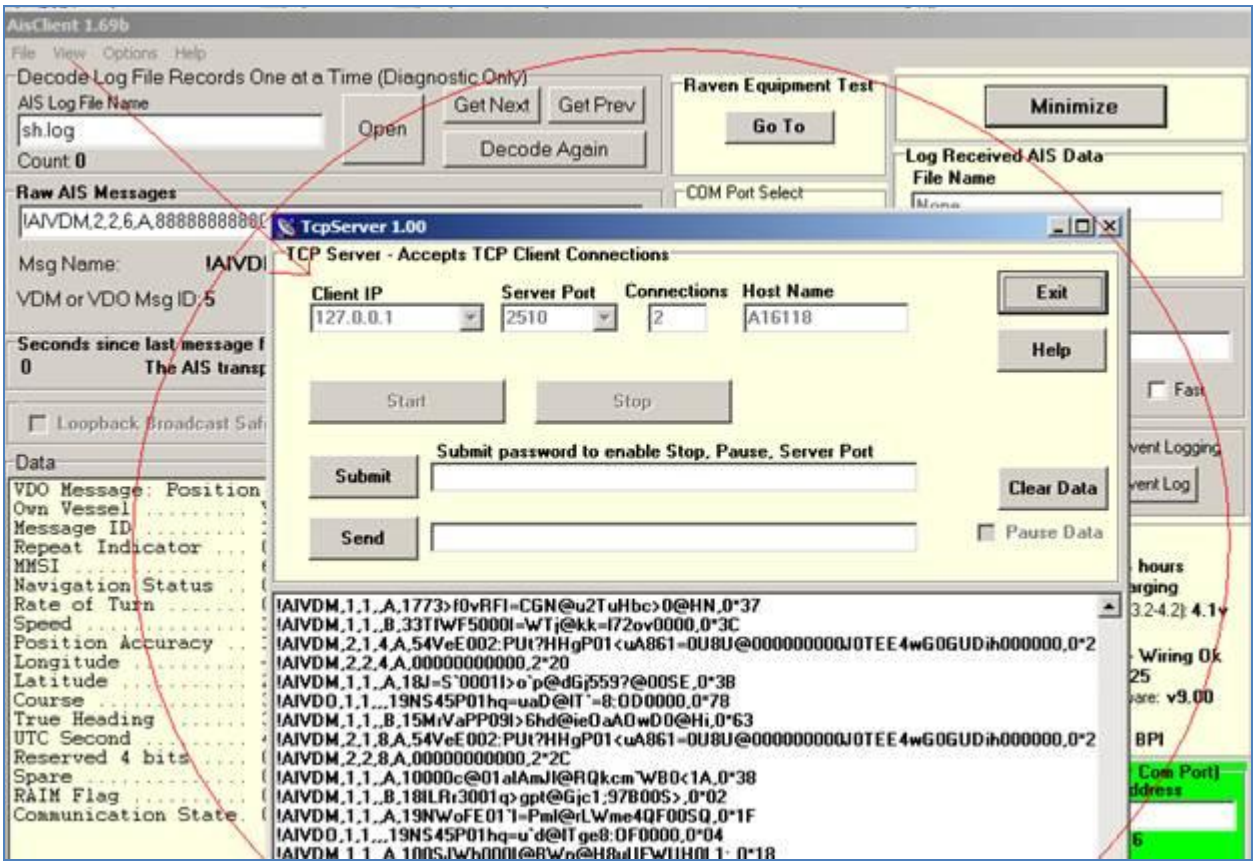


Figure 17: TcpServer Screen for AisClient

24.1 Capn Mosaic Operational Behavior

When Capn Mosaic is getting AIS data from the TCP connection, it uses the AIS own vessel position rather than the Raven Pilot System position. However, if Capn Mosaic is also getting Raven GPS data from SendClient, it uses the SendClient vessel static info and displays the Raven GPS operational status in the Capn Mosaic title bar, even though it is using the AIS own vessel position. We would like Capn Mosaic to use the Raven GPS position whenever it is present, but we no longer have a development relationship with the Capn Mosaic producers since Dennis Mills sold out to MapTech.

NOTE

See AisClient setting in next section that allows for the filtering out of AIS own vessel records when using Capn Mosaic.

24.2 Configuration of Capn Mosaic

For Capn Voyager you must select the settings as indicated below. Technically, the MMSI value should be your own vessel, but **must not be 999999999** (I use 123456789, see below). Also, **you must check 'AIS | Display AIS Targets'**.

NOTE

Capn Mosaic release notes indicate that putting in own vessel MMSI will cause the behavior below, but that does not occur when the AIS data source is via TCP. So using 123456789 and leaving it seems the best way to handle this.

From Capn Mosaic release notes:

Version 8.2.0.5 - 25 August 2005

Added AIS MMSI number field to the AIS setup screen so the ship's own AIS reports will not be processed by the Capn's AIS target display sub-system.

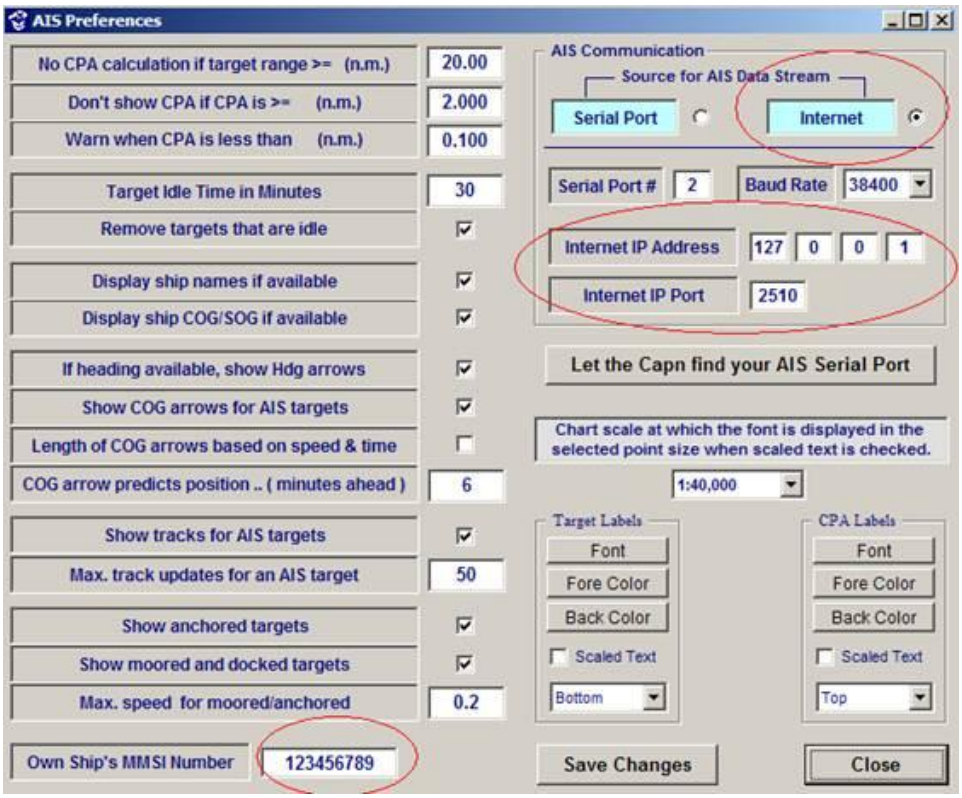


Figure 18: AIS Preferences

25 Coastal Explorer Operational Behavior

Coastal Explorer only uses one vessel data source, either the TCP connection or a COM port. When Coastal Explorer is getting AIS data from the TCP connection, the own vessel position is the AIS own vessel position. You cannot display the Raven GPS position on the Coastal Explorer chart. (You can display the Raven GPS position on the Capn Mosaic chart.)

26 Configuration of Coastal Explorer

Select 'Tools | Options | Instruments | Port Settings | Add Network Port…' and **type in 127.0.0.1:2510**.

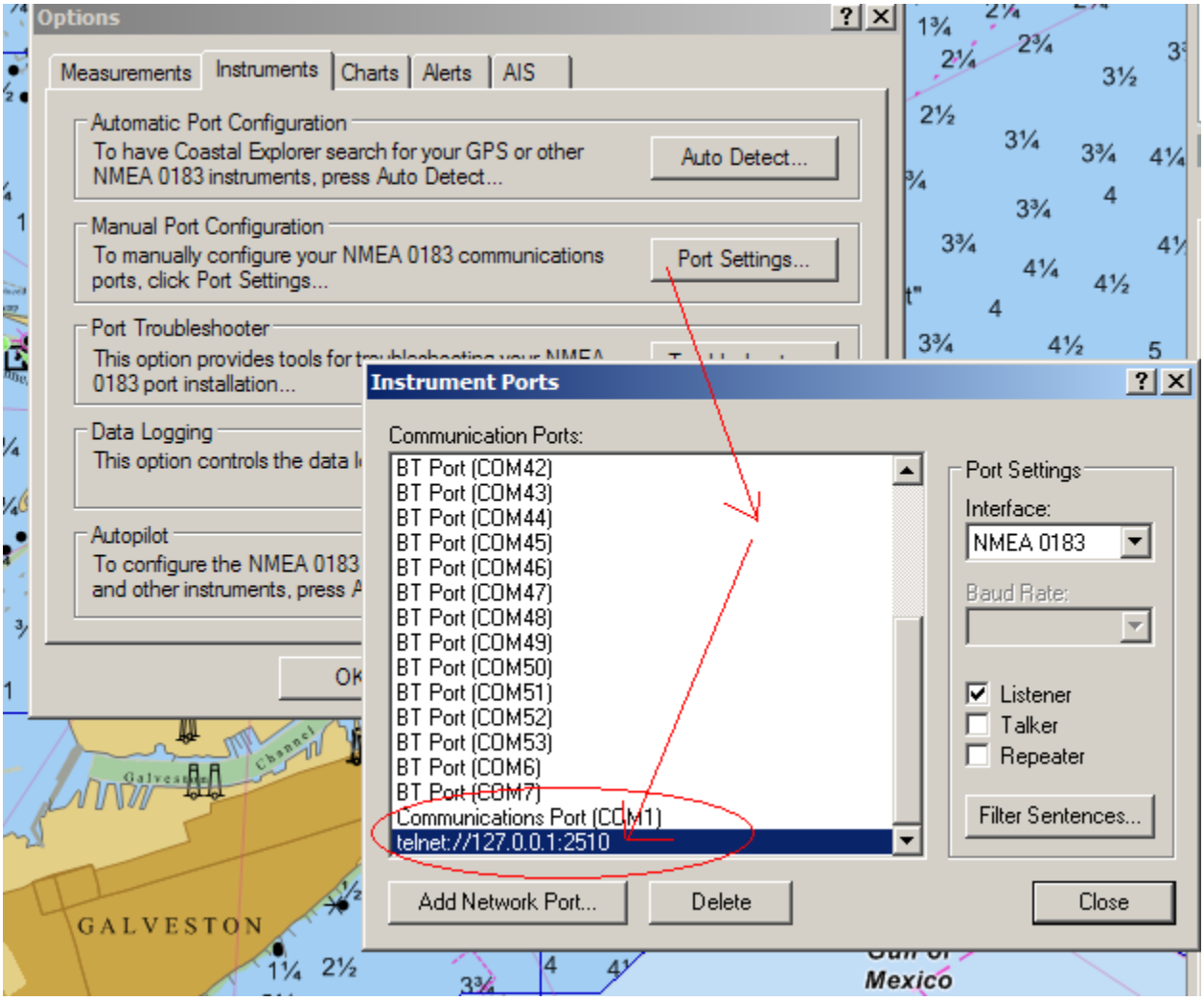


Figure 19: Adding a Network Port for Coastal Explorer

27 Filter Out AIS Own Vessel If Using Capn Mosaic

There is a checkbox on AisClient 1.70 that, when checked, excludes AIS own vessel records from the AIS data stream being sent to Capn Mosaic. This causes Capn Mosaic to use the GPS position coming from the Raven GPS receiver. If you change this setting in AisClient, restart Capn Mosaic to get Capn Mosaic to properly adapt to the presence or absence of AIS own vessel records. So if you are using your Raven DGPS system, check the box. If not, uncheck the box. AisClient saves the state of the checkbox for the next time it starts.

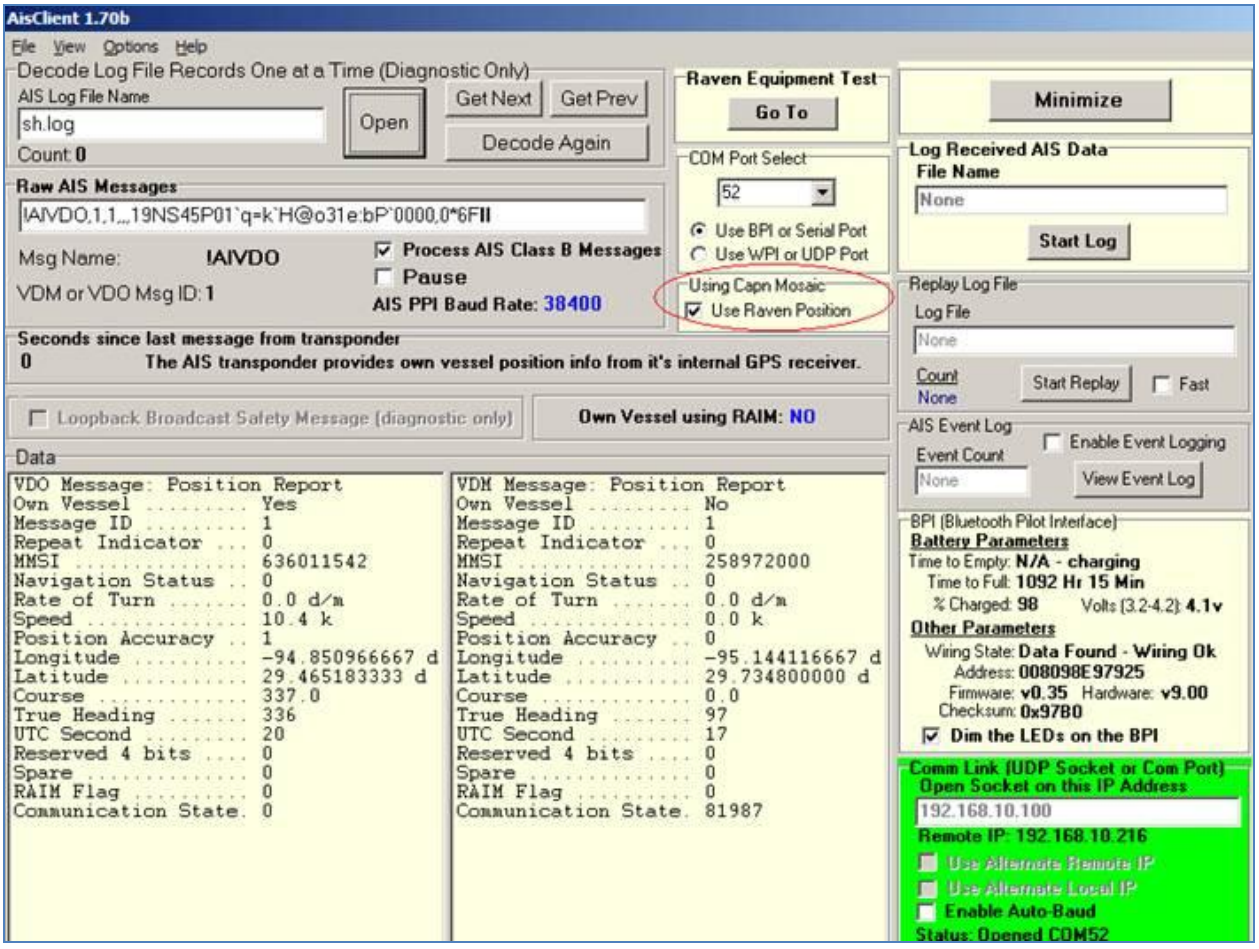


Figure 20: AisClient Screen with Capn Mosaic Check Box Identified