TSUNAMIS NAVIGATOR

USER MANUAL

This document contains:

SYSTEM REQUIREMENTS FOR TSUNAMIS NAVIGATOR SOFTWARE

System Requirements for Tsunamis Navigator System

ATTENTION!

For the warranted operation of the ECS Tsunamis Navigator, you should carefully study the system requirements for the computer which the TN will be installed in. If the computer system requirements differ essentially from the recommended ones, the TN installation will be interrupted by the installation program.

- HARDWARE:
  CPU: Pentium, recommended PIII - 450 MHz or higher;
  RAM: 64 Mb minimum (128 Mb recommended);
  Video adapter:
  Resolution: 1024x768 (minimum),
  Color depth: High Color (16 bit),
  Memory: 4 Mb or more;
  HDD: 1 Gb free disk space;
  I/O devices: CD-ROM, 3.5" FDD (recommended);
  Communications:
  Active Parallel port (LPT) or USB port,
  COM port(s).

- SOFTWARE:
  Operating system:
  Microsoft Windows 98 Second Edition or
  Microsoft Windows 2000 (SP 2) or
  Microsoft Windows NT v.4.0 (SP 5);
  Microsoft Internet Explorer v.5.0 or later.

- ADDITIONAL REQUIREMENTS FOR THE WEATHER MODULE:
  Microsoft Outlook 98 or 2000,
  Outlook Express v.5.5 or later.

ATTENTION!

The TN operation does not permit the setting of any other fonts but small fonts. If you have any problems with the display of information on the TN screen, check the font setting on your computer. To do this, open Settings page in Windows Control Panel/Display and set the small fonts.

PS: Requiring to insert OS WinXP in the picture.

OPERATION LAYOUT OF DIFFERENT TN VERSIONS

Tsunamis Navigator Demo, Standard and Professional

ATTENTION!

Installation of Tsunamis Navigator system will automatically replace the Tsunamis'99 system if the latter was installed on the same computer. As this is done, chart installed in the Tsunamis'99 will remain available for use in Tsunamis Navigator system.

Tsunamis Navigator electronic chart system may have one of the three levels. Provided below is a table which contains information on the TN requirements for different levels. Tide&Current functionality is optional for TN Standard and TN Pro levels.

Level:	**Tsunamis Navigator DEMO**	**Tsunamis Navigator Standard**	**Tsunamis Navigator PRO**
Dongle	-	+	+
License Tsunamis Navigator Pro	-	-	+
License Tide & Currents	-	Optional	Optional

Depending on ECS Tsunamis Navigator level, the following utilities are available:

Utility:	**Tsunamis Navigator DEMO**	**Tsunamis Navigator Standard**	**Tsunamis Navigator PRO**
Tsunamis Navigator	+	+	+
Chart Catalogue	+	+	+
Configuration	+	+	+
Playback	-	-	+
Navtex Receiver	-	-	+
Navtex Viewer	-	-	+
Weather Forecast Manager	+	+	+

Depending on the set level, the TN can use the following panels:

Panels:	**Tsunamis Navigator DEMO**	**Tsunamis Navigator Standard**	**Tsunamis Navigator PRO**
Main	+	+	+
Dual	-	+	+
Info	+	+	+
Monitoring	-	+	+
Ship Position	-	+	+
Route Monitoring	-	+	+
Navigational Alarms	-	-	+
Config	+	+	+
General	+	+	+
Weather Parameters Settings	+	+	+
Time Zone	+	+	+
Tasks	-	+	+
SAR	-	-	+
Tides	-	Optional	Optional
3D	-	-	+
Names	-	+	+
LogBook	-	-	+
Add Info	-	+	+
Route	+	+	+
Calculations	_	_	+
Extra	+	+	+
Chart	+	+	+

For the TN's different levels, the use of the following navigation sensors is possible:

Sensors:	**Tsunamis Navigator DEMO**	**Tsunamis Navigator Standard**	**Tsunamis Navigator PRO**
Positioning System (PS)	NO	YES	YES
Time (from PS)	NO	YES	YES
Gyro/Magnetic Compass	NO	NO	YES
Log	NO	NO	YES
Wind Sensor	NO	YES	YES
Echo Sounder	NO	YES	YES
Temperature sensor	NO	NO	YES

Sensors:	Tsunamis Navigator DEMO	Tsunamis Navigator Standard	Tsunamis Navigator PRO
ARPA	NO	NO	YES
Yeoman digitiser	NO	NO	YES
Autopilot	NO	NO	YES

The following functionality is implemented in the Tsunamis Navigator Pro level only:

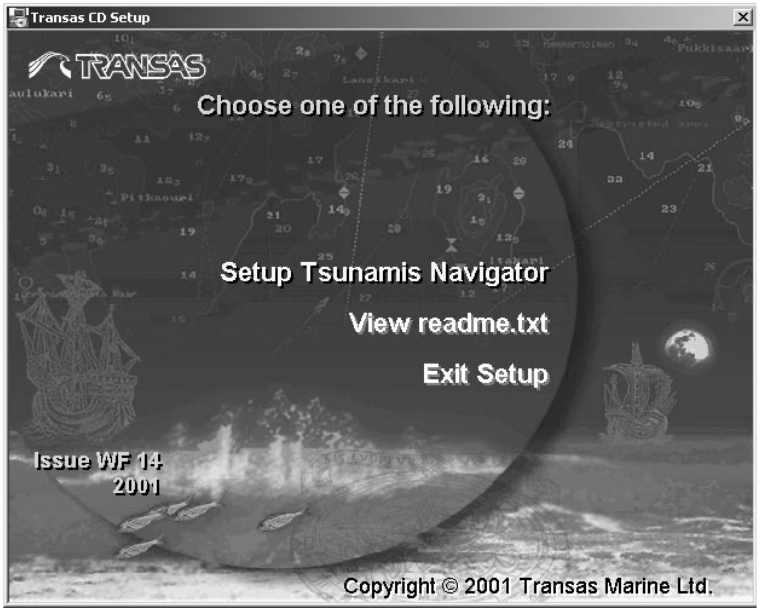
- passing of a route from the TN to an external device (GPS);
- re-calculations of directions from true to magnetic and the other way round;
- creating and editing of route schedules;
- creating and editing of SAR (Search And Rescue) routes;
- display of information on the seabed topography in the three-dimensional form (3D);
- operation with external NAVTEX receiver;
- setting of safety parameters (Navigational Alarms) which, when exceeded, generate an alarm;
- playback of archive data on the Chart Panel (Play Back);
- use of external navigation aids (ARPA, autopilot, compass, log, digitiser, etc.);
- dead reckoning mode.

INSTALLATION GUIDE

To install the TN, use the following procedure:

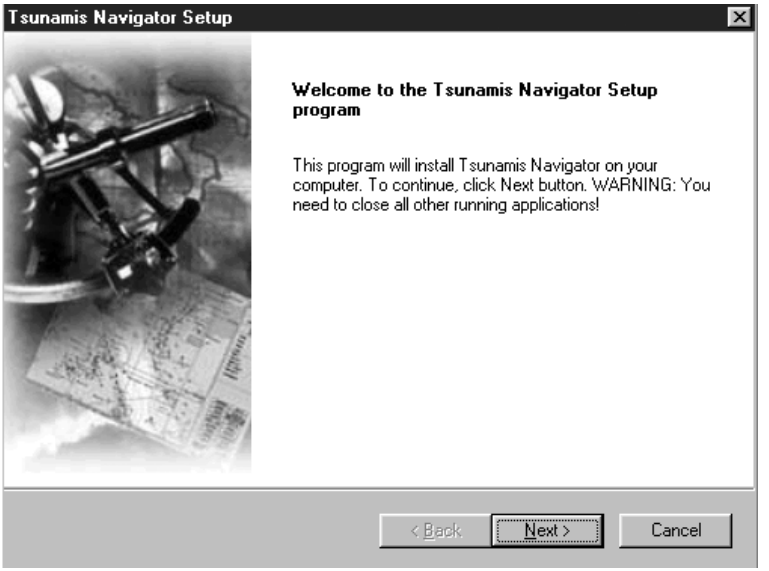
Start the computer.

Insert the installation CD in the CD drive.

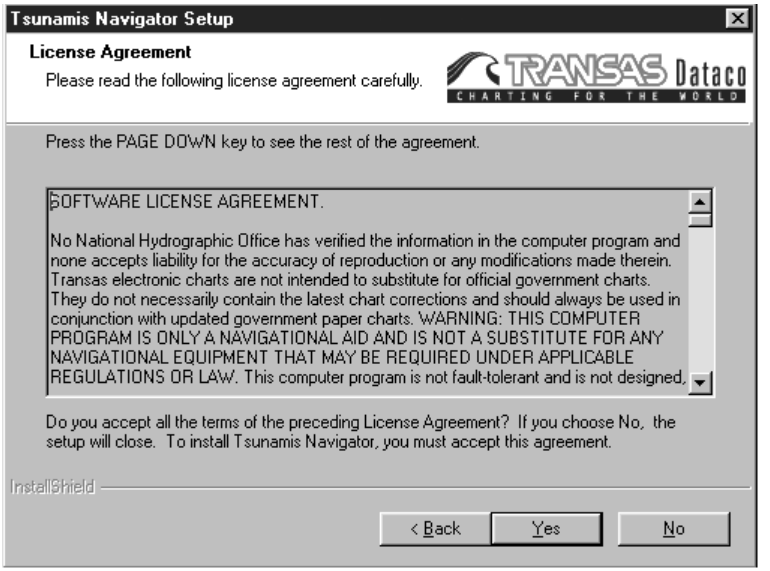


Select Setup Tsunamis Navigator menu item (before starting the TN installation, it is advisable to familiarise oneself with information provided by View readme.txt menu item).

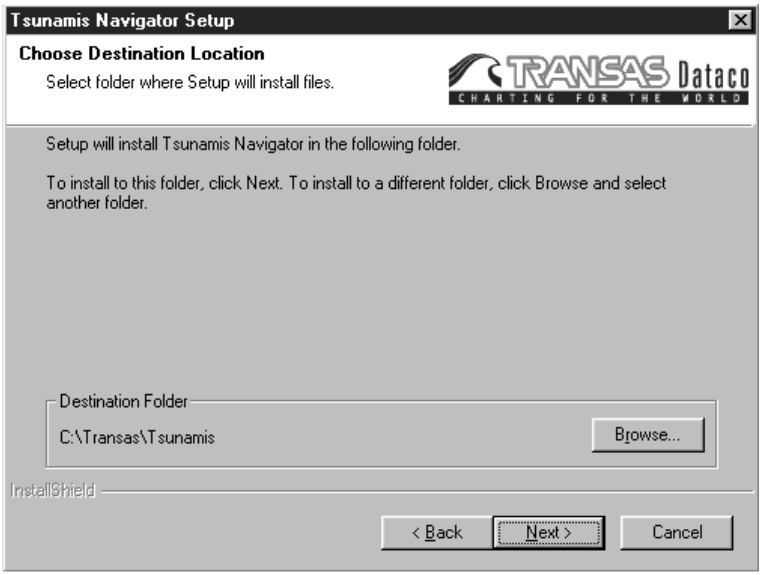
The TN will invite you to start the installation.



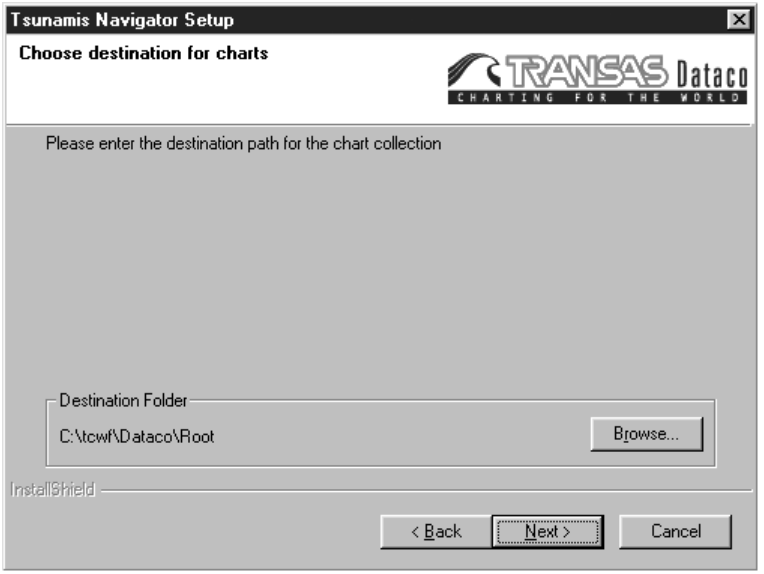
Press “Next” button: the screen will display and agreement which you should read carefully and, if you agree with its terms, press “Yes” button.



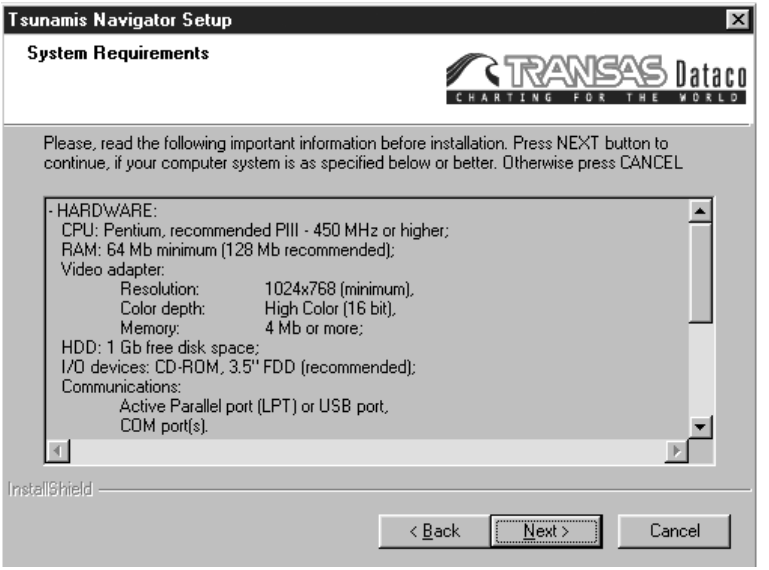
In the window which will appear specify the place on the hard disk where the TN program will be installed and press “Next” button.



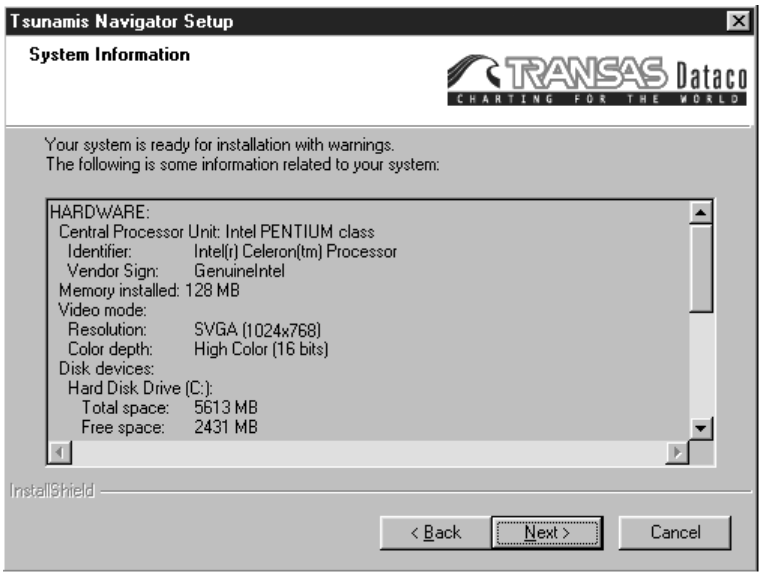
In the window which will appear, specify the place on the hard disk where the directory containing the chart folio to be used will be installed, press “Next” button.



Familiarise yourself with the system requirements for the computer which should be met for the TN program installation.



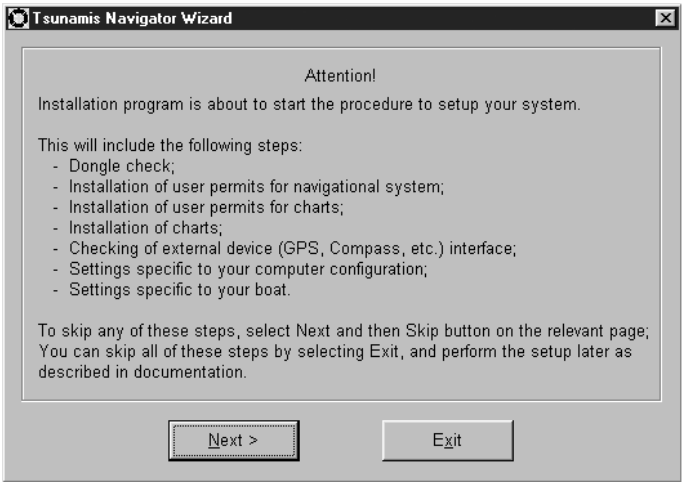
Press “Next” button and check that you computer actually meets the system requirements imposed on the computer for the program installation.



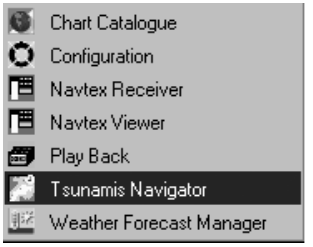
Press “Next” button. The program will perform the TN installation whereafter it will be necessary to restart the computer.

After the computer restart, the wizard program for the setting of parameters required for the TN operation will be automatically run. Press “Next” button to set the specified parameters or “Exit” to exit from the wizard.

These parameters can be set at any time in Configuration utility whose operation is described further in the Manual.



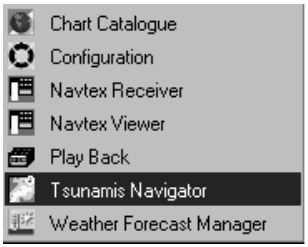
After the end of the wizard program operation, the TN installation on your computer is completed. The TN and utilities are run from the main menu. You will have Tsunamis Navigator Demo level set.



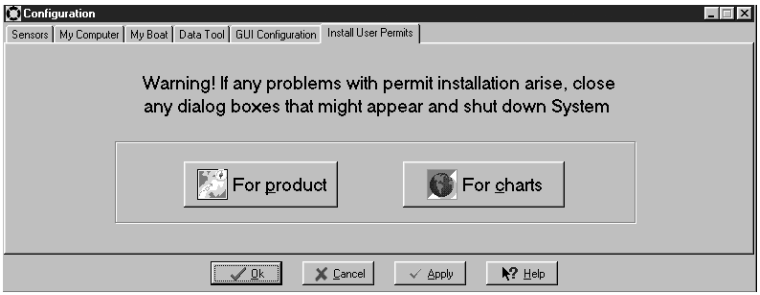
SETTING OF USER PERMITS

To set Tsunamis Navigator Standard level shut down the computer. Insert the appropriate security key in the LPT or USB computer port. Start the computer and run the TN from the main menu. Tsunamis Navigator Standard level will be installed on your computer.

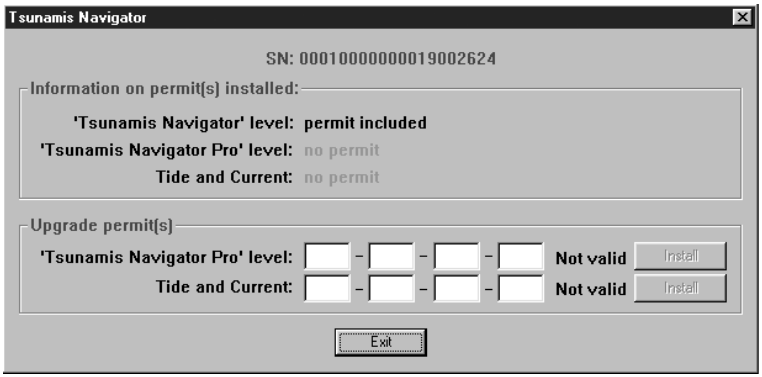
To set Tsunamis Navigator Pro level, enter Configuration utility from the main menu.



Open Install User Permits page and press For Product button:



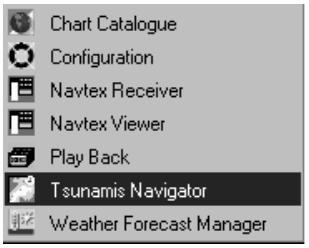
Enter the Tsunamis Navigator Pro permit in 'Tsunamis Navigator Pro' level box:



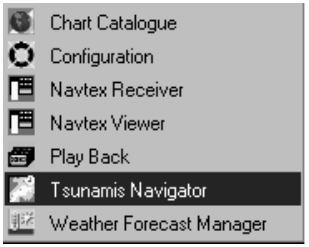
With the input of the correct permit, "Not valid" message to the right of the box changes to "Valid". At this stage Install button is activated; you should press 

button to install the permit. Information on permit(s) installed window will display "permit included" message.

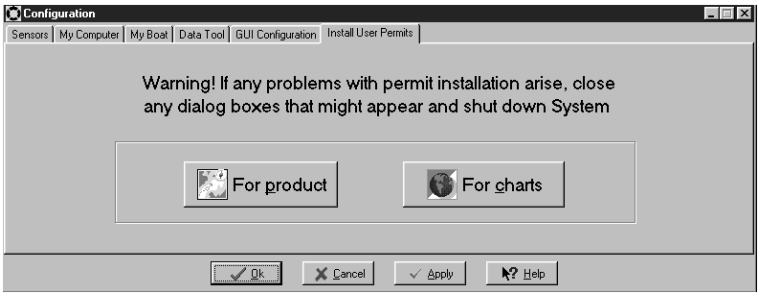
Exit from Configuration utility and run the TN from the main menu. You will have Tsunamis Navigator Pro level set.



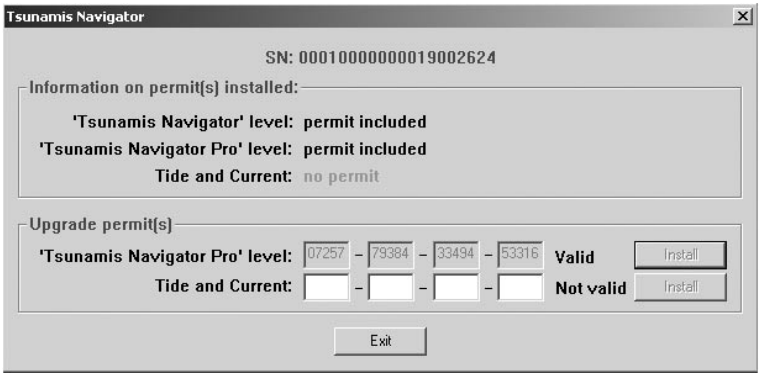
To set the permit for the use of the tide and current database, enter Configuration utility from the main menu.



Open “Install User Permits” page and press “For Product” button:



Enter the permit for the use of the tide and current database in Tide and Current box:



With the input of the correct permit, "Not valid" message to the right of the box changes to "Valid". At this stage 

button is activated; you should press this button to install the permit. Information on permit(s) installed window will display "permit included" message.

Exit from Configuration utility and run the TN from the main menu.

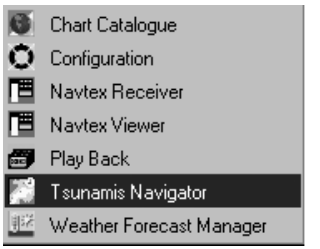
The selective installation of charts and chart catalogues depending on the need to use them, is made in Chart Catalogue utility.

CHART INSTALLATION

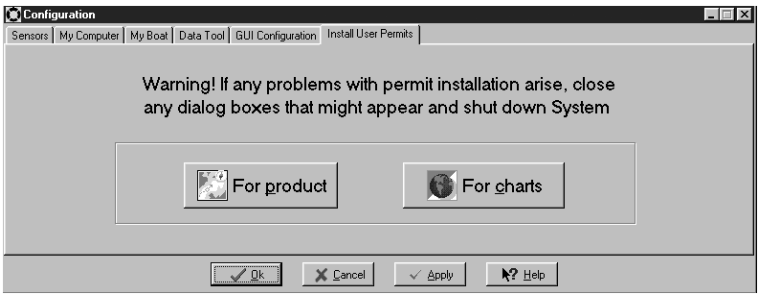
To be able to use electronic charts in the TN, you will have to install chart permits and then the charts from the WF CD.

To install all the licensed charts, use Chart Setup Wizard.

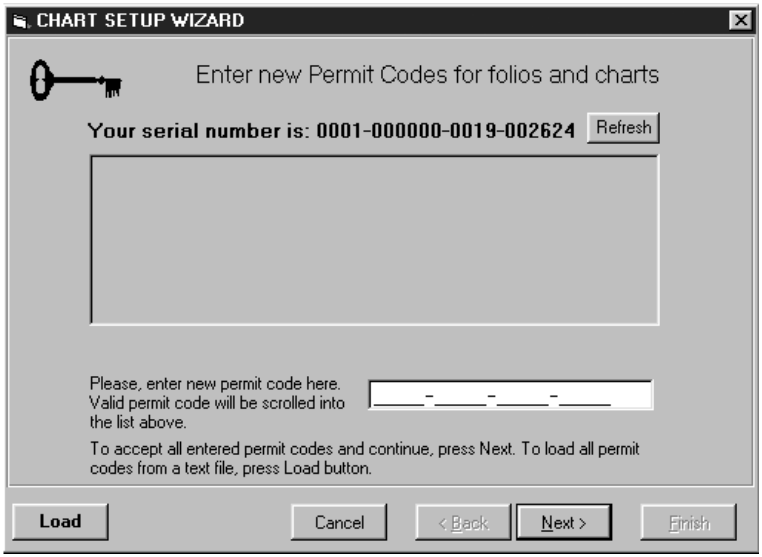
To start Chart Setup Wizard, run Configuration utility from the main menu.



Open Install User Permits page and press For charts button:



Enter the available chart permits in the input box. If permits.txt file supplied with the chart folio is available, press Load button and specify the path to permits.txt file. Permits will be loaded automatically.



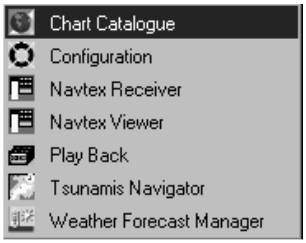
Press Next button; in the window which will appear specify the path for the scanning of the WF CD containing the chart folio (CD *Drive:\CHARTS\setup.id*). After the scanning of the CD, information on the WF CD issue number is displayed in the centre:

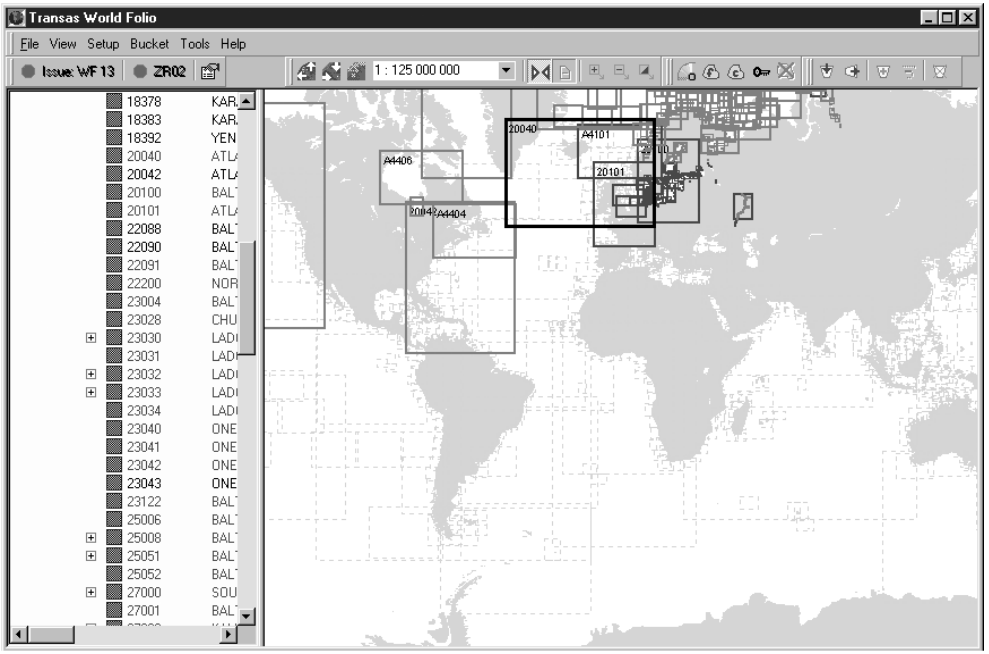
Press “Finish” button to start the chart installation. The TN installs all the charts which permits are available for.

Chart installation can also be performed from Chart Catalogue utility.

CHART ORDER

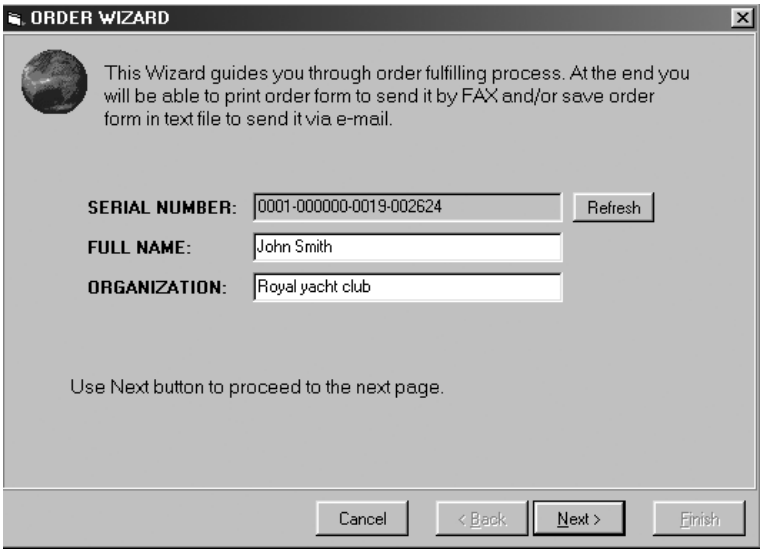
To order charts, enter Chart Catalogue utility from the main menu.



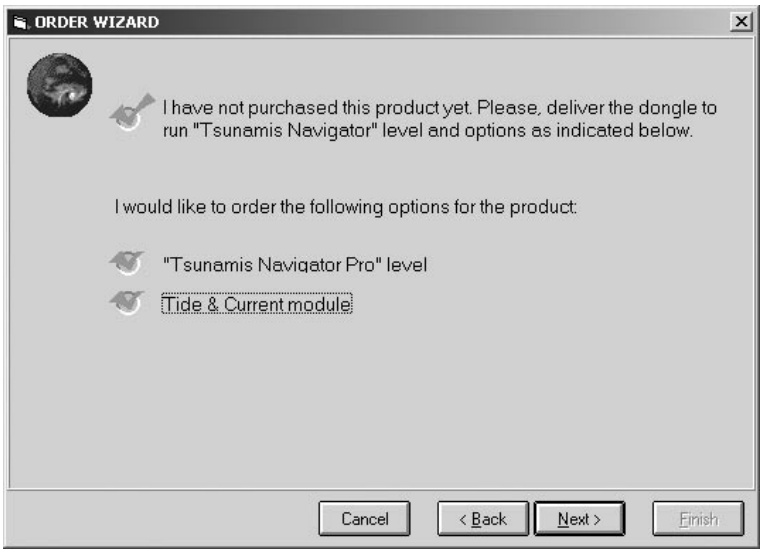


Select charts by using one of the procedures available in the TN. Put the selected chart in the bucket by pressing  button.

Press Tools/Order Wizard button in the main menu of the utility.



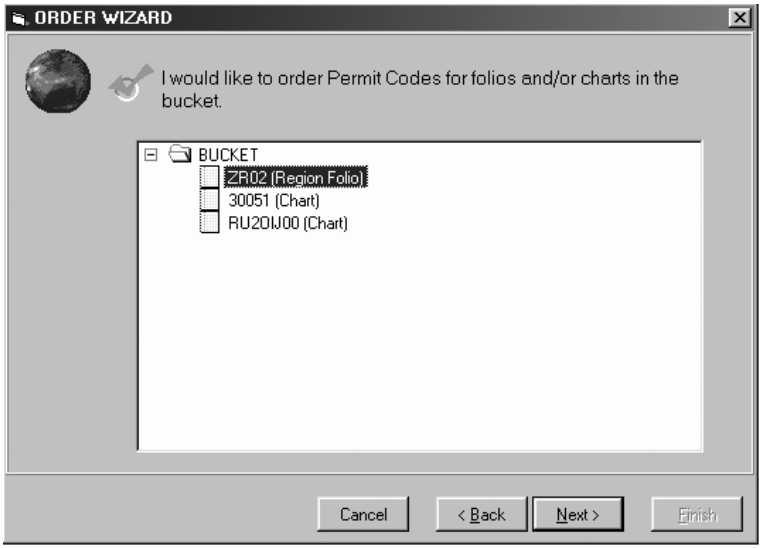
Enter your name and the name of the company (agency). Press “Next” button.



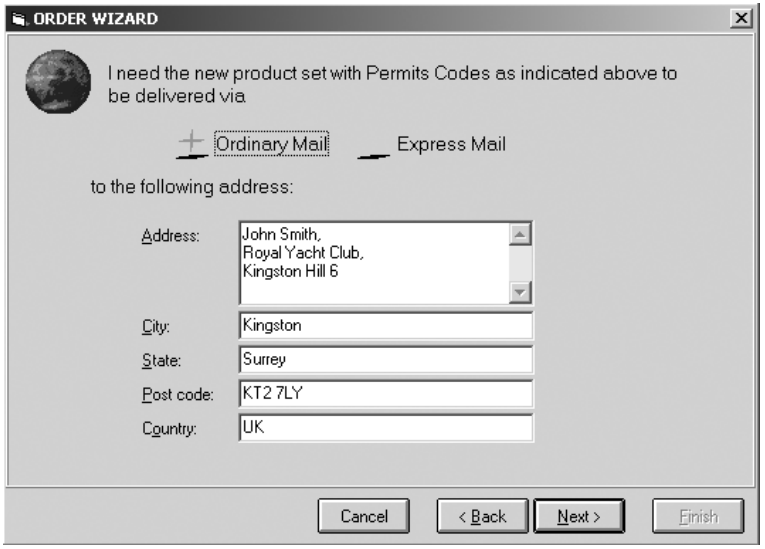
Specify the permits which you would like to order:

- "Tsunamis Navigator" level – security key for Tsunamis Navigator Standard level;
- "Tsunamis Navigator Pro" level – permit for Tsunamis Navigator Pro level;
- Tide&Current module –permit for the access to the tide and current database.

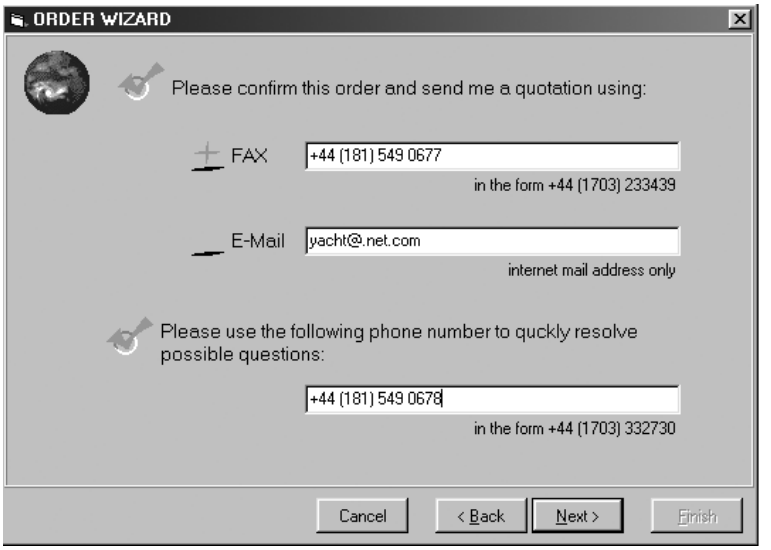
Press “Next” button.



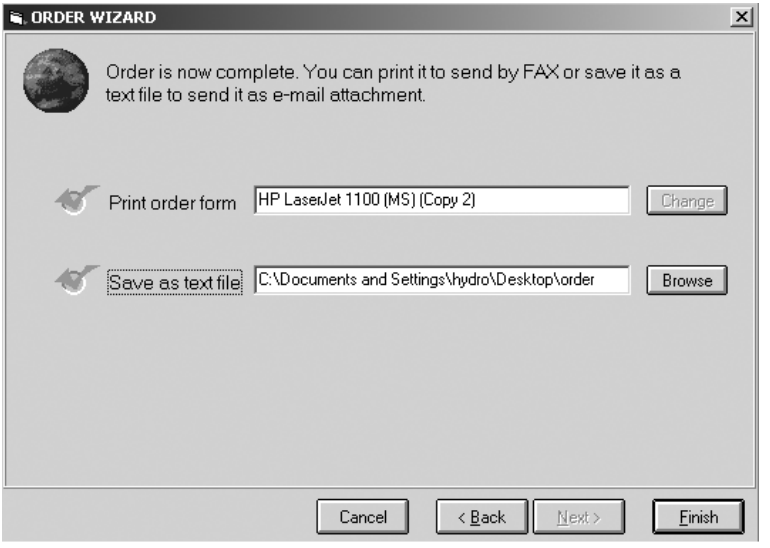
Select charts and/or folios which you would like to order from the bucket. Press “Next” button.



Specify the way of delivery to your address. Press “Next” button.



Specify your contact numbers to be used for the order confirmation and advising the cost of permits and charts you have ordered. Press “Next” button.

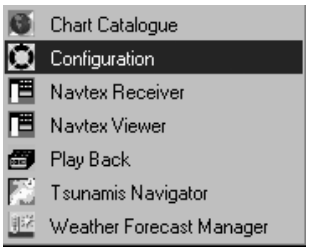


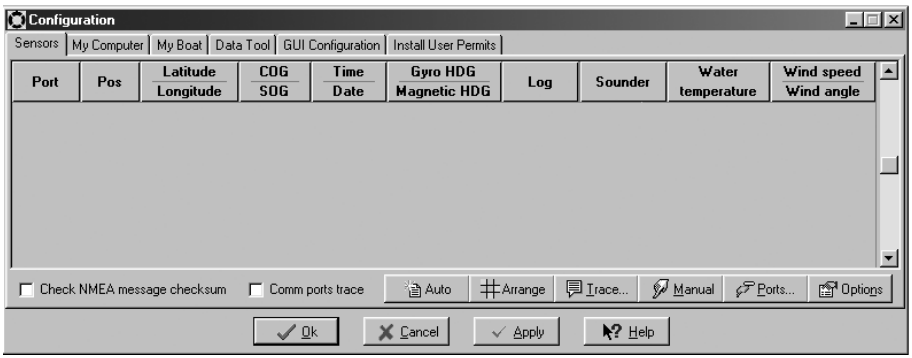
Specify the printer for the order printout (if the order is faxed). Save the order file to an electronic carrier (if the order is e-mailed). Press “Finish” button to exit from Chart Order Wizard.

CONNECTION OF EXTERNAL SENSORS

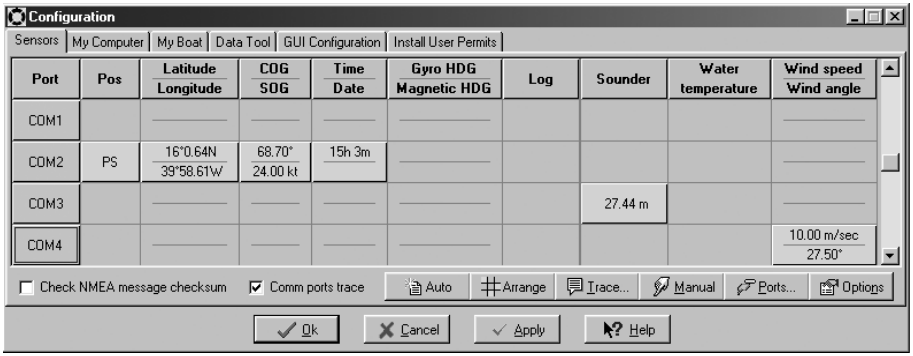
Connect outputs of the external devices to the computer serial ports (COM 1, COM 2, etc.) with RS-232C cable.

Start the computer, run Configuration utility from the main menu and open Sensors page.

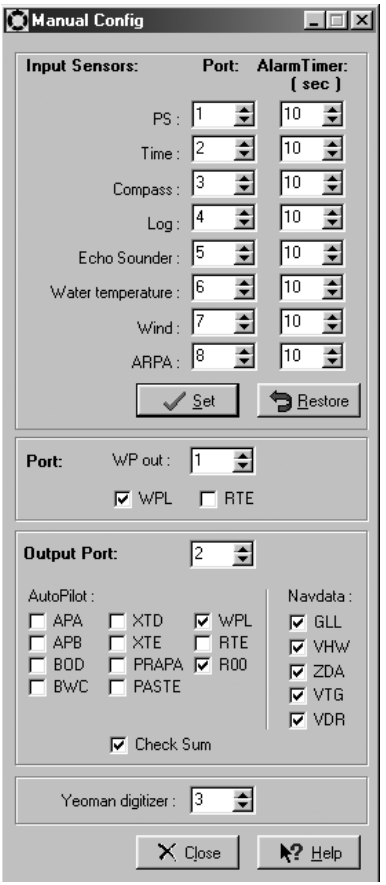




For the automatic connection of external sensors to the computer and automatic adjustment of serial ports, press “Auto” button. Check that the data supplied by the external sensors arrives for processing in the TN. Table cells containing this data should have a green background. If there is no green background in a cell containing the supplied data, make a double mouse click in the cell field.



If the external sensors (Input group) have not been detected when connected automatically, as well as when it is necessary to transmit data from the TN to different external devices (Output group) perform manual connection of external devices to the computer serial ports. To do this, press Manual button.



For the connection of external navigation sensors, set the serial port numbers next to each of the external sensors in use in the corresponding cells of Ports column in Input Sensors area. In Alarm Timer column set the alarm generation time in the absence of a correct signal from the external output device.

Press “Set” button.

To connect and external device (GPS) to the computer serial port used for the route transmission from the TN onto this device, set the port number in WP out box in Port area. Set the format of transmitted messages by checking WPL and/or RTE checkboxes.

For the connection of the autopilot set the serial port number in Output Port area. Set the format of transmitted messages.

For the connection of Yeoman digitiser, set the port number in Yeoman digitizer area.

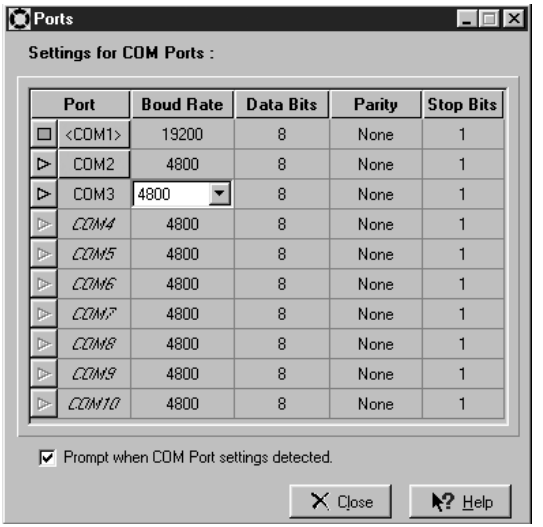
To disconnect any of the sensors, set the communication port number to zero in the required sensor box of Input Sensors area and press Set button.

Close Manual Config window by pressing “Close” button.

Assign external navigation sensors to the computer ports by double clicking the mouse on the required table cell, or by pressing Arrange button. After the assigning of the necessary sensors, data from the connected serial ports will be supplied to the TN.

For the manual setup of the computer communication ports, press Ports button. Set the data exchange parameters corresponding to your external device in the table cells.

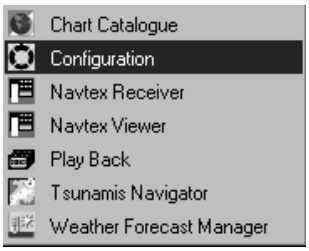
Confirm the settings made for the port by double clicking the left mouse button on the port name. The name of the set serial port is shown against the light blue background.

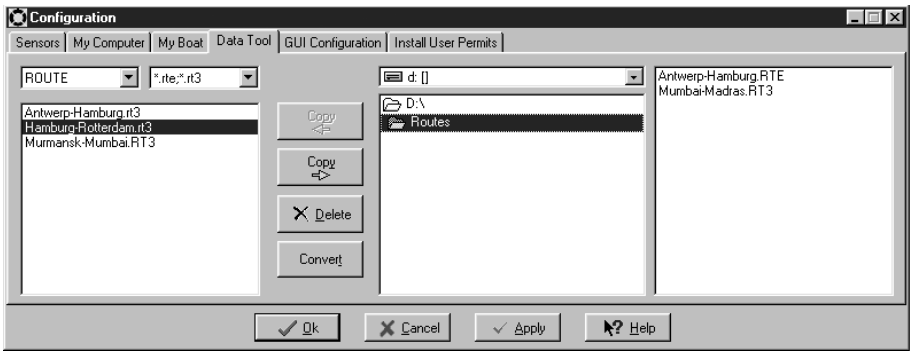


For the automatic setup of the computer serial ports, press ▷ button to the left of the port name. The button will acquire the form of □. Set the serial port by double clicking the left mouse button on its name.

HANDLING OR USER FILES

To handle user files, enter Configuration utility from the main menu and open “Data Tool” page.



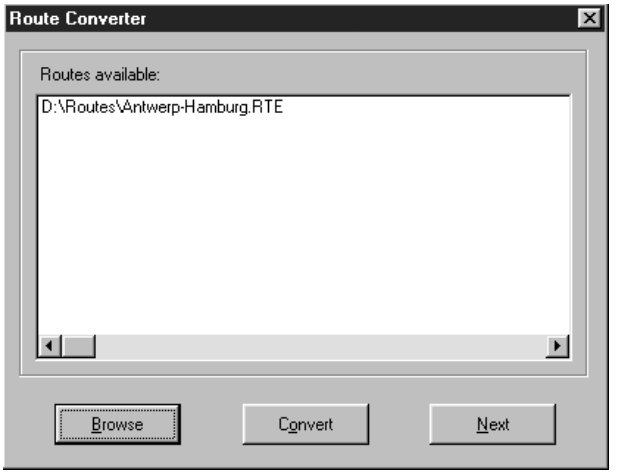


To copy TN files onto an external carrier, select a file in the left hand window. In the central window, select a folder on the external carrier which the file will be copied to. Press Copy button.

To copy files from an external carrier to the TN, select the file in the right hand window. Select the appropriate TM folder. Copy the file to the TN by pressing Copy button.

To delete files, select the file in the left hand or right hand window and press Delete button.

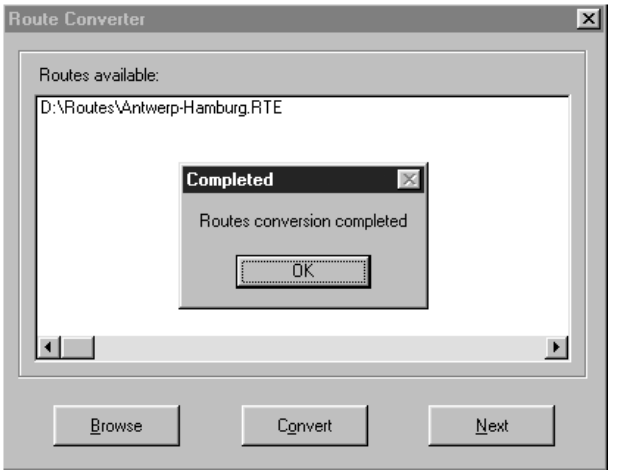
To convert files, press Convert button.



Select files on an external carrier, which are required to be converted. These are route file (`*.rte` extension) and user chart files (`*.cra` extension) which were used in the ECS Tsunamis'99.

Convert the file to the new format by pressing “Convert” button in “Route/AddInfo Converter” window.

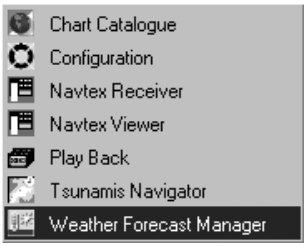
If the converting is successful, the program will display a confirmation.

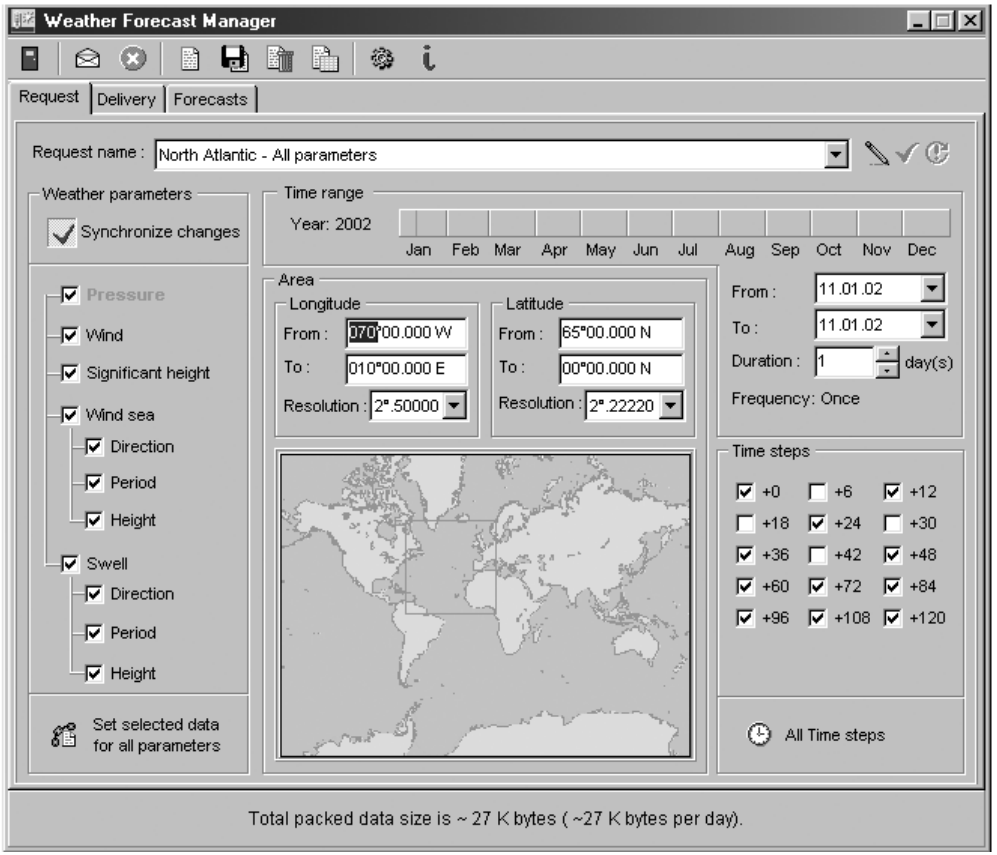


Press “OK” and “Next” in turn to exit from “Route/AddInfo Converter” window.

‘Weather Forecast Manager

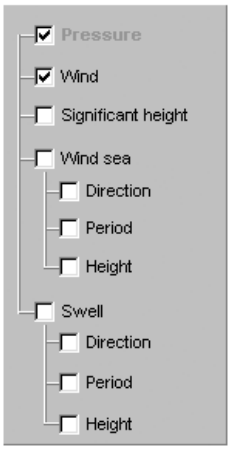
To order a weather forecast, enter Weather Forecast Manager utility from the main menu and open “Request” page.



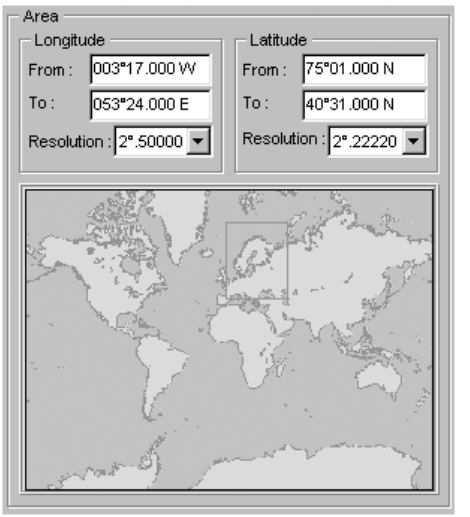


For the formation of a weather forecast order, use the following procedure.

Select weather parameters you would like to order by checking the appropriate checkboxes of Weather Parameters group (pressure and wind in this case).



Use Area group to set the geographic area which you wish to order weather forecast for, by using one of the two procedures:



Use Longitude From/To boxes to enter the latitude values of the area limits.
Use Latitude From/To boxes to enter the longitude values of the area limits.

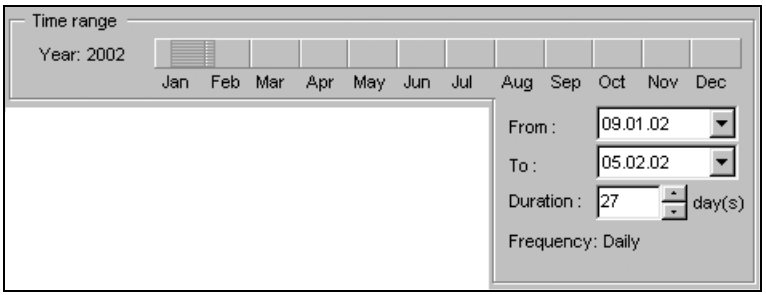
On the graphics panel, select the top left corner of the area by clicking the left mouse button, then the right bottom corner of the area by clicking the right mouse button.

Set the accuracy of the weather parameters display. To do this, set the resolution value in Resolution box by selecting a fixed value from the list. The selected resolution values set the distance intervals in latitude and longitude, over which values of the weather parameters you have selected will be provided in the ordered weather forecast. Weather parameter values in other points of the set geographic areas are calculated in the TN by the interpolation of data supplied in the weather forecast.

ATTENTION!

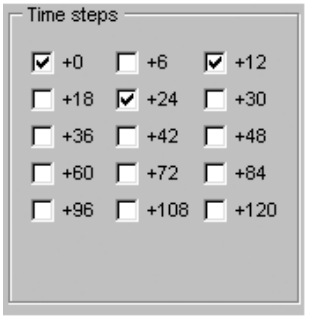
In case of a forecast order for small areas, it is necessary to select the minimum resolution for a more accurate display of weather forecast parameters.

In Time Range group, set the subscription term during which you wish to receiver weather forecast. This can be dome by using one of the following three procedures:



- set the term on the graphics panel keeping the left mouse depressed;
- enter the term beginning and end dates in From/To boxes;
- enter the start date and the term duration in From/Duration boxes.

Use Time steps group to set fixed values of time intervals in hours (from 0 to 120) relative to the start of the UTC date, over which forecast weather parameters will be supplied every day throughout the subscription term. The TN builds a weather model in which intermediate data is calculated by the interpolation of the received weather forecast.



This is where the formation of the weather forecast order is finished.

ATTENTION!

The WFM utility operates with the following mail programs only: MS Outlook 98, MS Outlook 2000, MS Outlook Express v.5.5 and higher.

To send the order to your mail program Outbox, press main menu button.

Send the order to the Transas Weather Server via Internet by using the mail program.

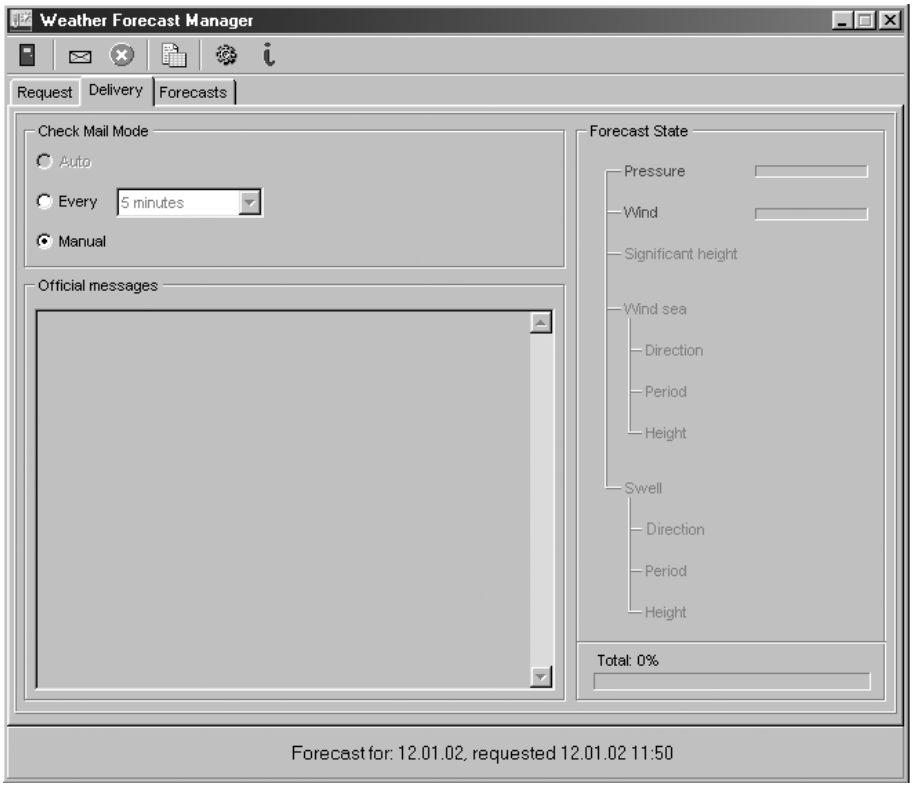
ATTENTION!

The recommended time interval between the despatch of the weather forecast order and a request for its reception should be at least 30 minutes.

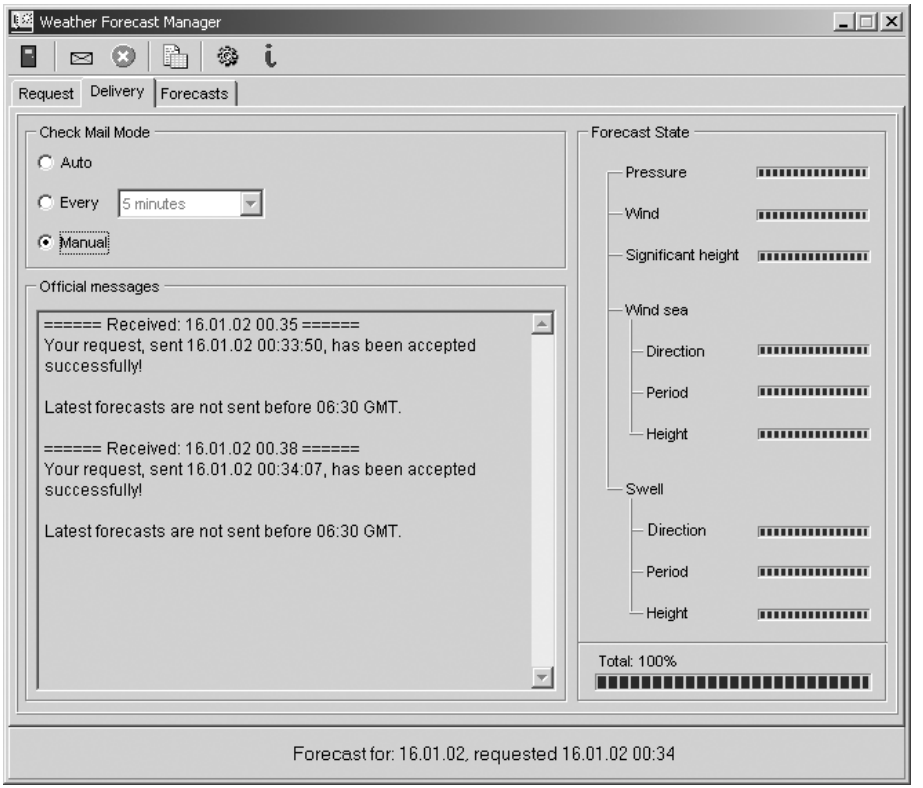
Note: data on the server is updated from 04.30 to 06.30 UTC every morning, so at this time weather forecasts are not sent to the users.

Receive the weather forecast by using your mail program.

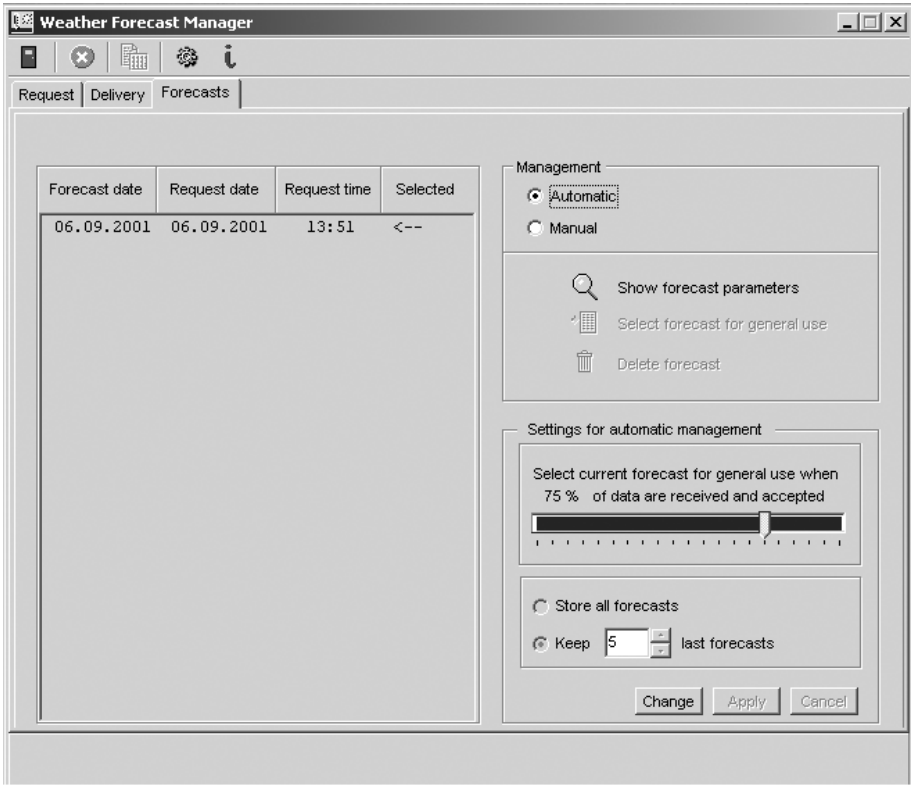
To receive a weather forecast in the WFM, open “Delivery” page.



In Check Mail Mode group, check Manual checkbox. Press  button in the main menu panel. The received weather forecast will be passed you're your mail program Inbox to the WFM. After the reception of the weather forecast, the WFM will automatically start its processing for the further use in the TN.



Open “Forecasts” page and check that it is the latest weather forecast you have received which is selected for use. An arrow in Selected column indicates the forecast currently used in the TN.



Select any received weather forecast as required. To do this, check Manual checkbox in Management group and press  button.

At this stage, reception and processing of the weather forecast are completed, and the received forecast can be used in the TN. To view the received weather forecast in the TN, use Animate button of Environment Data display.

ATTENTION!

Weather Forecast Manager utility can operate concurrently with Tsunamis Navigator. With the TN running, press <Ctrl> and <Esc> keys simultaneously to display the Start menu, then run WFM utility.

TN Hot Keys

Standard computer keyboard	Brief statement of purpose
<F4>	To make an instantaneous position record in the ship electronic log (Event)
<F8>	To turn on Navigation Mode (Ahead)
<Shift>+<F7>	To display chart objects belonging to the standard display (Standard display)
<Shift>+<F8>	To turn on the display of all the chart object classes (All information)
<Ctrl>+<PrtScrn> <PrtScr>	To make a graphic copy of the TN screen Only for the Win98
<Ctrl>+<A>	To acknowledge an alarm
<Alt>+<F1> <Alt>+<F2> <Alt>+<F3> <Alt>+<F4> <Alt>+<F5> <Alt>+<F6>	To switch screen palette successively to suit the time of the day: <Alt>+<F6> – under OS WinNT and Win2000 only
<+>	To increase the chart display scale
<->	To reduce the chart display scale

Alarm Messages and Recommended Procedures

Alarms are generated in case of the sensor failure, change of the mode or when the ship exceeds the set limitations (safety parameters). Alarm messages are displayed in the order corresponding to their generation time.

To turn off the acoustic alarm and alarm indication on the TN control panel at the time of the alarm generation, acknowledge it by clicking the mouse on the alarm indicator on the TN control panel. As this is done, the alarm message disappears from the panel line, whilst the Alarms panel indicator at the appropriate message is displayed in the red colour as long as the given limitation is exceeded, or until the function is deliberately disabled. If an alarm signal is associated with ship motion parameter limitation, this parameter is shown in the red colour in the relevant control panel window.

The following alarm messages appear in the process of the TN operation:

Alarm message	Meaning	Recommended procedure
Ag. monitoring off	with a change of a chart set under the ship position, there is no vector chart on a scale larger than that set in Check Scale Less function, which means the loss of control over the safety of navigation	Set the scale value in Check Scale Less function to suit the available folio
Anchor watch	The ship is beyond the set anchorage area	Check the ship position
ARPA: no input	The TN receives no data from the ARPA	Check the operation and connection of the navigation sensor
Chart datum unknown	Coordinate system of the chart under the ship symbol is unknown (datum of the original paper chart is not known) and coordinate offsets have zero value	Load another chart
Check Pos-HDG-LOG	At the TN start, DR positioning mode is set	Check the ship position and motion parameters
CPA/TCPA	CPA and TCPA are smaller than the set values	Be careful about the dangerous target
Diff. mode lost	Loss of differential positioning mode for a period of time larger than the set value	Check the ship position
Gyrocompass: no input	The TN receives no data from the compass	Check the operation and connection of the navigation sensor
Invalid heading data	The TN receives incorrect data from the compass	Check the compass operation
Invalid log data	The TN receives incorrect data from the log	Check the log operation
Last WP passed	The ship has passed the last WP of the passage loaded in the ‘Voyage Monitoring Mode”	Unload the passed route
LOG: no input	The TN receives no data from the log	Check the operation and connection of the navigation sensor
Nav. danger	The ship is approaching the isolated danger	Take note of the isolated danger
Off chart	The ship has sailed beyond the chart boundary with the chart autoload mode OFF	Load a chart under the ship position
Off course	Deviation from the plotted route	Check that the course set on the autopilot is correct
Out of the schedule	The ship is out of the route schedule	Check the ship position and motion parameters

Alarm message	Meaning	Recommended procedure
Out of XTE	Cross track error value exceeded	Check that the course set on the autopilot is correct
Prim. not WGS 84	Reception of coordinates which do not comply with WGS-84 coordinates	Set WGS-84 datum in the sensor. Determine the ship position by some other method, switch to DR mode if required
Primary sensor: no input	The TN receives no data from the positioning system	Check the operation and connection of the navigation sensor
PRIMARY Un-reliable. position	Unreliable ship positioning	Establish the cause of the poor quality positioning
Safety contour	The ship is crossing a safety contour	Check the ship position and motion parameters
Safety contour changed	With a change of the chart set under the ship position, the previously selected safety contour becomes unavailable	Set a new safety contour value
Sounder Depth	Reception of the current depth of less than the set value from the sounder	Be careful about the echo sounder readings
Sounder: no input	The TN receives no data from the echo sounder	Check the operation and connection of the navigation sensor
Temperature sensor: no input	The TN receives no data from the water temperature sensor	Check the operation and connection of the navigation sensor
Time sensor: no input	The TN receives no data from the time sensor	Check the operation and connection of the navigation sensor
Time zone changed	Change of the ship time	Check that the ship time has been changes correctly
Timer went off	Time set on the timer has expired	Acknowledge the alarm mes-sage by pressing on ALARM function
Unreliable wind data	The TN receives incorrect data from the wind sensor	Check the wind sensor operation
Wind sensor: no input	The TN receives no data from the wind sensor	Check the operation and connection of the navigation sensor
WP approach	The ship has approached a WP	Acknowledge the alarm mes-sage by pressing on ALARM function
Yeoman failure	The TN receives no data from the digitiser	Check the operation and connection of the navigation sensor

Alarm Messages about the Approach to Special Areas

The TN implements alarms generated when the ship symbol approaches areas and limiting lines digitised on a vector electronic chart. As an alarm is generated, the name of the area which the received alarm message is concerned with, will be displayed in the appropriate control panel window.

The list of the areas (Basic areas) tracked in accordance with IEC-61174 standard is provided below:

Message	Meaning
Anchor. Prohibited	Anchorage Prohibited
Anchorage area	Anchorage Area
Cable area	Cable Area
Fishing prohibited	Fishing Prohibited
Inshore traffic zone	Inshore Traffic Zone
Military area	Military Practice Area
Pipeline area	Pipeline Area
Recomm. traffic lane	Recommended Traffic Lane
Restricted area	Restricted Area
Traff. separ. zone	Traffic Separation Zone

Additional areas which alarms are generated for:

Message	Meaning
Danger line	Danger Line
Exl. econ. Zone	Limit of Exclusive Economic Zone
Explosive dumping	Explosives Dumping Ground
Fishery zone	Fishery Zone
Harbour limit	Harbour Limit
Int.mar.boundary	International Maritime Boundary
Nature Reserve	Limit of Nature Reserve
Prohibited area	Prohibited Area
Swept area	Swept Area
Territor. sea base	Straight Territorial Sea Base Line
Territorial sea	Territorial Sea
Unsurveyed area	Unsurveyed Area

ANNEX A. NMEA TELEGRAMS

The TN navigation system processes and transmits the following NMEA – 0183 and IEC 61162-1 standard telegrams.

The following telegrams are received from the navigation sensors.

Positioning System

- GGA – time, ship coordinates, HDOP, number of satellites used for positioning, operating mode of the satellite navigation system sensor, age of differential corrections, differential station identifier;
- RMC – date, time, ship coordinates, COG, SOG, operating mode of the satellite navigation system sensor;
- GLL – time, ship coordinates;
- VTG – COG, SOG;
- DTM – information on the datum set in the PS;
- GSV – numbers, azimuths, altitude, SNR values for all the navigation system satellites within the visibility range.

Time Sensor

- ZDA – date, time, time zone;
- ZLZ – time;
- ZZU – time.

Echo Sounder

- DBT – depth under the keel;
- DPT – depth under the keel;
- DBK – depth under the keel;
- DBS – depth under the keel.

Wind Sensor

- MWV – direction and speed of the relative or true wind;
- VWR – relative wind direction and speed;
- VWT – true wind direction and speed.

Water Temperature

- MTW – sea water temperature.
- LOG sensor:
- VHW – log speed through the water;
- VBW – log speed over the ground;
- OSD – log speed through the water;

Gyro/Magnetic Compass Sensor

- HDM – magnetic course;
- HDT – true course;
- VHW – true or magnetic course;
- OSD – true course.

ARPA:

- TTM – information on ARPA tracked targets;
- OSD – relaying of course and speed from the ARPA.

Yeoman Digitizer

- WPL – reception of latitude and longitude coordinates from the digitiser;
- GLL – reception of latitude and longitude coordinates by the digitiser from the TN;
- Telegrams for the transmission of information onto the external navigation sensors.

WP out Port

- WPL – WP geographic coordinates and identifier (information on all the WP's of the selected route is transmitted by using Upload Route functionality);
- RTE – identifier of all the WP's (information on all the WP's of the selected route is transmitted by using Upload Route functionality).

Output/Autopilot

- APA – XTE value and the direction to reduce it, route leg direction value from the previous WP to the next WP; identifier of the next WP;
- APB – XTE value and the direction to reduce it, route leg direction value from the previous WP to the next WP; identifier of the next WP, BTW value;
- BOD – route leg direction value from the previous WP to the next WP; identifiers of the previous and next WP;
- BWC -geographic coordinates and identifier of the next WP, BTW and DTW values, time;
- XTE – XTE value and the direction to reduce it;
- XTD – XTE value and the direction to reduce it;
- PRAPA XTE value and the direction to reduce it, route leg direction value from the previous WP to the next WP; identifier of the next WP;
- PASTE – XTE value and the direction to reduce it;
- WPL – geographic coordinates and WP identifiers (information on the previous WP and 13 following WP's is transmitted);
- RTE – WP identifiers (information on the previous WP and 13 following WP's is transmitted);
- R00 – WP identifiers (information on the previous WP and 13 following WP's is transmitted);
- VHW – ship compass course (magnetic and true), log speed through the water.

Output ARPA/Radar

- GLL – ship time and coordinates;
- VHW – ship compass course (magnetic and true), log speed through the water.
- ZDA – ship date and time, time zone number set in the TN;
- VTG – ship course (COG) and speed (SOG) over the ground;
- VDR – drift speed and direction values;
- WPL – geographic coordinates and identifiers of WP's (information on the previous WP and 13 following WP's is transmitted);
- R00 – WP identifiers (information on the previous WP and 13 following WP's is transmitted);
- RTE – WP identifiers (information on the previous WP and 13 following WP's is transmitted).

IEC 61162-1, 1995 standard telegrams:

APB, BWC, GLL (to Output only),VTG (to Output only), XTE.

IEC 61162-1, 2000 standard telegrams:

BOD, DBT, DPT, DTM, GGA, GLL, GSV, HDT, MTW, MWV, OSD, RMC, RTE, TTM, VBW, VDR, VHW, VTG, WPL, ZDA.

NMEA 0183 v.2.1 (1995) standard telegrams:

APA, DBK, DBS, HDM, R00, VWR, VWT, ZLZ, ZZU.

Messages in the Anschuts autopilot own standard:

PRAPA, PASTE.

Messages of an unknown standard:

XTD.

ATTENTION!

It should be noted that with the TN using magnetic directions, it is true values of bearing and route leg direction which are transmitted in messages to the autopilot. Passed in the VHW telegram is the ownship course value (HDG) both, in the magnetic and true directions, the magnetic variation used in the TN taken into account.