NAVI SAILOR VERSION 3.0.1

USER MANUAL

Installation checklist

1. Install the hardware and make all the connections (Technical Reference 2.1).
2. Install the software (Technical Reference 2.2/2. 3).
3. Check AUTOEXEC.BAT and CONFIG.SYS files (Technical Reference 2.2).
4. Perform initial settings and run the NS (Technical Reference 3.1)
5. Run REGISTRY utility for the copy registration (Technical Reference 6.1).
6. Fill in Hardware Setup and Sensor Connection tables (Technical Reference 6.2).
7. Put down the installation information on the first page of the User Manual (User ID information).
8. Give general instructions on the handling of the system to the crew

1 INTRODUCTION

1.1 General Notes and Warnings

1.1.1 Copyright

1.1.2 Warnings for the Use of Transas Charts

Electronic charts manufactured by TRANSAS (TRANSAS format charts) are not intended to substitute official nautical charts. TRANSAS charts do not necessarily include the latest corrections and must not be used otherwise than in combination with official paper charts.

It is a fully corrected paper chart, which is the primary source of navigational information for the user. All the vessel control decisions must be fully based on this chart's data.

The vessel's position displayed on the screen is only a graphic presentation of the coordinates, their accuracy depending on the position sensor connected.

Before planning the route using the NS video-plotter facilities, it is first necessary to do it on the suitable scale paper charts, updated from the latest Notices.

When transferring any data from a paper chart to the NS, pay special attention to the possible difference between the paper chart datum and WGS-84 datum used for the manufacture of TRANSAS charts

1.2 How to Use this Manual

1.2.1 General Review and Purpose of the User Manual

This User Manual (hereinafter referred to as "Manual") deals with issues connected with various aspects of using the NaviSailor software (hereinafter referred to as the NS) in the process of its operation.

The Manual is so arranged that the user can promptly obtain information on the procedures required for the solution of the problem he/she is faced with, using the NS facilities.

The Manual consists of three parts:

1) "Introduction" containing some general notes and principles of using this Manual.
2) "Purpose and General Description of NaviSailor Series Video-plotter". This part describes the capabilities and main operating modes, as well as the information display principles and the NS controls.
3) "User Work with the NaviSailor Software". This is the principal part of the Manual, which contains the list of tasks, which can be performed using the NS, and the procedures involved. To be able to use this part of the Manual, the beginner should necessarily familiarize him/herself with information provided in paragraph 'Data Required for the Work with the Manual' (see below).
4) "Annex" to the Manual.

1.2.2 Data Required for the Work with the Manual

Information set forth in Part 3 of the Manual is presented in the form of tables with the types of problems solved by the NS for headings Possible options of their solutions are listed as follows:

- in numbered paragraphs of the section;
- with "•" symbol, when the alternative solutions are provided for the given stage of the problem.

Keys and buttons used in the Manual for the descriptions of procedures:

- a key stroke on the keyboard is denoted by the key name in angle brackets, e. g., <+ > means pressing "+" key;
- <Alt>+ <F2> notation means that you should hold down the <Alt> key as you press <F2> key;
- <Esc> notation means that you should press this key on the keyboard or the right trackerball/mouse button. This key is used for canceling input of a typed value, or for exiting into the NS main menu.

References to other paragraphs of the Manual and Notes:

- names of paragraphs listed in the 'Alphabetic List' are marked with apostrophes and/or a capital letter in the tables;
- data input or parameter selection windows appearing in the Menu Area, as well as various information windows and work with them are described in paragraph "Menu Area";
- warnings and notes, which the reference is provided to in the table, are given at the end of these tables.

An example of performing the prescribed procedures for the solution of problems in the NS is given below:

3. 4. 6. (number of the paragraph from the list) **Viewing Other Charts and Navigation Areas** (name of the paragraph - type of the problem to be solved)

The NS main menu function involved and/or actions required to be taken	Indicator position and/or the menu executive key (on the keyboard)	NS display of the actions performed and/or notes
1	**2**	**3**
CHART\Chart autoload	ON	To turn on the 'Chart Autoloading' mode
REVIEW	<Enter>	A 'Graphics Cursor' appears
Position the cursor on the required chart fragment	<Enter>	The current chart is redrawn around the point with the cursor's coordinates (centering)

	<Esc>	To exit from the viewing mode to the NS main menu (see Menu Area')

The following procedure should be used for performing this task:

- use the 'Trackerball' or 'Keyboard' to position the cursor on *CHART NS* main menu option and press the left trackerball button or <Enter> key;
- in the submenu which will appear position the cursor on *Chart autoload* line and press <Enter> again: the function's indicator is activated (turns orange);
- move the 'Trackerball' up and down or use the cursor control keys on the 'Keyboard' to set the required indicator position (ON) and press <Enter> again to turn on the chart automatic loading mode. For more detailed information on this note see the paragraph with this name (for which purpose you should look up the name of the paragraph in the 'Alphabetic List');
- press <Esc> to exit into the NS main menu, position the cursor on *REVIEW* function and press <Enter>: a Graphics Cursor appears (for the description of work with the Graphics Cursor see the paragraph with this name Graphics Cursor);
- use the trackerball to position the cursor on the chart fragment, which is required to be reviewed and press <Enter> to center the current chart in the cursor's new position;
- after completing the viewing, press <Esc> on the keyboard or the right trackerball button to exit from this operation mode into the NS main menu (for the description of the main menu see Menu Area paragraph).
- In the above sample, in addition to what has been said, it is necessary to note the following specific features of the data input and notations which you may come across in following the procedures specified in such tables:
- to set the required values (or those specified in column 2 of the table) in the functions' literal indicators follow the procedure similar to that considered in a sample of ON/OFF type indicator;
- to set the required values in a function's digital indicator, it is necessary to activate this indicator, then use trackerball (or the keyboard) to enter this value, then press <Enter> to confirm the input;

- enter the coordinates (or dates) group by group. This means that after entering each group of data (degrees, minutes, hemisphere) it is necessary to press <Enter>. To cancel the input of a value at any stage of its entry press <Esc> on the keyboard or press the right trackerball button;
- if different functions can be used for performing an action, other possible options (functions) are shown in parenthesis, e.g., *SHIP\Primary (Secondary)* pos. notation means that at the user's option primary or secondary vessel positioning can be selected.

1.2.3 Abbreviations Used in the Manual

App.	Appendix;
COG	Course Over Ground;
ECDIS	Electronic Chart Display and Information System;
ENC	Electronic Navigational Chart;
ERBL	Electronic Range and Bearing Line;
ERML	Expected Relative Motion Line;
ETA	Estimated Time of Arrival;
ETML	Expected True Motion Line;
GMT	Greenwich Mean Time;
GPS	Global Positioning System;
HO	Hydrographic Office;
NS	NaviSailor;
OS	Operating System;
RAM	Random Access Memory;
RML	Relative Motion Line;
SENC	System Electronic Navigational Chart;
STG	Speed To Go;
TML	True Motion Line;
XTE	Cross Track Error.

2 PURPOSE AND GENERAL DESCRIPTION OF NAVISAILOR SERIES VIDEO-PLOTTER

2.1 NS Purpose and Principal Operation Modes

2.1.1 NS Purpose and Capabilities

NaviSailor series video-plotter is an electronic information and chart system used with the aim of ensuring safe navigation.

The following functional capabilities are implemented in this software:

- display of electronic vector and raster charts of different formats (up to 6 charts simultaneously);
- data exchange with navigational sensors and external output devices enabling the vessel position coordinates to be continuously obtained and vessel controlled in accordance with changing navigational situation;
- route planning and drawing up the schedule of proceeding along this route;
- monitoring of approach to the dangers to navigation plotted on an electronic vector chart or on a user chart created by the navigator;
- trial maneuver for avoiding collision with other vessels displayed on the NS screen in accordance with the information received from the ARPA;
- solution of various kinds of navigational problems;
- other capabilities described in this "User Manual".

2.1.2 Voyage Monitoring Mode

The Voyage Monitoring mode is a compulsory permanent mode, which is run concurrently with other operation modes and ensures the following:

- continuous vessel tracking;
- automatic recording of the ownship's primary (principal) and secondary (auxiliary or reference) tracks;
- recording of ARPA targets' tracks;
- keeping of the electronic ship's log;

- obtaining information on the status of connected units;
- graphically expressed summary assessment of the accuracy of vessel positioning and plotting of objects on the chart;
- obtaining data on the vessel's position relative to the route;
- obtaining calculated vector of current in the vessel's position and summary drift vector between COG/SOG - HDG/LOG;
- display of the current electronic chart scale;
- obtaining data from the auxiliary navigational sensors (depth, drift speed and direction, weather condition parameters).

In addition, this mode ensures permanent monitoring of the vessel's position relative to the objects listed below. In case of a dangerous approach to one of such objects the NS gives off an appropriate alarm (see Setting the Parameters for Monitoring Safety at Sea and Setting the Alarms in Voyage Monitoring Mode):

- safety contours;
- isolated dangers (see below) with depths less than the set one;
- special areas, available in the chart and/or updating database and located within a certain range from the vessel (up to 10 miles).

The following vector chart objects are automatically assessed by the NS as isolated dangers:

- explosives;
- fish haven;
- foul ground;
- distinctive depth, submerged obstruction;
- obstruction, which covers and uncovers;
- oil/gas production platform;
- rock;
- shoal;
- well;
- shipwreck;
- shipwreck showing any portion of hull at the level of chart datum.

2.1.3 Navigation Mode

Navigation Mode is the principal mode of the NS operation, implies a constant display of the ownship's position on the screen and is running concurrently with the Voyage Monitoring Mode'.

In this mode the NS provides the navigator with the following data:

- ownship's position (vessel's symbols and motion vector) and ownship's tracks (from the primary and secondary positioning);
- electronic chart with layers of automatic and manual correction, and special user information;
- secondary radar information (ARPA tracked targets) in the graphic form with the relevant entries in the table;
- targets acquired by the GPS-transponder system;
- results of the ownship trial maneuver (with course and/or speed) in the graphic form taking into account the vessel's dynamic characteristics and summary drift, estimated position of the own ship and targets for any moment of time (up to 24 minutes), parameters of dangerous approach to the targets;
- route planning on the chart;
- display of sector lights in the color visible from the vessels' position with the light visibility range taken into account (if the light cannot be seen the lighthouse is shown in the gray color).

It should be noted that when some of the NS functions are activated, the Navigation Mode is automatically exited from. To turn on or return to the Navigation Mode use either of the following:

- select AHEAD (in the NS main menu);
- press <Insert> or <F8> (on the keyboard).

2.2 NS Screen

The NS screen includes three areas (see Fig. 2–1). The left hand part is the Electronic Chart Area. Information Area and Menu Area take up the right hand part. Sometimes when it is necessary to display some additional information command, e. g., route plan waypoints, ship's log entries, HELP text, etc. (as required by operator), a window opens up in the left bottom part of the screen.

At this time the chart is displayed in the top part of the screen.

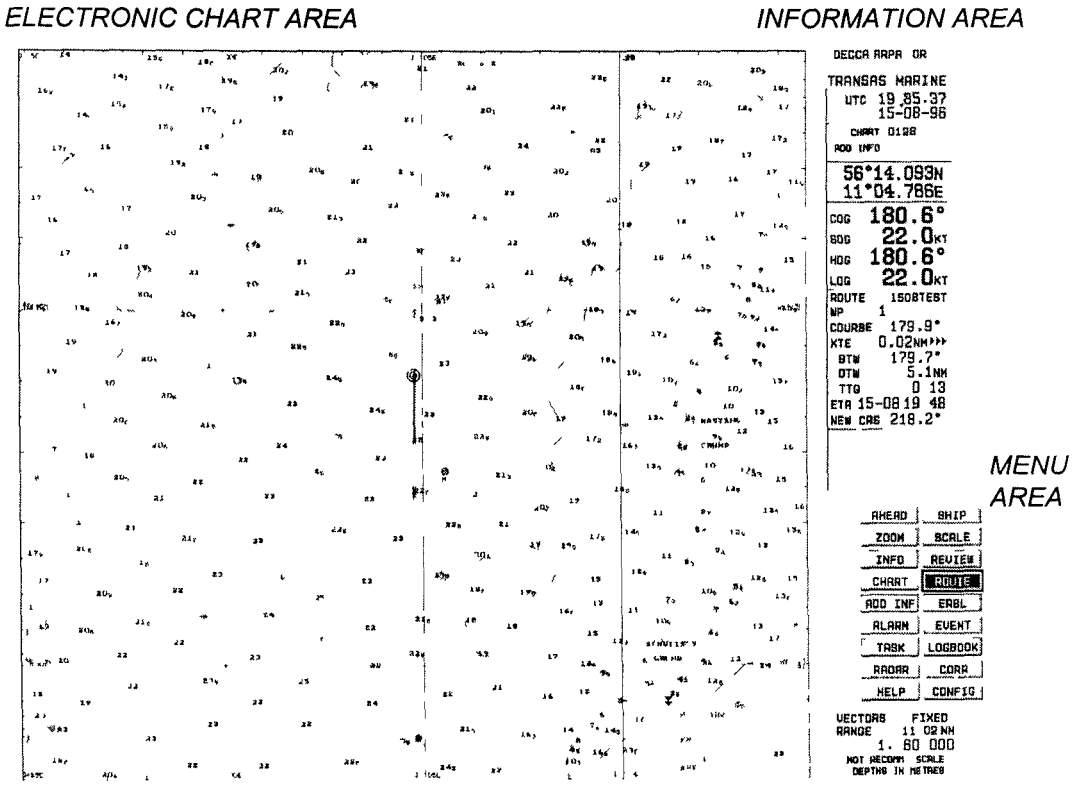


Fig. 2–1 ***Screen Areas of Navi Sailor***

2.2.1 Electronic Chart Area

This area may display the following information:

- electronic charts (up to 6) covering the screen;
- outlines and ID numbers of all the charts available in the collection (for the displayed charts the frames are shown in a bold line and numbers are in the bold type);
- numbered reference grid;
- additional information (such as temporary updating);

- route plan with numbered waypoints;
- ownship symbol - its primary position with a speed vector and the secondary position;
- display of the vessel's primary and secondary tracks;
- ARPA cursor and ERBL;
- positions and motion vectors of targets acquired by ARPA;
- positions and motion vectors of targets acquired by the GPS transponder system;
- results of the trial maneuver;
- current vectors.

The bottom right corner of the electronic chart displays an angle shaped indicator, the sides of an angle formed by a thin line and a bold line.

Bold line is a graphic presentation of the maximum possible error of plotting objects on TRANSAS chart. When a chart is displayed on the scale of the original, the linear size of the error is taken to be 2 mm. As the scale is growing, the linear dimensions of the indicator increase showing to which extent the chart information can be relied on.

Thin line is a graphic presentation of a possible error of the vessel's position sensor, which is taken to be equal to 70 m.

In the absence of charts suitable for loading, or with 'Chart Autoload' OFF, No Data Area may appear on the NS screen: a gray colored field with no information whatsoever. Such area will be automatically covered with a chart during the screen regeneration if 'Chart Autoload' is turned ON.

2.2.2 NS Information Area

The data displayed continuously in the Information area includes the following:

- indicator of the positioning methods (primary on the left and secondary on the right). The following designations are possible:

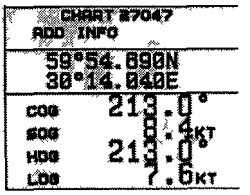
GPS - GPS*;
DECCA -DECCA;
LRNN -LORAN-C*;
OMGA - OMEGA*;

ER - positioning by ARPA reference target;
DR - dead reckoning;
NONE - secondary positioning is switched off

> ☞ *Note: positioning methods marked with* (asterisk) may have a differential mode (DGPS, DLRNC, DOMGA);*

- indication that ARPA is connected;
- status of the workstation operating in the network (displayed in the absence of alarm messages);
- TRANSAS MARINE trademark (displayed in the absence of "POSITION DROPPED" indicator meaning that the vessel symbol is not shown on the chart);
- current time and date:
  UTC - Greenwich time and date,
  LOCAL - ship's time and date;

- displayed electronic chart number;
- number or name of the user charts loaded in areas A and B;
- vessel position coordinates and an offset indicator (if the offset is taken into account). The indicator is an orange colored triangle displayed to the left of coordinates which shows that the position coordinates received from the currently used positioning system for the primary vessel position, are corrected with the offset;

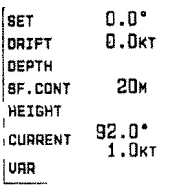


- vessel's course and speed obtained from the positioning system (or entered manually),
- gyro readings;
- log readings.

There are 4 types of display in the NS Information Area.

1. Display System Mode presents general data on the sailing conditions

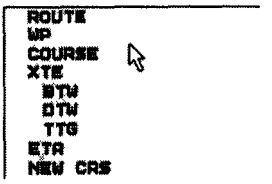
- set (direction the vessel is drifting in);
- drift (speed the vessel is drifting at);
- depth from the sounder;
- calculated safety contour;
- calculated tidal rise in the closest reference point as of the current time;



- calculated direction and speed of current in the vessel's position as of the current time;
- range and bearing to an acquired fixed object.

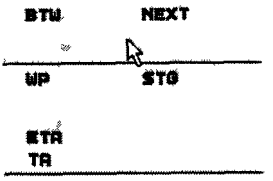
2 Display Route Mode presents data on the planned route

- route name;
- name and number of the next WP,
- vessel's course;
- cross track error with the indication of direction;
- bearing and range to the next waypoint;
- time to go to the next waypoint;
- estimated date and time of arrival in the next waypoint;
- course to steer to the next waypoint.



3 Display Pilot Mode presents data on the vessel's position relative to the current waypoint, calculated motion speed and ETA in the next waypoint:

- bearing to the current WP,
- course to the next WP; number of the WP for which ETA is set in the loaded schedule;
- calculated speed to go for arrival in the WP for which ETA is set in the loaded voyage schedule. With this type of display, the following indications may appear with this parameter:



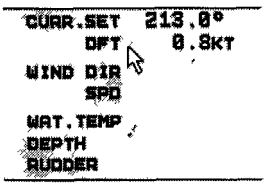
STG without any marks (asterisk) corresponds to the option when the ETA is set in the voyage schedule, whilst the speeds on the route segments are calculated;
STG with an asterisk on the left means that the speed has been preset on one or several route segments;
an asterisk on the right indicates that the speed has been preset in the voyage schedule for the current route segment, whilst the displayed STG parameter value shows the speed to go;

- ETA in the set WP with the current speed (SOG) remaining unchanged,
- time of arrival in the set WP according to the voyage schedule

4 Display Weather Mode presents data on the weather conditions

- set (direction the vessel is drifting in);
- drift (speed the vessel is drifting at);

- wind direction (with the side - L or R- indicated for the relative wind and 360 degree measurement for the true wind);
- wind speed,
- outside water temperature;
- depth from the sounder;
- indicator of the rudder blade position.



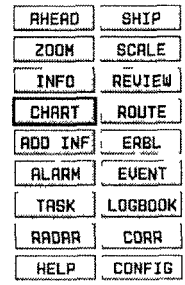
The middle part of the NS Information Area is intended for displaying the results of limit speed calculations from the parameters set by the navigator regardless of the data in the loaded voyage schedule (see 'Limit Speed Calculations for Proceeding Along the Route'). The same part of the Area contains information on the changes of range and bearing to an objects tracked via *TASK\OBJECT* function (see Auxiliary NS Facilities Used in the Voyage Monitoring Mode, paragraph 4)

The lower part of the Information Area displays:

- length of speed vectors and the range in nautical miles across the electronic chart display;
- selected scale of the chart display;
- and the following warnings:
  - NOT RECOMM. SCALE or DANGEROUS SCALE if the scale of the chart display on NS screen is up to 5 or over 5 fixed points (respectively) larger than that of the paper original;
  - LAYERS LOST if not all the Standard display information layers are shown (see Turning ON/Off the Display of Various Information Layers),
  - LOOK UP BETTER CHART if there is a larger scale chart available for the vessel position than that in use.

2.2.3 Menu Area

The NS Menu Area displays the names of functions available for use at the moment. When the NS is switched on, this area displays multilevel MAIN MENU. Menu functions, which contain submenus, rather than perform any specific actions, are called options. The main menu has a structure shown in Fig. 2-2.



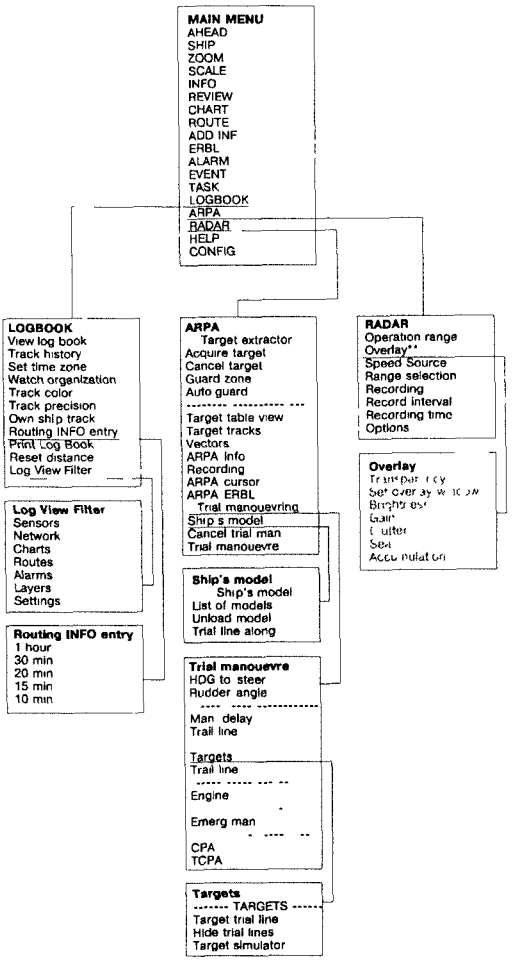

MAIN MENU
AHEAD
SHIP
ZOOM
SCALE
INFO
REVIEW
CHART
ROUTE
ADD INF
ERBL
ALARM
EVENT
TASK
LOGBOOK
ARPA
RADAR
HELP
CONFIG
LOGBOOK
View log book
Track history
Set time zone
Watch organization
Track color
Track precision
Own ship track
Routing INFO entry
Print Log Book
Reset distance
Log View Filter
Log View Filter
Sensors
Network
Charts
Routes
Alarms
Layers
Settings
Routing INFO entry
1 hour
30 min
20 min
15 min
10 min
ARPA
Target extractor
Acquire target
Cancel target
Guard zone
Auto guard
Target table view
Target tracks
Vectors
ARPA Info
Recording
ARPA cursor
ARPA ERBL
Trial manouevring
Ship s model
Cancel trial man
Trial manouevre
Ship's model
Ship's model
List of models
Unload model
Trial line along
Trial manouevre
HDG to steer
Rudder angle
Man delay
Trail line
Targets
Trail line
Engine
Emerg man
CPA
TCPA
Targets
TARGETS
Target trial line
Hide trial lines
Target simulator
RADAR
Operation range
Overlay**
Speed Source
Range selection
Recording
Record interval
Recording time
Options
Overlay

Fig. 2–2

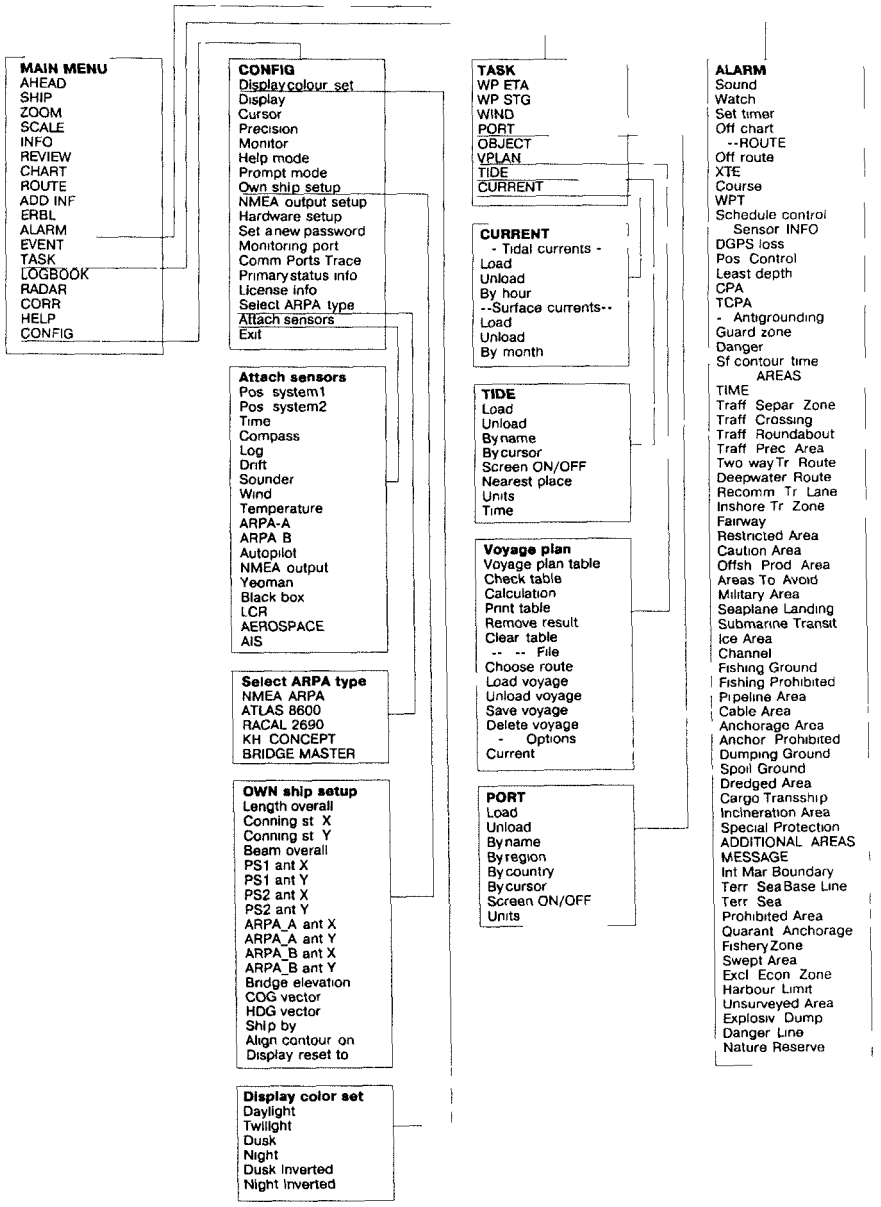
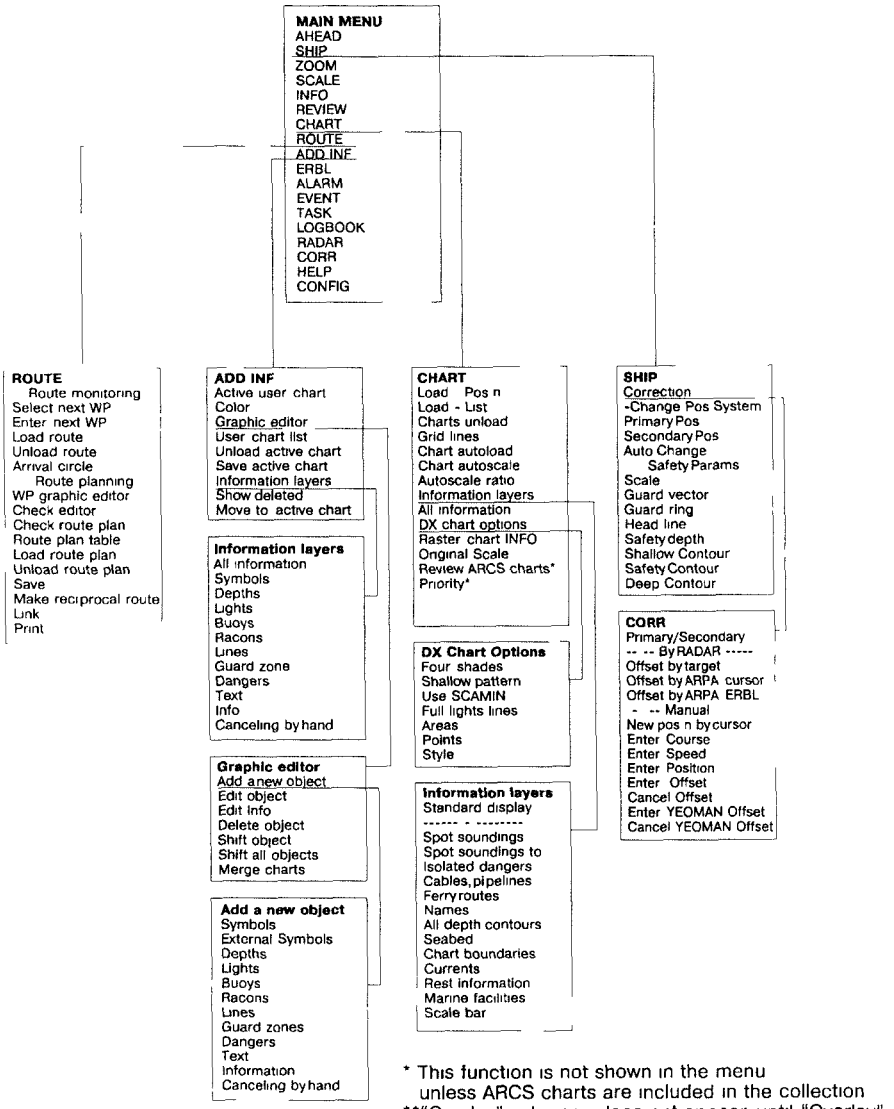

MAIN MENU
AHEAD
SHIP
ZOOM
SCALE
INFO
REVIEW
CHART
ROUTE
ADD INF
ERBL
ALARM
EVENT
TASK
LOGBOOK
RADAR
CORR
HELP
CONFIG
CONFIG
Display colour set
Display
Cursor
Precision
Monitor
Help mode
Prompt mode
Own ship setup
NMEA output setup
Hardware setup
Set a new password
Monitoring port
Comm Ports Trace
Primary status info
License info
Select ARPA type
Attach sensors
Exit
Attach sensors
Pos system1
Pos system2
Time
Compass
Log
Drift
Sounder
Wind
Temperature
ARPA-A
ARPA B
Autopilot
NMEA output
Yeoman
Black box
LCR
AEROSPACE
AIS
Select ARPA type
NMEA ARPA
ATLAS 8600
RACAL 2690
KH CONCEPT
BRIDGE MASTER
OWN ship setup
Length overall
Conning st X
Conning st Y
Beam overall
PS1 ant X
PS1 ant Y
PS2 ant X
PS2 ant Y
ARPA_A ant X
ARPA_A ant Y
ARPA_B ant X
ARPA_B ant Y
Bridge elevation
COG vector
HDG vector
Ship by
Align contour on
Display reset to
Display color set
Daylight
Twilight
Dusk
Night
Dusk Inverted
Night Inverted
TASK
WP ETA
WP STG
WIND
PORT
OBJECT
VPLAN
TIDE
CURRENT
CURRENT
- Tidal currents -
Load
Unload
By hour
--Surface currents--
Load
Unload
By month
TIDE
Load
Unload
By name
By cursor
Screen ON/OFF
Nearest place
Units
Time
Voyage plan
Voyage plan table
Check table
Calculation
Print table
Remove result
Clear table
-- -- File
Choose route
Load voyage
Unload voyage
Save voyage
Delete voyage
- Options
Current
PORT
Load
Unload
By name
By region
By country
By cursor
Screen ON/OFF
Units
ALARM
Sound
Watch
Set timer
Off chart
--ROUTE
Off route
XTE
Course
WPT
Schedule control
Sensor INFO
DGPS loss
Pos Control
Least depth
CPA
TCPA
- Antigrounding
Guard zone
Danger
Sf contour time
AREAS
TIME
Traff Separ Zone
Traff Crossing
Traff Roundabout
Traff Prec Area
Two way Tr Route
Deepwater Route
Recomm Tr Lane
Inshore Tr Zone
Fairway
Restricted Area
Caution Area
Offsh Prod Area
Areas To Avoid
Military Area
Seaplane Landing
Submarine Transit
Ice Area
Channel
Fishing Ground
Fishing Prohibited
Pipeline Area
Cable Area
Anchorage Area
Anchor Prohibited
Dumping Ground
Spoil Ground
Dredged Area
Cargo Transship
Incineration Area
Special Protection
ADDITIONAL AREAS
MESSAGE
Int Mar Boundary
Terr Sea Base Line
Terr Sea
Prohibited Area
Quarant Anchorage
Fishery Zone
Swept Area
Excl Econ Zone
Harbour Limit
Unsurveyed Area
Explosiv Dump
Danger Line
Nature Reserve

Fig. 2–3


MAIN MENU
AHEAD
SHIP
ZOOM
SCALE
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REVIEW
CHART
ROUTE
ADD INF
ERBL
ALARM
EVENT
TASK
LOGBOOK
RADAR
CORR
HELP
CONFIG
ROUTE
Route monitoring
Select next WP
Enter next WP
Load route
Unload route
Arrival circle
Route planning
WP graphic editor
Check editor
Check route plan
Route plan table
Load route plan
Unload route plan
Save
Make reciprocal route
Link
Print
ADD INF
Active user chart
Color
Graphic editor
User chart list
Unload active chart
Save active chart
Information layers
Show deleted
Move to active chart
Information layers
All information
Symbols
Depths
Lights
Buoys
Racons
Lines
Guard zone
Dangers
Text
Info
Canceling by hand
Graphic editor
Add a new object
Edit object
Edit Info
Delete object
Shift object
Shift all objects
Merge charts
Add a new object
Symbols
External Symbols
Depths
Lights
Buoys
Racons
Lines
Guard zones
Dangers
Text
Information
Canceling by hand
CHART
Load Pos n
Load - List
Charts unload
Grid lines
Chart autoload
Chart autoscale
Autoscale ratio
Information layers
All information
DX chart options
Raster chart INFO
Original Scale
Review ARCS charts*
Priority*
DX Chart Options
Four shades
Shallow pattern
Use SCAMIN
Full lights lines
Areas
Points
Style
Information layers
Standard display
Spot soundings
Spot soundings to
Isolated dangers
Cables, pipelines
Ferry routes
Names
All depth contours
Seabed
Chart boundaries
Currents
Rest information
Marine facilities
Scale bar
SHIP
Correction
-Change Pos System
Primary Pos
Secondary Pos
Auto Change
Safety Params
Scale
Guard vector
Guard ring
Head line
Safety depth
Shallow Contour
Safety Contour
Deep Contour
CORR
Primary/Secondary
-- -- By RADAR -----
Offset by target
Offset by ARPA cursor
Offset by ARPA ERBL
- -- Manual
New pos n by cursor
Enter Course
Enter Speed
Enter Position
Enter Offset
Cancel Offset
Enter YEOMAN Offset
Cancel YEOMAN Offset
* This function is not shown in the menu
unless ARCS charts are included in the collection
**"Overlay" submenu does not appear until "Overlay"
function indicator is switched to ON or SPOT

Fig. 2–4

To move the cursor (a black colored box) among the menu items use the cursor control keys on the "Keyboard", <PgUp>, <PgDn>, <Home>, <End> keys, or move the "Trackerball" up and down. The required menu item is selected by pressing <Enter> key; to cancel the selection and return to a higher menu level press <Esc>.

The following information and dialogue windows can be displayed in the Menu Area during the NS operation:

Window type	Purpose	Means and procedures for work with data contained in a window
1	**2**	**3**
Data input window	To enter the required parameters, names, etc.	Enter the data group by group confirming each types value by pressing <Enter>
Dialogue "Yes/No" window	To confirm actions essential in regard of safety at sea	To confirm or cancel a particular action position the cursor on the answer in the dialogue box, which corresponds to the taken decision, press <Enter>
System password input window	To obtain access to the functions essential in regard of the vessel's navigational safety	Enter the password and press <Enter> (by default the following password is set: TRANSAS+ <space>)
Object selection window. Color palette, lists	To select the required objects by their names, their characteristics, color to be displayed in on the NS screen, etc.	To select position the cursor on the required object (name) and press <Enter>

2.3 Controls

2.3.1 Trackerball or Mouse

The only difference between the mouse and trackerball is the way the ball moves. These units may have 2 or 3 pushbutton switches. If your unit has 3 switches, the center button is not used.
LEFT BUTTON - corresponds to <Enter> key on the keyboard.

RIGHT BUTTON - corresponds to <Esc> key on the keyboard

By rolling the ball, you can control the cursor's position on the display, select menu options and alter values of various parameters.
When the trackerball is used to alter numbers (e. g. coordinates, course or speed) it is necessary to remember the following specific features

- forwards and backwards movement of the ball provides coarse adjustment of a parameter, i.e. it increments\decrements the number by the larger of displayed values (e. g., tens of degrees, etc.);
- a sideward movement of the ball to the left or right provides fine adjustment of a parameter, i.e. increments\decrements the number by the lower of the displayed values (e. g. degrees, knots).

2.3.2 Keyboard

The principal NS control is a mouse/trackerball. However, all the control capabilities are duplicated on the keyboard. <Enter> key serves for the input of parameters, activating menu and submenu functions and corresponds to the trackerball's left button. <Esc> key serves for exiting from a function when its use is cancelled, in case of an erroneous data input and corresponds to the trackerball's right button.
The cursor control keys correspond to the trackerball's movement and perform same functions.
To speed up or slow down the cursor's motion on the screen these keys are used in combination with <Alt> and <Ctrl> keys. This changes the cursor's step:

- <Alt>+ <→↓←↑> - to speed up the cursor motion;
- <Ctrl>+ <→↓←↑> - to slow down the cursor motion

The right-hand digital part of the keyboard can also be used for moving the cursor: <7>, <9>, <1>, <3> corner keys allow moving the cursor along the diagonals, <5> central key places the cursor in the center of the screen, <Ctrl>+ <5> combination puts the cursor on the vessel's symbol.
Parts of functions used more often than others, are connected with function keys and can be called up by pressing an appropriate key without referring to the menu. The function keys are positioned in the upper row of the keyboard, from <F1> to <F12>. Use <Shift>, <Alt> and <Ctrl> to extend this row. The list of function called up by these keys is provided in chapter 'Hot Keys'.

2.3.3 Hot Keys

KEYS	FUNCTION	BRIEF STATEMENT OF PURPOSE
<F1>		'Obtaining information on work with the NS"
<F2>	TASK	To call up the submenu of navigational task functions
<F3>	Load/Save	To load/unload and save charts and route in the Voyage Monitoring Mode, and user charts
<F4>	EVENT	To instantly record a position in the electronic ship's log
<F5>	REVIEW	To view and load charts
<F6>	SCALE	To scale charts
<F7>	ZOOM	To zoom chart fragments
<F8>	AHEAD	To turn on Navigation Mode
<F9>	ARPA\Trial maneuver	To turn on the trial maneuver mode (maneuver parameters input window)
<F10>	ROUTE\WP Editor	To turn on the graphic editor for creating and editing routes
<F11>	INFO	To obtain information on the chart and objects plotted on it
<F12>	ERBL	To turn on ERBL
<Shift>+ <F2>	TASK\WP STG	To display a data input window for STG (Speed to Go) calculations

<Shift>+ <F3>	CONFIG\Primary status info	To display a window with information on the quality of a position fix from the GPS data on the primary track
<Shift>+ <F4>	SHIP\Correction	To call up a submenu of functions for correcting the vessel's position
<Shift>+ <F5>		To center the vessel's position on the screen
<Shift>+ <F7>	CHART\Information layers\Standard display	To display chart objects belonging to the Standard Display
<Shift>+ <F8>	CHART\All information	To turn on the display of all chart object classes
<Shift>+ <F11>	ARPA\ARPA info	To turn on/off the display of radar information
<Shift>+ <F12>	CONFIG\Precision	To set the number of digits after the decimal point for the coordinates obtained from the positioning system
<Ctrl>+ <F2>	CHART	To call up the submenu of functions for work with charts
<Ctrl>+ <F3>	ROUTE	To call up the submenu of functions for work with routes
<Ctrl>+ <F4>	ADD INFO	To call up the submenu of functions for work with user charts
<Ctrl>+ <F5>	LOGBOOK	To call up the submenu of functions for work with electronic ship's log
<Ctrl>+ <F6>	LOGBOOK\Track Color	To select color for the primary track display
<Ctrl>+ <F8>	LOGBOOK\View log book	To view the ship's log entries
<Ctrl>+ <F9>	ARPA\Cancel trial man.	To turn off the trial maneuver mode
<Ctrl>+ <F10>	ROUTE\Route plan table	To display a table for the route data input
<Ctrl>+ <F11>	ARPA	To call up the submenu of functions for work with ARPA
<Ctrl>+ <F12>	CHART\Chart autoload	To fix the chart under the vessel position

		'Changing the order of overlaying the displayed charts':
<Ctrl>+ <0> <Ctrl>+ <L>		- by using the Graphics Cursor - from the list
<Ctrl>+ <R>		To turn on/off the display of ARPA screen (see Display of ARPA Cursor, ERBL and Screen)
<Ctrl>+ <PrtScrn>		To make a graphic copy of the NS screen (see Obtaining Additional Information During the NS Operation in the Voyage Monitoring Mode)
	CONFIG\Display color set\:	***To select the screen color palette to suit the time of the day:***
<Alt>+ <F1>	Daylight	- daytime
<Alt>+ <F2>	Twilight	- twilight
<Alt>+ <F3>	Dusk	- moonlit night (Information Area is against a white background)
<Alt>+ <F4>	Night	- moonless night (Information Area is against a white background)
<Alt>+ <F5>	Dusk Inverted	- moonlit night (Information Area is against a black background)
<Alt>+ <F6>	Night Inverted	- moonless night (Information Area is against a black background)
<Alt>+ <F8>	CHART\Information layers	To select chart objects for the display
<Alt>+ <F9>		To switch between targets' ETMLs and ERMLs during the 'Trial Maneuver for Avoiding collisions with Other Vessels'
<Alt>+ <F10>	ADDINF\Graphic editor	To call up the graphic editor for creating/ editing user charts
<Alt>+ <Esc>	ALARM	To acknowledge the alarm
<Alt>+ <R>		To have the screen regenerated
<Insert>		To attach the chart to the vessel's position (see Navigation Mode)
<Delete>		To detach the chart from the vessel's position
<Tab>	CONFIG\Display	To turn on one of the four display types in the NS Information Area

<+ >		To increase the chart display scale
<->		To reduce the chart display scale
<* >	CHART\Original scale	To set the original chart scale
<Alt>+ <End>		To set the mode of always displaying the cursor on the last entry in the tables of the ship's log and radar target parameters
<Alt>+ <M>		To display the data window during the 'Work with LEICA VECTOR 1500 DAE/DAES Binoculars'

Note: to obtain more detailed information on the purpose and use of functions listed above see "Technical description of NaviSailor series software".

2.3.4 Free Cursor

The NS allows using a cursor modification - FREE cursor that is moved by the Trackerball over the entire screen acquiring various shapes and functional capabilities in different display areas. To turn on this cursor modification use "System" utility (see "Utilities" document).

Free Cursor's functional capabilities listed below depend on its position on the NS screen (some of them are not duplicated by the keyboard).

1. In the Menu Area the free cursor takes a shape of a box marking off the NS main menu keys, similar to the operation of an ordinary cursor.
2. In the NS Information Area the free cursor has a shape of an arrow, which can be used for performing the following functions:

Functional capability	*Procedure required for implementing it*
To acknowledge an alarm	Position the free cursor on the second line of the Information Area (where alarm messages are displayed) and press the left trackerball button
To change the accuracy of coordinates obtained from the positioning system	Position the cursor in the section containing the current vessel position coordinates and press the left trackerball button

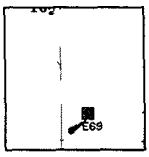
To select one of the four display modes in the Information Area	Position the cursor in the appropriate section and press the left trackerball button successively
To change scale	Position the cursor on the line with the current electronic chart scale, press the left trackerball button and select the required scale

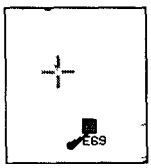
3. In the Chart Area the free cursor may have a shape of various tools switched by pressing the right trackerball button:

Free cursor's shape	Functional capabilities implemented by pressing the left trackerball button
View	To activate REVIEW function
View (when the cursor is positioned on a radar target)	To display a window with parameters of this radar target
Info	To activate INFO function
Zoom	To activate ZOOM function
ERBL	To activate ERBL function

2.3.5 Graphics Cursor

Graphics Cursor is used in the operation of some NS functions and has a shape of an intersection of lines corresponding to the latitude and longitude of the given point, the shape of the cursor, however, can be changed as required:





1	2	3
CONFIG\Cursor	LONG	The cursor is shown as an intersection of two lines corresponding to the latitude and longitude of the given point (see fig.)
	SHORT	The cursor is shown as a small cross (see fig.)

To move such cursor use the 'Trackerball' or the cursor control keys on the 'Keyboard'; or by entering manually coordinates of the point where the cursor is required to be positioned after the cursor activity has been switched to the information window. In addition, during the NS operation

with a connected digitizer, its execution button can be used for controlling the Graphics Cursor operation (see the appropriate chapter of "Technical Reference").

Information window, which appears in the Menu Area simultaneously with the Graphics Cursor, contains the following data:

- this window's name reflecting the NS facility which the Graphics Cursor is used within;
- cursor position coordinates;
- values of bearing/ reciprocal bearing and range to the cursor from the ownship position (in miles and meters).

ACQUISITION MARKER is a modification of the Graphics Cursor. This auxiliary NS tool is a square box with a dot in the center; it is used in different functions for acquiring objects displayed on the NS screen. To control the acquisition marker and obtain information on its position use the procedure similar to that used for controlling the Graphics Cursor.

3 USER WORK WITH NAVISAILOR SOFTWARE

3.1 Running the NS and Input of Initial Settings

3.1.1 Running the NS and Turning It Off

Detailed information on the NS first run procedure, which should be performed by TRANSAS engineers, is provided in the appropriate chapter of the "Technical Reference". This section is, therefore, concerned with the running of the NS with all the initial settings made and external output devices connected.

After the system is run, information on the license for the use of the product can be obtained. When this information is called, a window with the following information is displayed in the bottom part of the NS screen:

- name of the software product;
- expiry date of the license for its use;
- registration number;
- activator key number;
- list of open (licensed) and closed (not permitted) NS system options including the date until which updating for TRANSAS electronic charts can be received.

Depending on which OS the NS is operating in, the following procedures are used for running it:

- **In DOS**

1	2	3
Turn on the power on the PC		DOS is loaded (unless there is a setting for running the NS automatically)
Print "C: \TRANSAS\Transas" in the command line		Application Integrator is loaded (for its description see "Utilities" document)
Position the cursor on "NS" icon	<Run>	The NS is run

- **In Windows:**

1	2	3
Turn on the power on the PC and run the operating system		Application Integrator is loaded (unless there is a setting for running the NS automatically)
Position the cursor on "NS" icon	<Enter>	The NS is run

The remaining part of the NS running procedure is identical for both operating systems:

1	2	3
Use the keyboard to enter the PIN (see "Use of ARCS Format Charts " in "Utilities" document)	<Enter>	After the NS is run, a window for the input of Personal Identification Number is displayed (only if ARCS format charts are available in the ship's collection) The NS running procedure continues until the "Warnings on the Use of TRANSAS Charts" are displayed (to remove the window with the warnings press any key on the keyboard)
* Check the software license expiry date: CONFIG\License info	<Enter> <Esc>	Information window containing the above data is displayed in the bottom part of the NS screen To remove the information window
* Ascertain that the data exchange between the NS and external output devices is correct: CONFIG\Monitoring port	<Enter>	(sentence format used for the data exchange is detailed in the "Technical Reference" document) To activate the function indicator

Enter the number of the port which the external output device to be checked, is connected to	<Enter>	A sentence viewing window is displayed in the bottom part of the NS screen
	0	To remove the window from the NS display

Note: actions marked with* (asterisk) are performed as required.

3.1.2 Initial Parameter Input

After the running of the NS it is necessary to enter (or check the input of) the following parameters and settings required for the correct NS operation

1. Ownship's parameters:

1	2	3
CONFIG\Own ship setup	<Enter>	The 'Menu Area' displays a password input window
Enter the password	<Enter>	Ownship setup function sub-menu opens up in the NS Menu Area

In what follows, all the functions in column 1 of the table will refer to this submenu and will be marked with "\\" symbol.

Set the ship's maximum dimensions:		(for the correct display of the ship's contour)
\\ Length overall	From 1 to 500 m	Setting of the ship's maximum length
\\ Beam overall	From 1 to 99m	Setting of the ship's maximum breadth
Determine the exact position of the system's central display (Conning Station) :		(for re-calculating the current vessel position coordinates with regard to the Conning Station)
\\ Conning st. X	From -255 to 255 m	Input of the central display's displacement from the midship frame

\\ Conning st. Y	From -54 to 54 m	Input of a displacement from the centerline plane
Determine the exact position of the positioning systems' antenna units:		(for a correct presentation of the ship's hull relative to the antenna units of the devices)
\\PS1 (2) ant X	From -255 to 255 m	Input of antenna unit displacement from the midship frame
\\PS1 (2) ant Y	From -54 to 54 m	Input of displacement from the centerline plane
Determine the exact position of ARPA antenna units:		(to obtain information on the radar targets with the antenna's position taken into account)
\\ ARPA A (B) ant X	From -255 to 255 m	Input of antenna unit displacement from the midship frame
\\ ARPA A (B) ant Y	From -54 to 54 m	Input of displacement from the centerline plane
Set the height of the navigational bridge (if the value is less than 5 m):		(for calculating the visibility range of lights shown on the chart)
\\ Bridge elevation	From 1 to 99 m	
Turn ON/OFF the display of vector of the vessel's motion over the ground:		(vector length is set via ALARM\ Vectors function, see "Work with Radar Targets)
\\ COG vector	ON	To turn on the display of vector on the NS screen
	OFF	To turn off the display of vector
Turn ON/OFF the display of vector of the vessel's motion obtained from the gyro and log readings:		
\\ HDG vector	ON	To turn on the display of vector on the NS screen
	OFF	To turn off the display of vector

Set the type of the ship's symbol display on scales comparable to the ship's dimensions: \\ Ship by	 CONTOUR SYMBOL	(on smaller scales the vessel's symbol is automatically shown as two concentric circles) The vessel's symbol is represented by its contour with the vector originating in the positioning system antenna site The vessel's symbol is shown as two concentric circles with the motion vector originating in the center
Set the centreline plane's orientation relative to the ship motion vectors: \\ Align contour on	 COG HDG	 To set the centreline plane with regard to the track angle To set the centreline plane with regard to the gyro course
Determine the screen area which in the Navigation Mode will always be displayed ahead of the vessel: \\ Display reset to	 From 30 to 70 per cent	 As the ship's symbols approaches the limit determined by this setting, the screen is automatically redrawn, with the ship's symbol shifted back, in the direction opposite to the ship's course

2. Physical dimensions of the monitor's active area:

1	2	3
CONFIG\Monitor	From 250 to 800mm	To set the size of the monitor's active area (length of the diagonal)

ATTENTION! It is first necessary to adjust the display. To do this set the scale at 1: 10000, call ERBL function (F12), set the cursor in the center of the screen and press the button: in the mode of measuring ranges between the objects, select a distance between the center of the screen and a second point so that ERBL circle occupies a greater part of the display. Use the ruler to measure the circle's diameter vertically and horizontally. Adjust the monitor so that the diameter measured horizontally is equal to that measured vertically.

3. Number of watches and time of watch relief, which are used by the NS for generating an appropriate warning (see the next item in this paragraph). The default NS setting is a 4-hour watch schedule starting from 00:00 Ship's Time.
   To alter the above schedule use the following procedure:

1	2	3
LOGBOOK\Watch organization	<Enter>	The 'Menu Area' displays a system password input window
Enter the password	<Enter>	The Menu Area displays a watch schedule
Set the required number of watched per day in "Number of watch" line	From 1 to 24	A watch schedule is automa-tically displayed in the window
Set other watch schedules as required by activating the appropriate lines	<Enter>	

4. Alarm settings
   For the navigator to receive visual and audible notification that the vessel has sailed beyond the set limits, indicators of the following ALARM submenu functions should be switched to ON position (OFF or 0 positions imply that there is no tracking of the respective criteria), or a required value should be entered:

1	2	3
ALARM\Sound	ON OFF	To switch on audible alarm To switch off audible alarm
ALARM\Watch	From 1 to 99 min	To set an advance warning about the end of watch

ALARM\Least depth (for the NS operation with a sounder connected)	From 1 to 99 m	To switch on triggering of an alarm when a the current depth obtained from the sounder is less than a set
ALARM\Off chart	ON	To switch on triggering of an alarm as the ship sails beyond the current chart's limits with 'Automatic chart loading' OFF

5. Bringing the ship's time into correspondence with the time zone the vessel is in:

1	2	3
LOGBOOK\Set time zone	<Enter>	The "Menu Area" displays date and time input window
Set the moment of time when the ship's time is required to be changed	<Enter>	The cursor moves to the bottom section of the input window
Set the new date and time values for the given moment	<Enter>	The window disappears, the time will be changed in the NS are the indicated moment.

3.2 Vessel Positioning and Correction of the Vessel Position

3.2.1 Selecting the Positioning System for the Primary and Secondary Vessel Positioning

There are 4 positioning modes for both, primary and secondary vessel positions

1. PS1 - Positioning System [1] 1; and
2. PS2 - Positioning System [1] 2

In these modes the vessel positioning can use the following satellite and radionavigational systems:

- GPS in both, ordinary and differential (DGPS) modes;
- DECCA;

- LORAN in both, ordinary and differential modes;
- OMEGA in both, ordinary and differential modes.

To select a positioning system use the following procedure:

1	2	3
Check that the positioning system is connected to the NS and is functioning normally		(see "Technical Reference" and 'Running the NS and Turning It Off section)
Set the required positio-ning system option: SHIP\Primary (Secondary) pos.	PS1 or PS2	'NS Information Area" displays the positioning system's indica-tor and the coordinates obtained from it
ALARM\DGPS loss (when a GPS operating in differential mode is used)	From 3 to 99 sec	To set the maximum loss of GPS differential mode whereby the alarm will be triggered off
	0 sec	To switch off the tracking of differential mode loss
ALARM\Pos control (when the secondary vessel positioning is used)	From 0. 001 to 9. 999 miles	To set the maximum distance value between the primary and secondary vessel position, which when exceeded will generate an alarm
	0. 000 mile	To switch off the tracking of this discrepancy

Note: alarm messages displayed by the NS are listed in chapter "Alarm Messages and Recommended Actions"

3. ER (Echo Reference) - referencing the vessel position to the radar display of a fixed target ER

This mode allows continuous vessel positioning both for the primary and secondary vessel position (at the user's option) by the bearing and range to a fixed object (reference point with fixed coordinates - Echo Reference) acquired by the ARPA.

To turn on the mode use the following procedure:

1	2	3
ARPA\ARPA Info (or use <Shift>+ <F11> hot	ON	To display ARPA information
SHIP\Primary (Secondary) pos.	ER	Acquisition marker appears (see 'Graphics Cursor')
Position the marker on the target selected for the reference	<Enter>	The target is acquired whereupon the cursor obtains the shape of a 'Graphics Cursor'
Move the cursor to the electronic chart objects corresponding to the acquired target	<Enter>	The coordinates of the vessel position and radar targets are re-calculated with regard to the reference point

ATTENTION! As all the navigational calculations are made by the NS relative to the vessel position on the primary track,

1. When ER mode is turned on for the primary vessel position, all the targets obtained from the ARPA are plotted on the chart relative to this position, i.e. they shift by the value of the entered vessel position correction;
2. 2. When ER mode is turned on for the secondary track, it is only the selected reference target (marked on the screen with orange letters ER), which is shifted on the display by the distance whose value is set by the user.

4. DR - Dead Reckoning

In this mode the vessel position is calculated from the information obtained from gyro and log:

1	2	3
Check that the gyro and log sensors are connected to the NS and are functioning normally		(see "Technical Reference" and "Running the NS and Turning It Off section)
SHIP\Primary (Secondary) pos.	DR	To set the Dead Reckoning mode whereby the vessel position coordinates are calculated from the course and speed values

- For the manual input of course and speed use the following procedure

1	2	3
Disconnect log and gyro sensors from the NS		(see "Technical Reference")
SHIP\Correction Primary (Secondary) \Enter Course	<Enter>	'Menu Area" displays a data input window
Enter the course value	From 0 to 359. 9 degrees	'NS Information Area" displays the entered value
SHIP\Correction Primary (Secondary) \Enter Speed	<Enter>	Menu Area displays a data input window
Enter the speed value	From 0 to 90 knots	NS Information Area displays the entered value
SHIP\Primary (Secondary) pos.	DR	To set the Dead Reckoning mode whereby the vessel position coordinates are calculated from the course and speed values

3.2.2 Switching Automatically to the DR Mode

This mode is designed for switching automatically between the positioning systems in the following cases:

- when there is a loss of signals from the positioning system;
- when there is information that the received data is incorrect;
- when there is a loss of echo from the target selected for reference point in the Echo Reference mode. The switchover between the systems occurs as follows:

1) for the primary vessel positioning -
the primary vessel positioning is switched to the Dead Reckoning (DR) mode, whilst the secondary vessel positioning, if it used the DR, is switched off (NONE);
2) for the secondary vessel positioning -
the secondary vessel positioning is switched to the DR or off (NONE) if the DR is used for the primary vessel positioning.

To turn on this functionality use the following procedure:

1	2	3
Designate positioning systems for the primary and secondary vessel positioning	<Enter>	(See 'Selecting The Positioning System' for the primary and secondary vessel positioning)
SHIP\Auto change	<Enter>	'Menu Area" displays system password input window
Enter the password	<Enter>	The function's indicator is switched automatically to ON position

ATTENTION! It us recommended that this function should only be turned on for the purpose of automatic vessel control (e. g., for transmitting data to the autopilot connected to the NS).

3.2.3 Correcting the Vessel Position Using ARPA Information

Adding an offset value to the coordinates obtained from the GPS makes this correction. In this case the offset is calculated from the object's coordinates on the chart, and the object's bearing and range provided by the radar.
There are the following types of vessel position correction in the work with ARPA.

1. Correction by ARPA acquired target:

1	2	3
Check that ARPA is connected to the NS and is functioning normally		(see "Technical Reference" and "Running the NS and Turning It Off section)
ARPA\ARPA Info (or use <Shift>+ <F11> hot keys)	ON	To display radar information
On the electronic chart select an object intended to be used for correcting vessel position; acquire its counterpart with the ARPA		

SHIP\Correction Primary (Secondary) \0ffset by target	<Enter>	Acquisition marker appears (see 'Graphics Cursor')
Position the marker on the radar target mark on the electronic chart	<Enter>	The target is acquired whereupon the cursor becomes cross shaped
Move the cursor to the electronic chart object corresponding to the acquired target	<Enter>	The cursor indicates the new vessel position, whilst 'Menu Area" displays "Jump (Y/N)?" information window
Position the cursor on "Yes"	<Enter>	To move the vessel symbol to the point calculated by using the offset. Entered offset indicator appears in the 'NS Information Area"
Position the cursor on "No" or	<Enter> <Esc>	To cancel the correction

2. Correction of the vessel position by the ARPA cursor or ERBL position:

1	2	3
Check that ARPA is connected to the NS and is functioning normally		(see "Technical Reference" and 'Running the NS and Turning It Off section)
ARPA\ARPA Info (or use Shift>+ <F11> hot keys)	ON	To display radar information
ARPA\ARPA cursor (ARPA\ARPA ERBL) On the ARPA screen position the cursor (movable ERBL point) on a conspicuous object intended to be used for correcting vessel position	ON	To display ARPA cursor (ERBL) on the NS screen (in the green color) On the NS screen the cursor (ERBL) is displayed in the green color
SHIP\Correction Primary (Secondary) \0ffset by ARPA cursor (ERBL)	<Enter>	To display a 'Graphics Cursor'

Move the cursor to the electronic chart object corresponding to the acquired target	<Enter>	The cursor indicates a new vessel position "Jump (Y/N)?" information window is displayed in the "Menu Area"
Position the cursor on "Yes"	<Enter>	To move the vessel symbol to the point calculated by using the offset. Entered offset indicator appears in the 'NS Information Area"
Position the cursor on "No" or	<Enter> <Esc>	To cancel the correction

3.2.4 *Manual Correction of the Vessel Position*

Manual correction can be used in the following cases.

- in DR (Dead Reckoning) mode when positioning data from different positioning sources is required to be entered;
- when the position sensor (e. g., GPS) is connected to the NS, but the vessel position coordinates it provides are displayed by the NS with an error identified by the navigator by using come other positioning source.

The following procedures can be used for correcting the vessel position:

1. Setting the vessel symbol in the latest observation position:

1	2	3
SHIP\Correction Primary (Secondary) \New pos'n by cursor	<Enter>	To display the 'Graphics Cursor'
Position the cursor on the observation point; or press <Tab> key to switch the cursor activity to the information window and enter the coordinates manually	<Enter>	"Jump (Y/N)?" information window is displayed in the 'Menu Area"

Position the cursor on "Yes"	<Enter>	To move the vessel symbol to the point calculated by using the offset. Entered offset indicator appears in the 'NS Information Area"
Position the cursor on "No" or	<Enter> <Esc>	To cancel the correction

Note: In case of a repeated manual correction of the vessel position new offset values are calculated.

2. Digital input of the latest observation point coordinates.
   This type of manual correction is used in DR mode only when the vessel's coordinates are known:

1	2	3
SHIP\Correction Primary (Secondary) \Enter Position	<Enter>	Menu Area displays a coordinate input window
Enter the required coordinate values group by group	<Enter>	To move the vessel symbol to the observation position, the entered coordinates (for the primary vessel position only) are displayed in the 'NS Information Area"

3. Input of offset to the coordinates received from a positioning system:

1	2	3
SHIP\Correction Primary (Secondary) \Enter Offset	<Enter>	Correction input window is displayed in 'Menu Area"
Enter the required coordinate values group by group	<Enter>	To move the vessel symbol to the point calculated by using the offset. Entered offset indicator appears in the 'NS Information Area" (for the primary positioning only)

3.2.5 Canceling all the Entered Offsets in the Correction of the Vessel Position

To cancel the input of offset to the coordinates received from a positioning system use the following procedure.

1	2	3
SHIP\Correction Primary (Secondary)\ Cancel Offset	<Enter>	To move the vessel's symbol to the position with coordinates obtained from the positioning system (without offset) In the 'NS Information Area" the entered offset indicator disappears

3.3 Setting the Parameters and Operation in the Voyage Monitoring Mode

3.3.1 Setting the Parameters for Monitoring Safety at Sea

To switch on the Voyage Monitoring mode, and to check the plotted route (see 'Creating a Route Plan with a Check for the Presents of Dangers to Navigation') set the following parameters:

1	2	3
SHIP\Scale	<Enter>	A list of fixed scale values is displayed in the "Menu Area"
Position the cursor on the required scale	<Enter>	To set the electronic chart scale so that only charts on scales larger than the set one are taken into account in the 'Voyage Monitoring Mode'
SHIP\Safety depth	From 0 to 99m	To set a depth value (in meters from the sea level) which is considered safe for the given vessel with regard to the isolated dangers to navigation

SHIP\Safety contour	From 0 to 99m	To set the digital value of a numbered depth contour on the vector chart which is considered to be safe for the given vessel

Note: if the specified depth contour is not numbered on the chart, the effective safety contour will be taken to be larger than the set one.

ATTENTION! The safety contour value cannot be more than the set safety depth.

Besides, you can plot symbols of dangers to navigation and guard zone as required on the user chart; when these are approached or crossed, an alarm will be triggered off (see "Creating User Charts').

3.3.2 Setting the Alarms in Voyage Monitoring Mode

For the navigator to receive visual and audible notification that the vessel has sailed beyond the set limits in the Voyage Monitoring mode, indicators of the following ALARM submenu functions should be switched to ON position or set to a required value (OFF or 0 positions imply that there is no tracking of the respective criteria):

1	2	3
ALARM\Guard zone	ON	To switch on triggering of an alarm as the vessel is crossing a Guard Zone contained in the user chart (see 'Creating User Charts')
ALARM\Danger	From 0. 1 to 8. 0 miles	To set the approach distance to the isolated danger, whether on an electronic or user chart, for the advanced triggering of an alarm (see 'Voyage Monitoring Mode')
ALARM\ Sf. contour time	From 1 to 15 min	To set an advance time for triggering of an alarm as the vessel is approaching a safety contour

ALARM\ (Special Purpose Area type)	ON	To switch on triggering of an alarm on the approach to the respective Special Purpose Areas (see "Alarm Messages on the Approach to Special Purpose Areas')
ALARM\TIME	From 1 to 15 min	To set the advance time for triggering of an alarm as the vessel is approaching a Special Purpose Area

☞ ***Note: Alarm messages displayed by the NS are listed in chapter 'Alarm Messages and Recommended Actions'.***

ATTENTION! 'Setting the alarms in the Voyage Monitoring Mode' should be preceded by 'Settings the Parameters for Monitoring Safety of Navigation".

3.3.3 Settings for the NS Operation in the Navigation Mode

It was mentioned before (see "Navigation Mode') that this mode of the NS operation is a special case of Voyage Monitoring Mode and implies a permanent display of the ownship's symbol; it also provides a navigator with a set of data on the navigational conditions in a form easy for perception. This data includes among other:

- display of the vessel's primary and secondary tracks;
- display of Scale Bar segment equivalent to a mile/cable (depending on the current scale) providing a ready illustration of scale for estimates made by eye;
- easily perceived screen color palette (selection depends on the time of the day)

To implement these NS functional capabilities use the following procedure

1	2	3
Turn on Navigation Mode. AHEAD (or press <F8> hot key)		To "attach" the vessel symbol to the chart and display it on the NS screen

Determine the length of the displayed vessel's track over the set period of time:		
LOGBOOK\Own ship track	From 1 to 24h	To display the vessel's track over the set period of time (in hours)
	0 h	To display the vessel's "trail" left within the last 6 minutes only
Select color for the display of the ownship's track: LOGBOOK\Track color	<Enter>	Menu Area displays a seven-color palette
Position the cursor on the selected color	<Enter>	The track is drawn in the selected color
Select the most suitable screen color palette (hot keys for turning on the given palette are given in brackets):		Selection of color palette should depend on the time of the day:
CONFIG\Display color set\ Daylight (or <Alt>+ <F1>)	<Enter>	Daytime
CONFIG\Display color set\ Twilight (or <Alt>+ <F1>)	<Enter>	Twilight
CONFIG\Display color set\ Dusk (or<Alt>+ <F1>)	<Enter>	Moonlit night (NS Information area is shown against white background)
CONFIG\Display color set \Night (or<Alt>+ <F1>)	<Enter>	Moonless night (NS Information area is shown against white background)
CONFIG\Display color set \Dusk Inverted (or <Alt>+ <F1>)	<Enter>	Moonlit night (NS Information area is shown against black background)
CONFIG\Display color set \Night Inverted (or <Alt>+ <F1>)	<Enter>	Moonless night (NS Information area is shown against black background)
Turn on the display of "Scale Bar" as required (see above):		(see also 'Turning ON/ OFF the Display of Various Information Layers', item 2)
CHART\Information layers \Scale bar	ON	On scales larger than 1: 100, 000 a segment

		equal to a mile or cable (depending on the current scale) appears in the left-hand part of the Chart Area

3.3.4 Auxiliary NS Facilities Used in the Voyage Monitoring Mode

During the NS operation in the Voyage Monitoring Mode the following facilities can be used for the display of the vessel's position with regard to the dangers to navigation and monitoring of the vessel's approach to them:

1. Display of a line presenting graphically the monitoring of crossing of the following electronic chart objects:
   - safety contour;
   - special purpose area limits (see 'Alarm Messages on the Approach to Special Purpose Areas').

To display such line use the following procedure:

1	2	3
SHIP\Guard vector	ON	An orange line appears in the vessel's position going in the direction of the current course over the ground; the fact the crossing of aforementioned objects is monitors, is shown with two strokes on this line.
	OFF	To turn off the display of line presenting the monitoring of crossing of the safety contour and special purpose area limits

ATTENTION! The line representing monitoring of crossing of the safety contour and special purpose area limits cannot be displayed until after 'Setting the Parameters for Monitoring Safety of Navigation' and 'Setting the Alarm in Voyage Monitoring Mode'.

2. Display of a circle presenting graphically monitoring of approach to the isolated dangers to navigation (see Voyage Monitoring Mode'):

1	2	3
SHIP\Guard ring	ON	An orange colored circle is drawn on the screen, centered in the current vessel position and with the radius equal to the range set in *ALARM\Danger* function
	OFF	To turn off the display of such circle

ATTENTION! The circle representing monitoring of crossing of an isolated danger to navigation cannot be displayed until after 'Setting the Parameters for Monitoring Safety of Navigation' and 'Setting the Alarm in Voyage Monitoring Mode'.

3. Display of the ownship's course aligned with one of the directions specified below and selected in *CONFIG\Own ship setup\Align contour on* function (see 'Initial Parameter Input'):

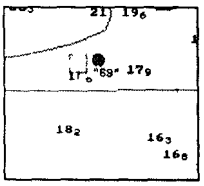
- in the direction of the vessel's COG (course over the ground) vector,
- along the gyro course (HDG).

To display such line use the following procedure:

1	2	3
SHIP\Head line	ON	An orange colored course line originating in the current vessel's position is displayed on the NS screen
	OFF	To turn off the display of such line

4. Obtaining information on the changes in DR bearing and range to any fixed point both, within and beyond the displayed chart fragment

To obtain such information use the following procedure:



1	2	3
TASK\OBJECT	<Enter>	An acquisition marker appears (see 'Graphics Cursor')
Position the marker in the required point	<Enter>	The marker box is fixed on the selected objects (see fig.) whilst the data on range and bearing to this objects is displayed in the appropriate section of the 'NS Information Area"

To turn off object tracking:

1	2	3
TASK\OBJECT	<Enter>	The acquisition marker box and the object data disappear from the NS screen and Information Area respectively

5. To set the timer for the alarm to be triggered off after the time interval selected by the navigator, use the following procedure:

1	2	3
ALARM\Set timer	<Enter>	The 'Menu Area" displays a date and time input window
Set the moment of time when the alarm is required to be triggered off	<Enter>	

Note: alarm messages displayed by the NS are listed in chapter 'Alarm Messages and recommended Actions '.

3.3.5 Obtaining Additional Information During the NS Operation in the Voyage Monitoring Mode

1. Setting one of the four display type of the NS Information Area to present the required data:

1	2	3
CONFIG\Display (or press successively <Tab> hot key)	SYSTEM	In the 'NS Information Area" Display System mode is turned on, providing the data on the sailing conditions
	ROUTE	Display Route mode is turned on providing the data on the vessel's position with regard to its route

	PILOT	Display Pilot mode is turned on, providing information on the vessel's position with regard to the current WP from the loaded voyage schedule
	WEATHER	Display Weather mode is turned on, providing the data on weather conditions

2. Obtaining more detailed information on the quality of GPS positioning on the primary track. The positioning is assessed on the basis of GGA sentence received from GPS sensor (see "Technical Reference"); the following data is involved:

- Fix UTC - position fix time;
- Lat and Lon - geographic latitude and longitude of the obtained Vessel position;
- Quality - positioning status (DGPS, GPS, INVALID);
- Satellites - number of satellites used for positioning;
- HDOP - geometric factor;
- Data Age - information delay;
- Station ID - the number of differential mode support station.

To turn on the display of this information use the following procedure:

1	2	3
CONFIG\Primary status info	<Enter>	Information window containing the aforementioned data appears in the 'Menu Area"

3. Display of the current vessel position coordinates with different precision:

1	2	3
CONFIG\Precision	. 001'	Vessel position coordinates are displayed in the 'NS Information Area" with a precision of up to three digits after the whole number of minutes
	. HIGH	The NS Information Area displays only minutes of latitude and longitude with a precision of up to 5 digits after the decimal point

4. Measuring ranges and obtaining the following information on any point in the Chart Area:

- Lat and Lon - the point' coordinates;
- Brg and OppBrg - values of bearing and reciprocal bearing from the ownship to this point;
- Rng - range from the ownship to the point in question (in miles and meters);
- CPA and TCPA - time and distance of the closes approach to the point in question if proceeding along the current course at a current speed.

This kind of information can be obtained by using the NS electronic range and bearing line (ERBL), which allows measuring ranges between any points. This NS facility includes the display:

- of a fixed point "attached" to the current vessel position or to any point on the electronic chart;
- of the ERBL movable point formed by the range ring crossing the bearing line, and which is moved by using the trackerball or cursor control keys. To measure ranges between two points use the following procedure:

1	2	3
ERBL	<Enter>	A 'Graphics Cursor" appears on the NS screen, whilst the "Menu Area" displays a window with the aforementioned information referring to the cursor position with regard to the current vessel position
Position the cursor in the point which the range is required to be measured from	<Enter>	The ERBL stationary point is fixed in this position on the electronic chart
Move the ERBL movable point to the chart point whose range is required to be measured		The information window displays data on the movable point (including the measured range between the two points)

Note: the cursor can be set in the required point of the electronic chart by entering the point's coordinates manually after switching the cursor's activity to the information window by pressing <Tab> key.

5. Saving the screen's graphic copy with all the information it displays, for the future review and printout.

A screen copy is saved in the form of files stored on the disk in BMP subdirectory. Each such file is assigned a name corresponding to the system (computer) moment of time when the recording was made: "hours-minutes-seconds". Facilities of "Data Tool" utility (see "Utilities" document) or graphic editors handling *.bmp format, are then used for reviewing and printing out such copies.

To create a graphic copy of the screen use the following procedure:

1	2	3
Display NS screen required to be saved	<Ctrl>+ <Print Scrn>	A copy of the displayed screen is automatically saved onto the disk

3.4 *Work With Electronic Charts*

3.4.1 Automatic Chart Loading

In this mode of the NS operation the change of charts is effected automatically, the largest scale chart being always displayed on top of the rest.

1. Automatic change of charts in accordance with the vessel's position as it is proceeding along the route:

1	2	3
CHART\Chart autoload	ON	To switch on Automatic Chart Loading

In this case the scale of an automatically loaded charts can correspond to the display's current electronic scale:

1	2	3
CHART\Chart autoscale	OFF	To switch off automatic scaling mode

- to the loaded chart's scale:

1	2	3
CHART\Chart autoscale	ON	To switch on automatic scaling mode
CHART\Autoscale ratio	Positive numbers (from 0 to 5)	To make an automatically set scale smaller than the scale of the respective source chart by an indicated number of fixed range positions
	0	Original chart scale
	Negative numbers (from -5 to 0)	To make an automatically set scale larger than the scale of the respective source chart by an indicated number of fixed range positions

2. Automatic change of charts during the work with any function using the graphics cursor:

1	2	3
CHART\Chart autoload	ON	To switch on Automatic Chart Loading

The scale of an automatically loaded chart can be altered manually only (see "Scaling of an Electronic Chart Display").

3.4.2 Loading Charts Required by the User

Charts can be loaded "manually" in one of the following ways:

1. By displaying any of the charts, which the vessel's route happens to be within:

1	2	3
CHART\Load-Pos'n	<Enter>	A list with numbers of charts arranged according to their scales, which the vessel's route falls within, is displayed in the 'Menu Area"
Highlight the number of the chart required to be loaded	<Enter>	The selected chart without change of scale, "Automatic

		chart loading' by the vessel's position being automatically locked *(CHART\Chart autoload* function's indicator in FIX position) until the vessel sails beyond the selected chart's bounds or within the NoData area on this chart (see 'Chart Area')

2. By displaying any chart from the collection by its number:

1	*2*	*3*
CHART\Load List	<Enter>	A list with numbers of charts making up a complete ship folio and arranged in the alphabetic order is displayed in the 'Menu Area" (see note)
Highlight the number of the chart required to be loaded	<Enter>	The selected chart is loaded on its original scale, its center being coincident with the center of the Chart Area

Note: the list of charts includes:

- *chart number and scale;*
- *chart type and source -*

  A - British Admiralty raster charts (ARCS format);
  B - raster charts by the HO's of the USA and Canada (BSB/NDI format);
  D - vector charts converted from S57 format charts by the Hydrographic Offices, to TRANSAS v. 8. 0 format;
  S - vector charts converted from other formats to TRANSAS v. 6. 0 format;
- *blank space - TRANSAS MARINE vector charts.*

ATTENTION! When *CHART\Load-List* function is invoked, the 'Navigation Mode' is automatically exited from.

3. By fixing the chart currently under the vessel's symbols ('Automatic Chart Loading' mode locked):

1		2	3
3.4.2.1.1	**CHART\Chart autoload**	FIX	Automatic unlocking occurs when the vessel sails beyond the chart's limits or is within No Data area on this chart (see 'Chart Area')

4. By loading the chart by the cursor position:

1		*2*	*3*
3.4.2.1.1.1	**REVIEW**	<Enter>	'Graphics Cursor' appears
Position the cursor on the selected chart fragment		<Enter>	The current chart is re-drawn around the position with the cursor's coordinates
		Successive presses on <Enter>	To load with each press (if the cursor remains in place), one by one, all the charts for the given area available in the collection, beginning with the largest scale chart and ending with the map of the world.

3.4.3 Changing the Order of Overlaying the Displayed Charts

If the NS screen displays several chart frame, the navigator can select the order in which they will be overlaying each other.

There are two ways to alter the order of overlaying the displayed charts.

1 By selecting the chart to be displayed on top of the rest on the list:

1	*2*	*3*
	<Ctrl>+ <L>	'Menu Area" displays a list of displayed charts in the order of their overlaying
Position the cursor on the required chart	<Enter>	The selected chart is displayed by the NS on top of the rest

2. By selecting the chart with the graphics cursor:

1	2	3
	<Ctrl>+ <0>	'Graphics Cursor' appears (see Fig. 3–1)
Position the cursor on the visible fragment of the required chart	<Enter>	The selected chart is displayed by the NS on top of the rest

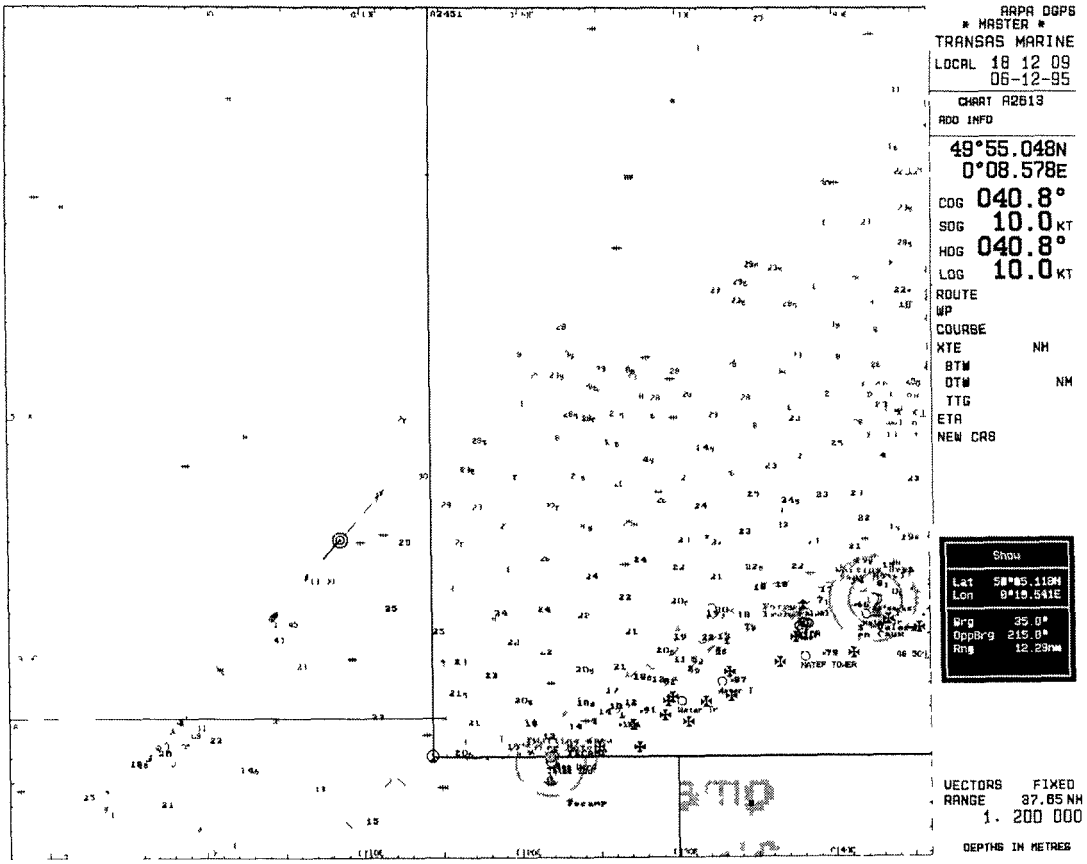


Fig. 3–1

3.4.4 Chart Unloading

1	2	3
CHART\Charts unload	<Enter>	Only chart boundaries with numbers and coordinate grid remain on the NS screen

3.4.5 Turning ON/Off the Display of Various Information Layers

In compliance with requirements of international and national standards to ECDIS class systems, all information displayed on the electronic charts is grouped into three categories.

1) Base Display includes classes of information whose display is not allowed to be turned off under any circumstances. Such objects include:

- coastline;
- depth contours and isolated dangers with depths over them less than the safety contour and safety depth respectively as determined in the "Settings of Parameters for Monitoring Safety of Navigation';
- aids to navigation;
- recommended routes;
- traffic separation schemes.

2) Standard Display includes classes of information layers essential for Navigation and route planning modes; when any of these is turned off "LAYERS LOST' message is displayed. They include:

- drying heights;
- limits of fairways and channels;
- landmarks;
- areas with special navigation conditions;
- warnings.

3) Additional Information Display contains classes of other information, which are not included in the first two categories. These are:

- spot soundings;
- isolated dangers with depths over them exceeding the safety depth;
- submerged cables and pipelines;

- ferry routes;
- names;
- all depth contours deeper than safety contour;
- seabed;
- boundaries of all charts available in the ship folio;
- currents;
- other information.

In addition to the items of information listed above and required by the standard, this category also includes:

- auxiliary information supplied in the vector form with BSB format raster charts (Marine facilities).

In operating the NS it is possible to use facilities for turning off the display of individual object classes to declutter the electronic chart display on the NS screen. There are several ways to solve this task:

1. By turning on/off the display of coordinate grid:

1	2	3
CHART\Grid lines	ON OFF	To turn on the display To turn off the display of coordinate grid lines

2. By turning on/off the display of objects of one class:

1	2	3
CHART\Information layers\ (object class)	OFF	To turn off the display of the given class objects (see above Additional Information Display)
	ON	To turn on their display

3. By turning on/off the display of depths exceeding the set one:

1	2	3
CHART\Information layers\ Spot soundings to	From 1 to 999 m 0 m	To turn off the display of depths exceeding the set one To turn on the display of all depths

4. By turning on/off the display of objects of various categories:

1	2	3
CHART\Information layers\ Standard display	OFF	To show the Base Display objects only on the screen (see above)
CHART\Information layers\ Standard display	ON	To show the Base Display and Standard Display objects on the screen
CHART\ AII information	<Enter>	To display the objects of all the categories

3.4.6 Viewing Other Charts and Navigation Areas

1	*2*	*3*
CHART\Chart autoload	ON	To turn on the Automatic Chart Loading mode
REVIEW	<Enter>	'Graphics Cursor' appears (see Fig. 3–2)
Position the cursor on the selected chart fragment	<Enter>	The current chart is re-drawn around the position with the cursor's coordinates (centering)
	<Esc>	To exit from the viewing mode to the NS main menu

3.4.7 Scaling of Electronic Chart Display

1. Setting the desired chart scale regardless of which scale they are created on:

1	2	3
CHART\Chart autoload	ON	To switch on 'Automatic Chart Loading" mode
SCALE	<Enter>	A list of possible scale values from 1: 1000 to 1: 200, 000, 000 is displayed in the 'Menu Area" (see Fig. 3–3)

Position the cursor on the desired value	<Enter>	The current (or a more suitable chart) is re-drawn around the new center but on a new scale and within new bounds accordingly

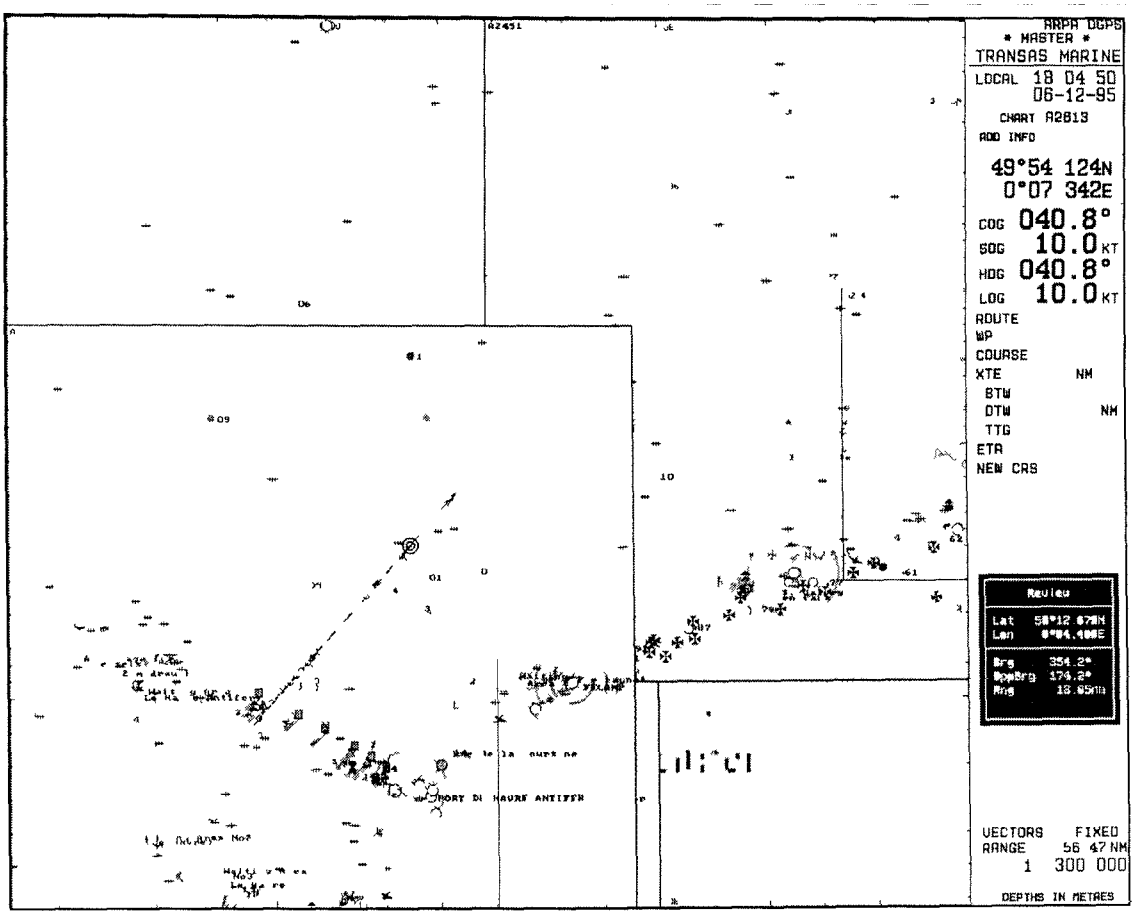


Fig. 3–2

2. Setting the desired scale using the hot keys by going through the possible values

1	2	3
CHART\Chart autoload	ON	To switch on 'Automatic Chart Loading' mode

	<+ >	To increase scale by one point in its range of possible values
	<->	To reduce scale by one point in its range of possible values

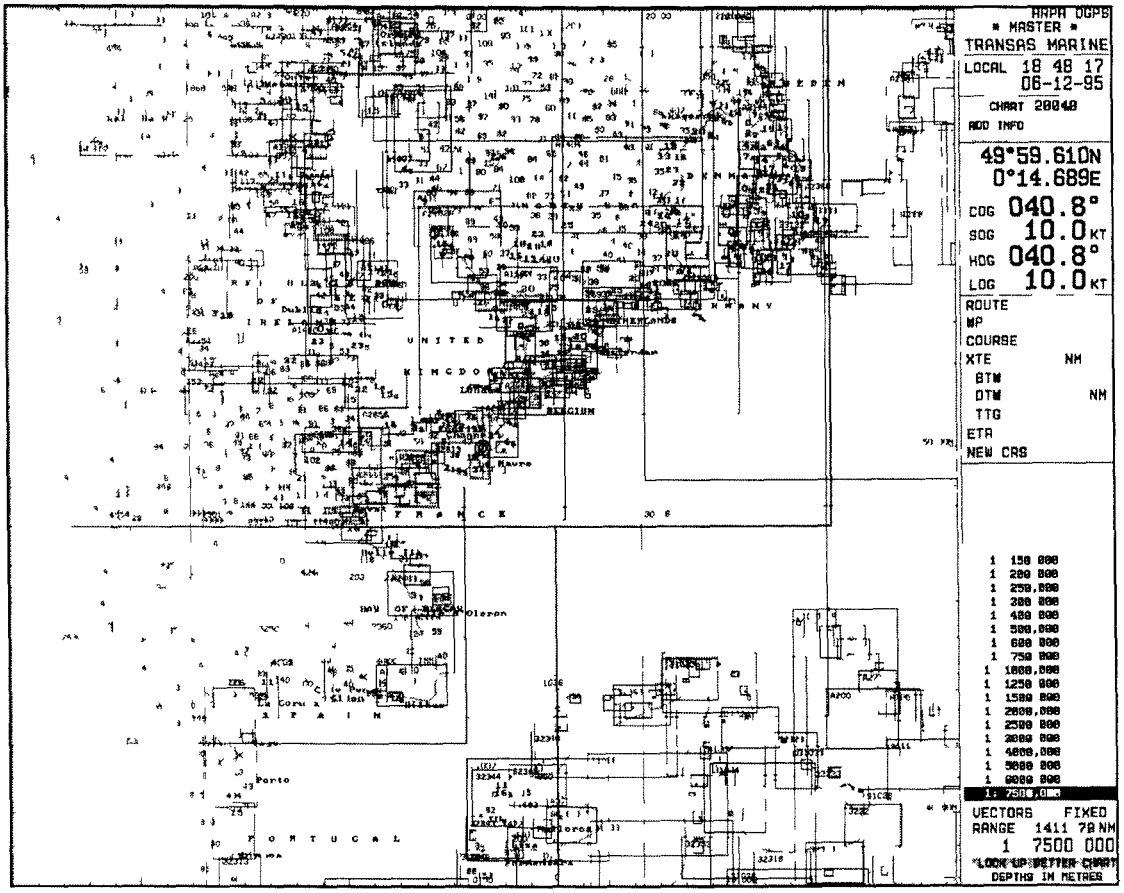


Fig. 3–3

3. Setting the desired scale by zooming out the fragment of interest as delineated by the user

1	2	3
ZOOM	<Enter>	'Graphics Cursor' appears
Position the cursor in the corner of the selected fragment	<Enter>	To fix the frame corner

Delineate the fragment of interest	<Enter>	The display is re-drawn within new boundaries and on a new scale

4. Setting the original scale of the selected chart:

1	2	3
Load the selected chart		See 'Loading Charts Required by the User'
**** CHART\Chart autoscale***	ON	To switch on automatic scaling mode
**** CHART\Autoscale ratio***	Positive numbers (from 0 to 5)	To make an automatically set scale smaller than the scale of the respective source chart by a set number of possible values
	0	Original chart scale
	Negative numbers (from -5 to 0)	To make an automatically set scale larger than the scale of the respective source chart by an indicated number of fixed range positions
CHART\Original scale	<Enter>	To display the chart on a scale equal to that of the original paper chart

Steps marked with* symbol may be made as required.

Note: Changes in scale are accompanied by the change in values of the current horizontal screen span and chart scale displayed in the NS Information Area which may also display warning messages (see 'NS Information Area').

3.4.8 Obtaining Information from an Electronic Chart

The NS permits obtaining information on the objects plotted:

1. On vector charts:

1	2	3
INFO	<Enter>	Acquisition marker appears (see 'Graphics cursor')

1	2	3
CHART\Raster chart INFO	ON	
INFO	<Enter>	Acquisition marker appears (see 'Graphics Cursor')
Acquire the object which it is necessary to obtain information on	<Enter>	A window appears in the in the bottom part of the NS screen displaying information on the acquired object obtained from data in the appropriate Transas Marine vector charts

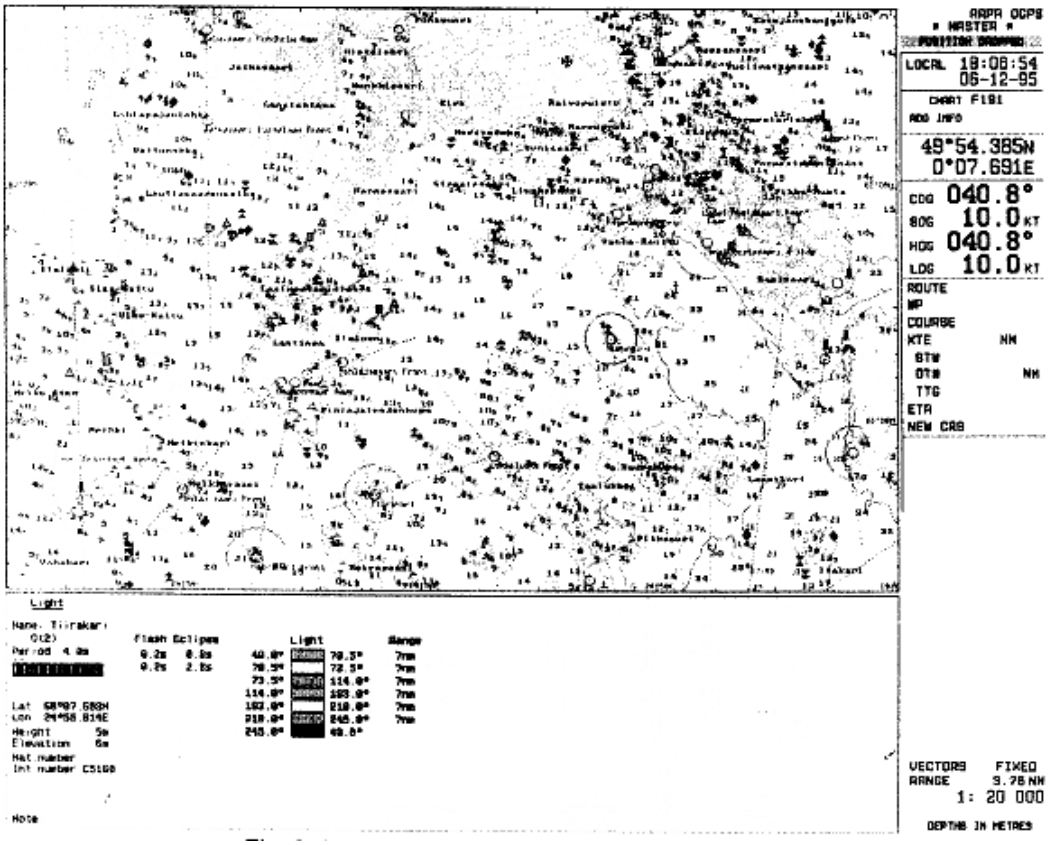


Fig. 3–4

Note: to acquire objects use the following procedures:

1. For a point type chart object (lighthouse, buoy, beacon, "i" information sign) - position the marker so that the required object is within its box;
2. For a line or zone (recommended routes, cables, pipelines, separation lines, areas, etc.) - position the marker on any line segment;
3. For the displayed chart - position the marker on any chart space free of the chart objects;
4. For any of the charts whose outlines are displayed in the chart area -position the marker so that one of the chart frame corners is under the marker.

2. On the displayed ARCS and BSB format raster charts from the data contained in the matching (in the frame size) TRANSAS vector charts:

ATTENTION! It should be remembered that the two charts: the raster chart where the object is shown, and the vector chart which the information is taken from, may not match each other in the updating, edition and even source. To obtain full information on both charts for a comparison use INFO function.

3.4.9 Setting Parameters for Work with S57 Format Electronic Charts

In the NS, S57 ed. 3 formats ENC (electronic navigational charts) are displayed in full compliance with S-52 requirements to the ECDIS.

With this in mind, the following facilities for easy work with DX-90 format charts have been implemented in the NS.

1. Highlighting shallow and deep water areas (setting the safe passage zones):

1	2	3
CHART\DX chart options\ Four shades	YES	To turn on the depth zone highlighting with color
	NO	To turn off the depth zone highlighting
SHIP\Shallow contour	From 0 to 99 m	To set the value of a shallow water contour which the deep water area will be distinguished from in color on the displayed S57 chart
SHIP\Deep contour	From 0 to 99m	To set the value of a deep water contour which the shallow water area will be distinguished from in color on the displayed S57 chart

Note: If the set values of a shallow or deep water contours have no corresponding digitized depth contours on the chart, the closest value depth contours are taken for the said shallow and deep water contours.

ATTENTION! The shallow water contour value cannot be more, and the deep-water contour value cannot be less than the set safety contour (see 'Setting the Parameters for Monitoring Safety of Navigation')

2. Turning on/off the hatching in the display of areas with depths less than a safety contour:

1	2	3
Set the safety contour		(see "Setting the Parameters for Monitoring Safety of Navigation')
CHART\DX chart options\ Shallow pattern	YES	To turn on the display of hatching in the area limited by the coastline and safety contour
	NO	To turn off the display of hatching

3. Selecting the generalization method (display of objects depending on the current scale):

CHART\DX chart options\ Use SCAM IN	YES	To turn on a standard S57 format generalization
	NO	To turn on a similar generalization mode for Transas Marine charts

4. Selecting the style of object display:

1	2	3
CHART\DX chart options\ Style	PRESLIB (presentation library)	To turn on SENC display style in full compliance with S52 App. 2
	TRANSAS	To turn on the display style close to that used in Transas Marine charts
CHART\DX chart options\Areas	PLAIN (plain area boundary symbols)	To turn on the display of boundaries of area type chart objects shown as lines only
	SYMBOLIZED (symbolized area boundary symbols)	To display the limits of area type chart objects as lines and conventional signs.
CHART\DX chart options\Points	PAPER CHART	To display point type chart objects in the form of symbols used in a paper chart.
	SIMPLIFIED	To display point type chart objects using simplified symbols
CHART\DX chart options\ Full light lines	YES	To display lines limiting the visibility sectors of aids to navigation.
	NO	To display the visibility sectors in standard length lines

ATTENTION! When the display style, close to that in TRANSAS charts, is selected, there is a deviation from S-52 requirements to the display of S57 format charts.

3.4.10 Work with ARCS Format Raster Charts

When ARCS format raster charts are displayed, the NS provides the user with the following facilities for easier work with these charts.

1. The mode ensuring compliance with UKHO requirements to the display of ARCS format electronic raster charts (see 'Specific Features Of Using ARCS Format Charts'):

1	2	3
CHART\Priority	ARCS	To display ARCS format charts on the NS screen on top of charts in other formats
	ECS	To turn on ECS mode

2. Viewing the entire information printed on the original paper chart which ARCS chart was made from, including information beyond the chart frame.

1	2	3
CHART\Review ARCS chart	<Enter>	'Graphics Cursor' appears and a raster chart outline is displayed on the NS screen
Position the cursor on the chart fragment, which should be viewed.		

☞ *Note: The above two NS functions are not available on the menu unless there are some ARCS charts in the folio.*

3. Obtaining information on objects shown on the raster charts (see 'Obtaining Information on the Electronic Chart', item 2).

3.5 Work with ARPA

3.5.1 Setting the Alarms in Work with ARPA

These settings serve as criteria for identifying dangerous radar targets the target is considered to be dangerous when both limitations specified below are exceeded.

For visual and audible notification to the navigator that ARPA tracked targets have exceeded such limitations, it is necessary to set the numeric values in the indicators of the following ALARM submenu function (0 position implies canceling the tracking based on the relevant criterion):

ALARM\CPA	From 0. 1 to 99. 9 miles	To set the closest point of Approach (CPA) distance to the target
ALARM\TCPA	From 0. 1 to 99. 9 min	To set the minimum value for the time before the moment of closest approach to the target (TCPA)

Note: The alarm message, which is displayed when the two set limitations are exceeded, is provided in chapter 'Alarm Messages and Recommended Actions'.

3.5.2 Work with Radar Targets

Work with targets acquired by ARPA includes the display of all the tracked targets on the NS screen, and the display of their parameters in the table of targets (see below). Targets are displayed in the NS as described below:

- all the targets are designated distinct names containing the index of the source of radar information, and the number. NS can operated with the following sources of radar information (indexes are given in brackets):

- primary ARPA (A);
- secondary ARPA (B);
- Radar Integrator soft- and hardware unit (R);
- AIS, AEROSPACE transponders (targets obtained from the transponder are shown in the form of a triangle and are processed by the system on the same principles as ARPA targets).

To obtain more detailed information on the sources of radar information and their connection see "Technical Reference";

- a symbol of the radar target is a circle with a speed vector. Depending on the target's aspect, its symbol may be in one of the following colors (according to whether the vessel's side or stern lights are visible):
  - read - if the target's portside is observed;

- green - if the target's starboard is observed;
- yellow - if the target is turned to the ownship with its stern;
- magenta - if the target is stationary (speed of up to 2 knots),

- target vectors are shown in two colors depending on the degree of danger they constitute, which is determined from CPA and TCPA values (see "Setting the Alarms in Work with ARPA"):
  - green for the targets, which constitute no danger;
  - red for the dangerous targets;
- targets' "trails" display their minute tracks with a plotting interval of 3 seconds, and at least 12-minute points.

The TABLE OF TARGETS which is displayed in the bottom part of the NS screen (see Fig. 3–5), contains the following parameters:

- Number - target's name;
- CPA - distance to the closest point of approach (CPA distance);
- TCPA - time to the closest point of approach (TCPA time);
- Course - true course;
- Speed - speed;
- Range - radar target's range;
- Bearing - radar target's bearing;
- Bow X - range to the crossing of courses;
- TBow X - time to the crossing of courses.

CPA and TCPA values, as well as the names of dangerous targets (see 'Setting the Alarms in Work with ARPA') are highlighted with the orange color in the table. The target, which serves as a reference point (see 'Selecting the Positioning System' for the Vessel's Primary and Secondary Positioning, item 3), is shown with the brown color.

To leaf through and view the tables of targets use the trackerball or the following keys on the keyboard:

- <Ctrl>+ cursor control key - to view the top and bottom part of the table, or to move one column to the left/right;
- <Ctrl>+ <PgUp> - to move 10 columns to the left;
- <Ctrl>+ <PgDown> - to move 10 columns to the right;
- <Ctrl>+ <Home> - to move to the beginning of the table;
- <Ctrl>+ <End> - to move to the end of the table;
- <Alt>+ <End> - to display parameters of 14 radar targets last tracked by the ARPA (regardless of whether the cursor is in the table or not).

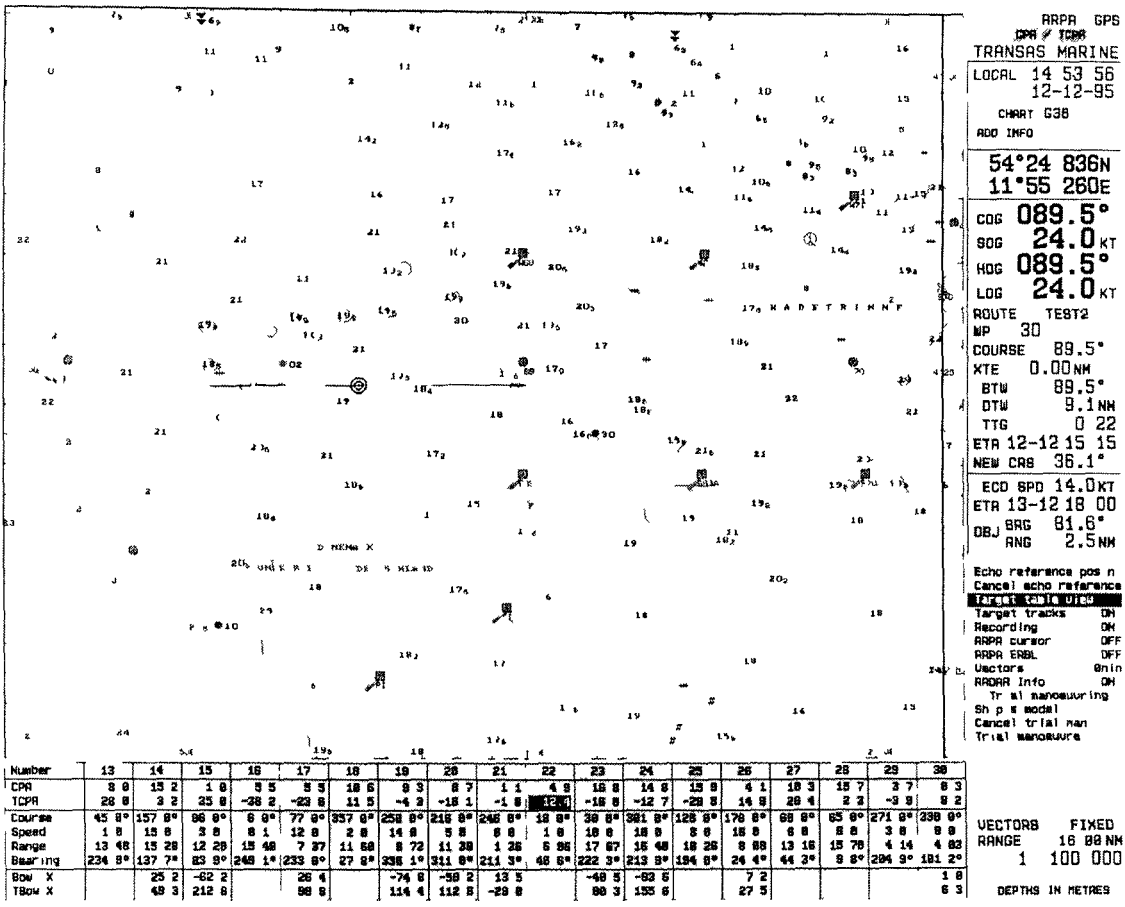


Fig. 3–5

To display radar targets and their parameters on the NS screen use the following procedure

1	2	3
ARPA\ARPA Info (or use Shift>+ <F11> hot keys)	ON	To display radar information ARPA acquired targets are displayed on the NS screen
Turn ON/OFF the display of targets' "trails" ARPA\Target tracks	ON	To display "trails" on the NS screen

	OFF	"Trails" are not displayed on the NS screen.
Set the vector length for the targets and the ownship		
ARPA\Vectors	From 1 to 99 mm.	To display vectors with length corresponding to the set value
	0 mm.	To display vectors of a fixed length
Turn ON/OFF the display of the targets table:		
ARPA\Target table view	<Enter>	Targets table containing parameters of the targets displayed by the NS, appears in the bottom part of the NS screen
After viewing the table, exit into the NS main menu	<Esc>	In this case the table remains on the screen
If necessary, close the table of targets	<Esc>	A window with the table is removed from the NS screen

3.5.3 Display of ARPA Cursor, ERBL and Screen

This kind of display can be provided by the NS depending on the type of interfaced ARPA. The cursor and ERBL cannot be displayed unless the connected ARPA has an output in accordance with IEC 1162-1 (see "Technical Reference") When BridgeMaster series ARPAs by Racal-Decca Marine are connected, provided the data exchange is in accordance with a special protocol (see "Technical Reference"), the following facilities become available"

- the screen displays a circle with numbered degrees corresponding to the visible ARPA screen;
- ERBL is displayed

1. Display of the ARPA cursor and/or ERBL:

1	2	3
ARPA\ARPA Info (or use Shift>+ <F11> hot keys)	ON	To display radar information

Turn on the display of cursor: ARPA\ARPA cursor	ON	The cursor is shown on the NS screen in the green color (to move the cursor use ARPA controls)
Turn on the display of ERBL: ARPA\ARPA ERBL	ON	The ERBL is shown on the NS screen in the green color (to move ERBL use ARPA controls)

2. Display of ARPA circle with numbered degrees:

1	2	3
ARPA\ARPA Info (or use Shift>+ <F11> hot keys)	ON	To display radar information
	<Ctrl>+ <R>	Use this hot key combination to turn ON/OFF the display of a circle with numbered degrees corresponding to ARPA screen

3.5.4 Saving Radar Targets' Tracks

This NS function archives the targets' tracks in day-by-day files. Regardless of this, such archiving is switched on automatically at the moment when CPA and TCPA values (simultaneously) are less than the respective settings for at least one of the targets (see 'Setting the Alarms in Work with ARPA').

For a compulsory recording of the radar targets' tracks (to make archives for the future viewing of the recorded navigational situation) use the following procedure:

1	2	3
ARPA\ARPA Info (or use <Shift>+ <F11> hot keys)	ON	To display radar information

ARPA\Recording	ON	To turn on the recording of tracks of all the targets displayed on the NS screen
After the required situation has been archived, turn off the recording		
ARPA\Recording	<Enter>	The 'Menu Area" displays a window for the input of system password
Enter the password	<Enter>	The function's indicator is automatically switched to OFF position

3.6 Trial Maneuver

3.6.1 Trial Maneuver for Steering to the Next Route Segment

This type of trial maneuver is recommended at the approach to the WP (at least 24 minutes in advance) when it is necessary to swing by the course of the next route leg In the process of such trial maneuver the navigator receives the following information

- point of taking the required course (if the ownship's COG vector does not cross the planned route leg which is scheduled to be steered as a result of the maneuver, a point on its continuation is indicated);
- time to sail to this point,
- alarm that a moment for performing the given maneuver has come,
- trial maneuver situation with regard to tracks of other vessels in the given point's vicinity (see 'Trial Maneuver for Avoiding Collision with Other Vessels').

The data required for the trial maneuver is entered in the maneuver parameter input window, which is displayed in the NS Menu Area (see 'Trial Maneuver for Avoiding Collision with Other Vessels').

To perform the aforementioned trial maneuver use the following procedure:

1	2	3
Ascertain that the sailing time to the next WP of the of the passage loaded in the Voyage Monitoring does not exceed 24 minutes:		(also see 'Loading of and Work with Route and Voyage Schedule in the Voyage Monitoring Mode")
CONFIG\Display (or press <Tab> hot key successively)	ROUTE	Display Route Mode is turned on in the NS Information Area, displaying data on the route
Check that the ownship model has been loaded in the function ARPA\Ship's model\List of models		The model should be created and loaded as described in "Utilities" document
Turn ON/OFF the inclusion of drift effect during the maneuver:		It is recommended that drift should be taken into account when the positioning system gives off steady drift values for the non-maneuvering vessel
ARPA\Ship's model\Trial line along	COG	To turn on the inclusion of drift effect
	HDG	Vessel's drift is not taken into account
ARPA\Trial maneuver (or press <F9> hot key)	<Enter>	The NS Menu Area displays a window for the maneuver parameter input, where in "HDG to steer" line the course to the next WP should be entered

In what follows, all the function given in column 1 belong to *ARPA\Trial maneuver* submenu and are arranged in the Maneuver Parameter Input Window (see 'Trial Maneuver for Avoiding Collision with Other Vessels'). Such functions are marked with "\\" and provided with a reference to the appropriate section of this window.

1	2	3
Set the time in minutes, which the length of the TML display will depend on, and which exceeds the time set in the Display Route Mode for sailing to the WP:		
\\ Trial line (in section 3)	From 2 to 24 min	The NS screen displays a TML of a set length, whose crossing point with the route leg is marked with the number of minutes required for sailing to this point
Set the maneuver delay time equal to the time in the vessel TML's crossing point with the route leg: \\ Man delay (in section 2)	From 0 to 24 min	
\\ Trial line (in section 2)	Drop	To fix the planned maneuver track: in this case the vessel's symbols is moving to the intended maneuver point, whilst the delay time is reduced
Select and fix the required track of the intended maneuver:		
\\ HDG to steer (in section 1)	From 0 to 360 degrees	To select the track change the direction of the line originating in the point which was fixed by setting the maneuver delay time
Select the track shape on the turning circle by setting the rudder angle: \\ Rudder angle (in section 1)	From 5 to 35 degrees	The shape of the turning circle is changing in accordance with the selected rudder angle value

Set the final time of the maneuver delay by selecting the maneuver start point reasoning from the considerations of safety: \\ Man delay (in section 2)	From 0 to 24 min	The selected track moves in the direction of the vessel's current course

After the intended maneuver track has been selected and fixed, the navigator has some time (delay time shown on the maneuver track) for preparations. 30 seconds before the start is due, the NS Information Area displays "MANEUVER" warning message advising that this is the moment of starting the selected maneuver.

After the maneuver is completed, exit from the trial maneuver mode as required:

ARPA\Cancel trial man.	<Enter>	

3.6.2 Trial Maneuver for Avoiding Collision with Other Vessels

When ARPA is connected to the NS, the navigator is provided with a facility to perform a trial maneuver for avoiding collision with other vessels. In this case the NS displays the following data:

1) For the ownship symbol:

- a dashed TML (true motion line), each of its dashes standing for a distance covered in one minute, and six-minute intervals being marked with a notch, whilst the maneuver delay time is shown with digits in the intended maneuver start point;
- the conjectured vessel track resulting from the maneuver shown in different colors depending on the availability of a dangerous approach to other vessels. In this case:

  - green segments show that no dangerous approach is expected;

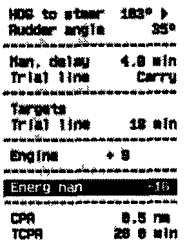
- yellow segments show that an approach is expected at a distance, which is less than twice the set CPA value (see 'Setting the Alarms in Work with ARPA');
- red segments show that an approach is expected at a distance, which is less that the set CPA value

- a small circle on the intended maneuver track (shown in the color of the track it is located on) indicates the place where steadying up should be started for steering to the designated course (in the course maneuver);
- a small magenta circle on the maneuver track which appears during the speed maneuver and indicates the place where the vessel's propulsion unit setting should be changed to the initial one

2) For ARPA acquired radar targets

- targets' expected true motion line (ETML) displayed in different colors depending on the availability of a dangerous approach to the ownship similar to the display of the ownship's TML described above, or
- targets' expected relative motion lines (ERML) in the magenta color, which, like the ownship's TMLs, are divided by notches into minute plots and 6-minute segments,
- apart from the fact that targets ETMLs are displayed in different colors, during the trial maneuvers symbols of such targets acquire additional marking according to their danger criterion - a slanted cross
  - if in the yellow color, indicates that the target's CPA and ONDA values are less than twice their set values;
  - if in the red color, indicates that the target's CPA and TCPA values are less than their set values.

The data required for the trial maneuver is entered in the WINDOW FOR THE MANEUVER PARAMETER INPUT, which appears in the NS Menu Area. This window consists of 6 sections, which contain function for the input of intended maneuver parameters.



These functions and procedure for the input of the intended maneuver parameters are described in Table 3.6-1.

Table 3.6-1

Section 1:

Function name	Possible positions of the function's indicator	Purpose	Procedure to set the required value in the indicator
1	2	3	4
HDG to steer	From 0 to 359 degrees	Selecting the intended maneuver track by setting the course in the trial course maneuver	Use the trackerball or <←><→> cursor control keys, press <Enter> to fix
Rudder angle	From 5 to 35 degrees (with 5 degree discretion)	Setting the rudder angle value to display the shape of the maneuver track on the turning circle	Use the trackerball or <↑><↓> arrow cursor control keys, press <Enter> to fix
	0 degrees	No trial maneuver performed	

Section 2:

1	2	3	4
Man. delay	From 0 to 24 min	Setting the maneuver delay time	Use the trackerball or <↑><↓> arrow cursor control keys, press <Enter> to fix
Trial line		Selecting the mode of displaying the selected maneuver track:	Use <Enter> to switch between the indicator positions
	Carry	For the track to move together with the vessel symbol	

	Drop	To fix the track, where after, with the maneuver delay time set, the vessel is moving to the intended maneuver start point, whilst the delay time (a digit shown in the maneuver start point) is turning to smaller values with 1-minute discretion	

Section 3:

1	2	3	4
Targets\Target trial line		Selecting the shape of displaying the pre-calculated targets' tracks:	Use <Enter> to switch between the indicator positions
	ABS	Display of ETML	
	REL	Display of ERML	
Targets\Hide trial lines		Turning on/off the display of targets' ETMLs or ERMLs during the trial maneuver:	Use <Enter> to switch between the indicator positions
	AUTO	To turn on the display of ETMLs or ERMLs only for the targets dangerous in the trial maneuver	
	SEL	To turn on the display of the pre-calculated tracks for all the targets except those turned off by the navigator via ON/OFF function which appears in this case (a line below)	To turn off the display of targets' ETMLs/ERMLs via ON/OFF function by pressing <Enter> and use the acquisition marker which will appear

Targets\Target simulator		(see 'Simulation Trial Maneuver')	
Trial line	From 2 to 24 min	Setting the length of the ownship's TML and targets' TMLs or RMLs	Use the trackerball of enter the required value via the keyboard, press <Enter> to fix; or
	0 min	No trial maneuver is performed	use <Ctrl>+ <PgUp> and <Ctrl>+ <PgDn> hot keys

Section 4:

1	2	3	4
Engine	The indicator contains	Setting parameters for the trial speed maneuver:	
	Propulsion unit setting	Setting of the vessel's propulsion unit which is intended to be used during the maneuver	Use the trackerball or <←><→> arrow cursor control keys, press <Enter> to fix
	Maneuver delay time - from 2 to 24 min	Time setting exceeding the ownship's TML length implies a complete change over to the propulsion unit setting in the process of performing the maneuver; time setting less than the TML length will only mean kind of stopping, i.e. the change over to the propulsion unit setting during the indicated period of time only	

Section 5:

1	2	3	4
Emerg. man	Propulsion unit settings'	Setting the propulsion unit operation of the trial "last moment" maneuver. Depending on the propulsor type the following can be set in the indicator:	Use the trackerball or <←><→> arrow cursor control keys, press <Enter> to fix
	From-10 to 0	propeller pitch values (for a variable pitch propeller)	
	From FULL AST to STOP	main engine setting (for a fixed pitch propeller)	

Section 6:

1	2	3	4
CPA and TCPA		For the display of previously set values only (see 'Setting the Alarms in Work with ARPA').	

To perform a trial maneuver for avoiding collision with other vessels use the following procedure:

1	2	3
ARPA\ARPA Info (or use Shift>+ <F11> hot keys)	ON	To display radar information: ARPA acquired targets are shown on the NS screen

Turn on the display of targets table as required: ARPA\Target table view	<Enter>	(see 'Work with Radar Targets') In the bottom part of the NS screen a targets table containing parameters of targets displayed by the NS, appears
Check that the ownship model has been loaded via function ARPA\Ship's model\ List of models		The model should be loaded as described in "Utilities" document
Turn ON/OFF the inclusion of drift effect during the maneuver: ARPA\Ship's model\ Trial line along	COG HDG	It is recommended that drift should be taken into account when the positioning system gives off steady drift values for a non-maneuvering vessel To turn on the inclusion of drift effect Vessel's drift is not taken into account
ARPA\Trial maneuver (or <F9> hot key)	<Enter>	The NS Menu Area displays a maneuver parameter input window (see above).

In what follows all the functions listed in column 1 refer to ARPA\Trial maneuver submenu and are displayed in the maneuver parameter input window. These functions are marked with "\\" and provided with a reference to the appropriate section of this window.

1	2	3
Set the length of TML display on the NS screen: \\ Trial line (in section 3)	From 2 to 24 min	To set the TML length for a more suitable display on the NS screen in the process of the trial maneuver

Turn on the display of TML: \\ HDG to steer (in section 1)	<Enter>	The NS screen displays TML of the set length, whilst the function's indicator in the window becomes active

Further navigator operations will depend on his/her selecting one of the following trial maneuver options:

- Course maneuver:

1	2	3
Use the trackerball to move the TML, select and fix the required option of a collision avoidance maneuver: \\ HDG to steer (in section 1)	<Enter>	The selected track is "attached" to the vessel symbol and is moving together with it
Select the track shape on the turning circle by setting the rudder angle: \\ Rudder angle (in section 1)	From 5 to 35 degrees	The shape of the turning circle changes with the selected rudder angle value

- Course maneuver with a change over to another setting off the propulsion unit operation:

1	2	3
Fix the display of TML: \\ HDG to steer (in section 1)	<Enter>	TML is "attached" to the vessel symbol and is moving together with it
Select and fix the required option of the collision avoidance maneuver by designating the appropriate setting of the propulsion unit operation during the maneuver:		

\\ Engine (in section 4)	<Enter>	In setting the maneuver time, it is necessary to select a value exceeding the ownship's TML length; the selected track will then be moving together with the vessel symbol

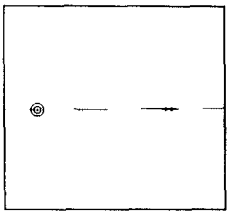
ATTENTION: If the speed becomes less than the critical speed, the vessel's track will be discontinued at this point.

❑ Speed maneuver performed by changing over to another propulsion unit setting for a short period of time ("slowing down"):

1	2	3
Fix the display of TML: \\ HDG to steer (in section 1)	<Enter>	TML is "attached" to the vessel symbol and is moving together with it
Select and fix the required option of the collision avoidance maneuver by designating the appropriate setting of the propulsion unit operation and maneuver time: \\ Engine (in section 4)	<Enter>	The designated maneuver time should correspond to the time interval within which the vessel will be sailing with the engine setting designated by this function; the selected track will then be moving together with the vessel symbol

- To perform a combined course/speed maneuver alternate the use of the aforementioned options.

- The "last moment" maneuver:



1	2	3
Fix the display of TML: \\ HDG to steer (in section 1)	<Enter>	TML is "attached" to the vessel symbol and is moving together with it
Designate the engine setting (or propeller pitch) required for the given trial maneuver: \\ Emerg. man (in section 5)	<Enter>	The NS screen displays two turning half circles (wheel hard a-board) and the vessel's stopway as a result of change over from the current propulsion unit setting to that set in the function indicator (see fig.)

After selecting the intended maneuver track you should use the following procedure:

1	2	3
Set the required maneuver delay time and fix the selected track: \\ Man delay (in section 2)	From 0, 5 to 24 min	The selected maneuver track travels in the direction of the current vessel's course at the distance corresponding to the set number of minutes
\\ Trial line (in section 2)	Drop	To fix the planned maneuver track: in this case the vessel symbol travels to the intended maneuver start point, whilst the delay time shows a decrease
Assess the collision avoi-dance situation with regard to radar targets		

o Select the type of pre-calculated targets' tracks:		
\Targets\Target trial line	ABS	To turn on the display of targets' ETMLs
o Turn off the display of selected targets' ETMLs or ERMLs as required:	REL	To turn on the display of targets' ERMLs
\Targets\Hide trial lines	SEL	"ON/OFF" function appears in Targets submenu
\Targets\ON/OFF	<Enter>	Acquisition marker appears (see 'Graphics Cursor')
Position the marker on the target whose ETML or ERML display should be turned off	<Enter>	The pre-calculated track of the selected target disappears from the NS screen
Exit from the mode	<Esc>	
o View the collision avoi-dance maneuver by changing the track length as required by using the hot keys:	<Ctrl>+ <PgUp>	To increase the length of ETML or ERML (Trial line length)
	<Ctrl>+ <PgDn>	To decrease the length of pre-calculated tracks
Use the above procedure as required for the input of other trial maneuver parameters		

After selecting and fixing the intended maneuver track the navigator has some time (the delay time indicated on the maneuver track) for preparations. 30 seconds before the start is due, the NS Information Area displays "MANEUVER" warning message advising that this is the moment of starting the selected maneuver.

After the maneuver is completed, exit from the trial maneuver mode as required:

ARPA\Cancel trial man.	<Enter>	

3.6.3 Simulation Trial Maneuvers

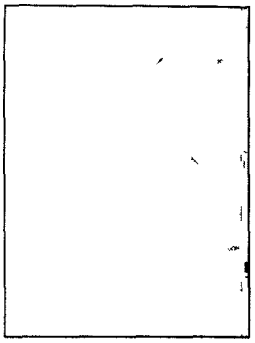
This NS capability cannot be implemented until ARPA is disconnected, and is used for the navigator training. With this in view, some targets (with "S" index) are created by using NS facilities; these targets' course and speed are set by the user:

1	2	3
Check that the ownship model has been loaded via function ARPA\Ship's mo-del\ List of models		The model should be loaded as described in "Utilities" document
ARPA\Trial maneuver (or press <F9> hot key)	<Enter>	The NS Menu Area displays a maneuver parameter input window (see "Trial Maneuver for Avoiding Collision with Other Vessels')
ARPA\Trial maneuver\ Targets\ Target simulator Position the marker in the point where a simulation target should be created Use the trackerball (or cursor control keys) to enter the course and speed for the given target Use the same procedure for entering all the other targets	<Enter> <Enter> <Enter>	Acquisition marker appears (see 'Graphics Cursor') A symbol of a radar target with "S" index appears in the selected point A newly created target's symbols acquires a motion vector, whilst the target parameters are included in the targets table (see 'Work with Radar Targets')

It then becomes possible to perform a simulation trial maneuver for avoiding collision with these targets, its procedure being similar to that described in section "Trial Maneuver for Avoiding Collision with Other Vessels".

3.7 Creating and Loading a Route Plan

3.7.1 Route Planning on the Electronic Chart



1	2	3
Unload a previously loaded route ROUTE\Unload route plan	<Enter>	(if any)
* Check that the ownship model has been loaded via function: ARPA\Ship's model\List of models		The model should be created and loaded as described in "Utilities" document
* Set the shape of the curvilinear track in steering from one route leg to another: ARPA\Trial maneuver\ Rudder angle	From 5 to 35 degrees 0 degrees	To set the rudder angle which is used for calculating the turning circle track on the given turn (see the drawing) Turning circle track is not calculated
ROUTE\WP graphic editor Position the cursor in the beginning of the planned route and set the required scale Position the cursor on the require point, or press <Tab> key to switch the cursor activity to the information window and enter the coordinates manually	<Enter> <+ > < - > <Enter>	A 'Graphics Cursor' appears (see Fig. 3–6) To increase scale by one point in its range of possible values To reduce scale by one point in its range of possible values To fix the route start point (as the cursor then moves from this point, it draws a thread of the planned route)

Move the cursor to the next WP And so on, until the route planning is completed (see Fig. 3–6)	<Enter>	To fix a planned route leg (blues colored dashed line)

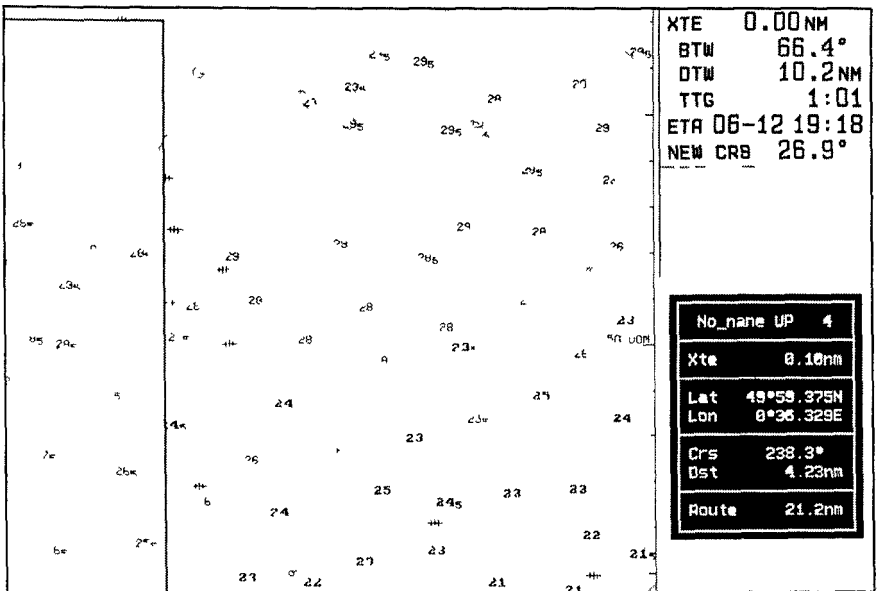


Fig. 3–6

Exit from the route planning mode	<Esc>	The Menu Area displays an information window containing the route name and data on the last entered WP
	<Esc>	To exit into ROUTE submenu
Save the route. ROUTE\Save	<Enter>	The 'Menu Area" displays an input window
Enter the route name (up to 8 characters without spaces or punctuation marks)	<Enter>	

Print out the route plan as required: ROUTE\Print	<Enter>	The route contained in the data input table is printed out
Unload a saved route plan from the NS as required: ROUTE\Unload route plan	<Enter>	To unload a saved route from RAM

Actions marked with* (asterisk) may be performed as required.

Note: The route plan can be saved at any stage of its preparation. For the further work on and editing of the route see 'Editing a Previously Created Route'.

3.7.2 Creating a Route Plan with a Check for the Presence of Dangers to Navigation

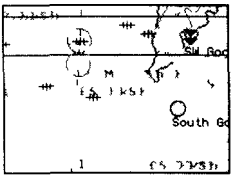
Checking of a planned route includes the monitoring of the vessel crossing, within the set XTE, the following objects classified as dangers to navigation:

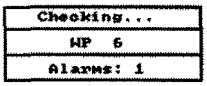
- safety contours;
- isolated dangers;
- guard zone limits on the user charts;
- limits of special purpose areas (see 'Alarm Messages on the Approach to the Special Purpose Areas').

Using either of the following procedures can perform such check:

1. Checking the route plan as it is being created:

1	2	3
Unload a previously loaded route: ROUTE\Unload route plan	<Enter>	(if any)
Set the parameters of and turn on the alarms for the Voyage Monitoring mode		(see 'Setting the Parameters for Monitoring Safety of Navigation' and 'Setting the Alarms in Voyage Monitoring Mode')





ROUTE\Check editor	ON	To turn to the mode of checking a created route with respect to dangers to navigation
ROUTE\WP graphic editor	<Enter>	A 'Graphics Cursor' appears
Position the cursor on the beginning of the planned route and set the required scale	<+ >	To increase the scale by one point in its range of possible values
	< - >	To reduce the scale
Position the cursor in the required point; or press <Tab> key to switch the cursor activity to the information window and enter the coordinates manually	<Enter>	To fix the route start point (as the cursor then moves from this point, it draws a thread of the planned route)
Move the cursor to the next WP	<Enter>	The 'Menu Area" displays an information window containing the number of the WP which is being checked and number of dangerous places identified on the relevant route leg (see fig.) If a danger to navigation is detected on the checked route leg, the Menu Area displays an information window identifying the nature of the danger, whilst on the chart such place is marked with a flashing cross within a circle (see fig.) If no danger is detected, a window appears (against a green background) informing that the check is complete (see fig.)
Assess the identified danger by setting an appropriate scale using	<Tab>	To load a chart which is a source of information on the danger, where the danger

<+ > and < - > hot keys; and		which caused an alarm to be generated will be shown within a circle
continue planning the route if the danger does not appear to be a serious one or is absent; or	y (yes) or <Enter>	The next window is displayed, indicating a danger (etc.) or (if there are no dangers) a window informing that the check of the route leg is completed
return to the previous checked WP if the iden-tified danger is assessed as a considerable one.	n (no) or <Esc>	A window is displayed with a request to confirm the inter-ruption of the check (see fig.) press "y" or <Enter> to confirm (see fig.)
Use the same procedure for entering the rest of the WPs		(see also 'Route Planning on the Electronic Chart')
Exit from the route planning mode	<Esc>	The Menu Area displays an information window containing the name of and data on the last entered WP
	<Esc>	To exit into ROUTE submenu
Save the route:		
ROUTE\Save	<Enter>	The 'Menu Area" displays a route name input window
Enter the route name (up to 8 characters without spaces or	<Enter>	

2. Checking a previously created and saved route plan:

1	2	3
Load the route:		
ROUTE\Load route plan	<Enter>	The 'Menu Area" displays a list of stored routes arranged in the alphabetical order
Position the cursor on the required route name	<Enter>	To load a route selected for checking in the NS

Set the parameters of and turn on the alarms for the Voyage Monitoring mode		(see 'Setting the Parameters for Monitoring Safety of Navigation' and 'Setting the Alarms in Voyage Monitoring Mode')
Turn on the route check mode: ROUTE\Check route plan	<Enter>	The Menu Area displays an information window containing the number of the WP which is being checked and number of dangerous places identified on the relevant route leg (see fig. above) If a danger to navigation is detected on the checked route leg, the Menu Area displays an information window identifying the nature of the danger, whilst on the chart such place is marked with a flashing cross within a circle If no danger is detected, a window appears (against a green background) informing advising that the check is completed
Assess each identified danger by setting an appropriate scale using <+ > and < - > hot keys; and	<Tab>	To load a chart which is a source of information on the danger where the danger which caused an alarm to be generated will be shown within a circle

continue checking the route if the danger does not appear to be a serious one; or	y (yes) or <Enter>	To next window is displayed indicating a danger (etc.) or (if there are no dangers) a window informing that the check of the route leg is complete
finish the check for the immediate Editing of a Previously Created Route if the identified danger is assessed as a considerable one.	n (no) or <Esc>	A window is displayed with a request to confirm the interruption of the check; press "y" or <Enter> to confirm

3.7.3 Transferring a Planned Route from the Paper Chart

This procedure for route planning is used independent of or to supplement the creating of a route plan on the electronic chart by the digital input of the following planned route data in the ROUTE DATA INPUT TABLE:

BIL-FLSG	0	1	2	3	4	5
Name						
Lat	43°22.757N	48°23.247N	48°32.558N	48°49.810N	50°30.862N	50°42.812N
Lon	3°04.910W	5°22.564W	5°14.172W	2°50.557W	0°59.423E	1°21.331E
XTE		0.10nm	0.10nm	0.10nm	0.10nm	0.10nm
RL/GC		RL	RL	RL	RL	RL
Course		342.3°	30.9°	50.8°	74.4°	49.3°
Distance		315.4nm	10.8nm	121.1nm	152.9nm	18.3nm
Sum distance		315.4nm	326.2nm	447.3nm	600.2nm	618.6nm

- Name - WP name (up to 8 characters);
- Lat - latitude;
- Lon - longitude;
- XTE - value of admissible cross track error in miles on the given
- course, monitored by the appropriate alarm (see 'Setting the Alarms in Voyage Monitoring Mode');
- RL/GC - Rhumb Line/Great Circle - form of the plotted route segment.
- The following values are calculated from this data input:
- Course - direction to the given WP from the previous one. When the Great Circle is used the initial course is a GC course (calculated from the WP coordinates);

- Distance - distance between the WPs (calculated from the WP coordinates);
- Sum distance - total distance from the zero (start) point to the given WP.

Enter and edit values in the table group by group after activating the required cell. To do this use the trackerball (or the keyboard) to position the cursor on this cell, press <Enter>, enter the required value and confirm the input by pressing <Enter>.

1. To create a route plan by entering the above values obtained from the paper chart use the following procedure:

1	2	3
Unload a previously loaded route: ROUTE\Unload route plan	<Enter>	(if any)
*Ascertain that the mathe-matical ship model has been loaded: ARPA\Ship's model\List of models	<Enter>	Mathematical ship model is created by «Model» utility (see document "Utilities")
* Set the curvilinear track shape in steering from one route leg to another: ARPA\Trial maneuver\Rudder angle	From 5 to 35 degrees 0 degrees	To set the rudder angle which is used for calculating such trajectory The trajectory is not calculated
ROUTE\Route plan table Enter the latitude and longitude values for the route's zero WP group by group of figures, its name and fix the WP by activating its number in the input table	<Enter> <Enter>	A Route Data Input Table is displayed in the bottom part of the NS screen (see above) The WP is plotted on the chart matching its coordinates, whilst the next WP with the previous WP's parameters appears in the table

Use a similar procedure for entering the required values for each WP by first activating its number in the next cell and then the appropriate lines	<Enter> after each input	
After the input of the last WP exit into ROUTE	<Esc>	The data input table disappears from the NS screen
Save the route plan: ROUTE\Save Enter the route name (up to 8 characters without spaces or punctuation marks)	<Enter> <Enter>	The "Menu Area" displays a route name input window
Print out a planned route as required ROUTE\Print	<Enter>	To print out a planned route (the one in the data input table)
Unload the saved route from the NS as required: ROUTE\Unload route plan	<Enter>	The saved route is unloaded from RAM

Actions marked with* (asterisk) may be performed as required.

Notes:

1) A thus created route can be checked concurrently with its planning (see 'Creating a Route Plan with a Check for the presence of navigational dangers', item 1), or after it is completed (item 2 of the same chapter).

2) The route plan can be saved at any stage of its preparation. For a further work on and editing of the route see 'Editing a Previously Created Route'

2. YEOMAN digitizer can also be used for transferring a route plan from the paper chart:

1	2	3
Check that YEOMAN digitizer is connected to the NS and is functioning normally		(see "Technical Reference" and section 'Running the NS and turning It Off)
Reference YEOMAN digitizer to the paper chart, switch the digitizer to WayPoint mode (WP), follow the procedures for the WP input detailed in 'Creating a Route Plan on the Electronic Charts' using YEOMAN unit in the place of a trackerball		(see the relevant section in "Technical Reference" document)

ATTENTION! Paper charts may use datum other than WGS-84. If WP coordinates entered in the NS, are taken from paper charts, it is necessary to take into account WGS-84 offset which is provided in the general information on the chart (see 'Obtaining Information on the Electronic Chart').

3.7.4 Editing a Previously Created Route

A previously created route plan can be edited graphically and in a tabular form.

1. For the graphic editing of a previously created route plan use the following procedure:

1	2	3
Load the route:		
ROUTE\Load route plan	<Enter>	The 'Menu Area" displays a list of stored routes arranged in the alphabetical order
Position the cursor on the required route name	<Enter>	To load a route, selected for editing in the NS

ROUTE\WP graphic editor	<Enter>	Acquisition marker appears (see 'Graphics Cursor'), whilst the Menu Area displays an information window containing the route name and marker position.

Now that the graphic editing mode is switched on you can make the following changes in the loaded route plan:

- move a WP and fix it in a new position

1	2	3
Position the acquisition marker on the WP which should be moved	<Enter>	The marker turns to the "Graphics Cursor', and the Menu Area displays an information window containing the route name and edited WP parameters corresponding to the data from the Route Data Input Table (see 'Transferring a Planned Route from the Paper Chart')
Move the cursor with an "attached" WP to the required position; or use <Tab> key to switch the cursor activity to the information window and enter the coordinates manually	<Enter>	To fix the WP's new position and return to the graphic editing mode

- Adding a new WP in some route leg:

1	2	3
Position the acquisition marker on the route leg where a WP is required to be added	<Enter>	Acquisition marker turns to the "Graphics Cursor', and the Menu Area displays an information window containing the route name and parameters of the WP which is being added, corresponding to the data from the route data input window

Move the cursor with an "attached" WP to the required position (see Fig. 3–7), or	<Enter>	To fix the WP's new position (WPs are re-numbered automatically) and return to the graphic editing mode
use <Tab> key to switch the cursor activity to the information window and enter the coordinates manually		

- Deleting a WP:

1	2	3
Position the acquisition marker on the WP which should be deleted	<Delete>	The acquired WP is deleted (WP's are re-numbered automatically)

or

1	2	3
Position the acquisition marker on the WP which should be deleted	<Enter>	Acquisition marker turns to the 'Graphics Cursor', and the Menu Area displays an information window containing the route name and parameters of the WP which is being deleted, corresponding to the data from the route data input window
	<Esc>	To delete the WP (WPs are re-numbered automatically) and return to the graphic editor mode (see Fig. 3–8)

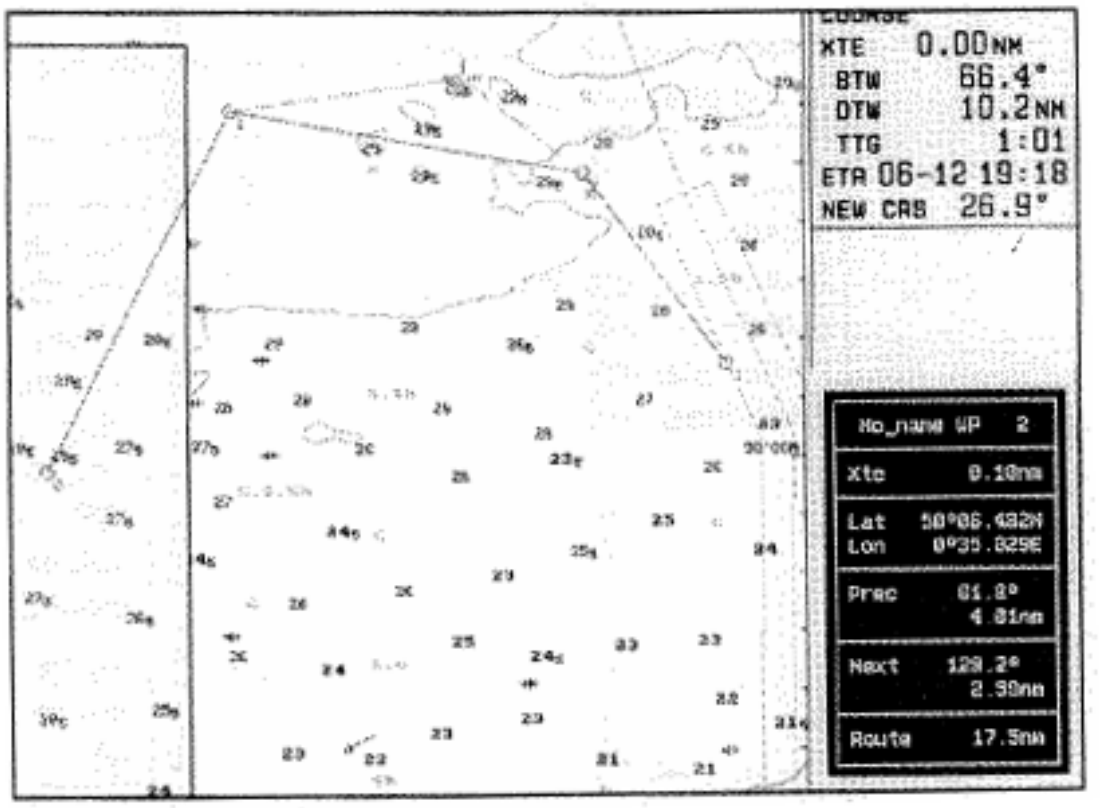

XTE 0.00NM
BTW 66.4°
DTW 10.2NM
TTG 1:01
ETA 06-12 19:18
NEW CRS 26.9°
No_name WP 2
Xte 0.10nm
Lat 58°06.432N
Lon 0°35.829E
Prec 61.8°
4.81nm
Next 129.2°
2.99nm
Route 17.5nm

Fig. 3–7

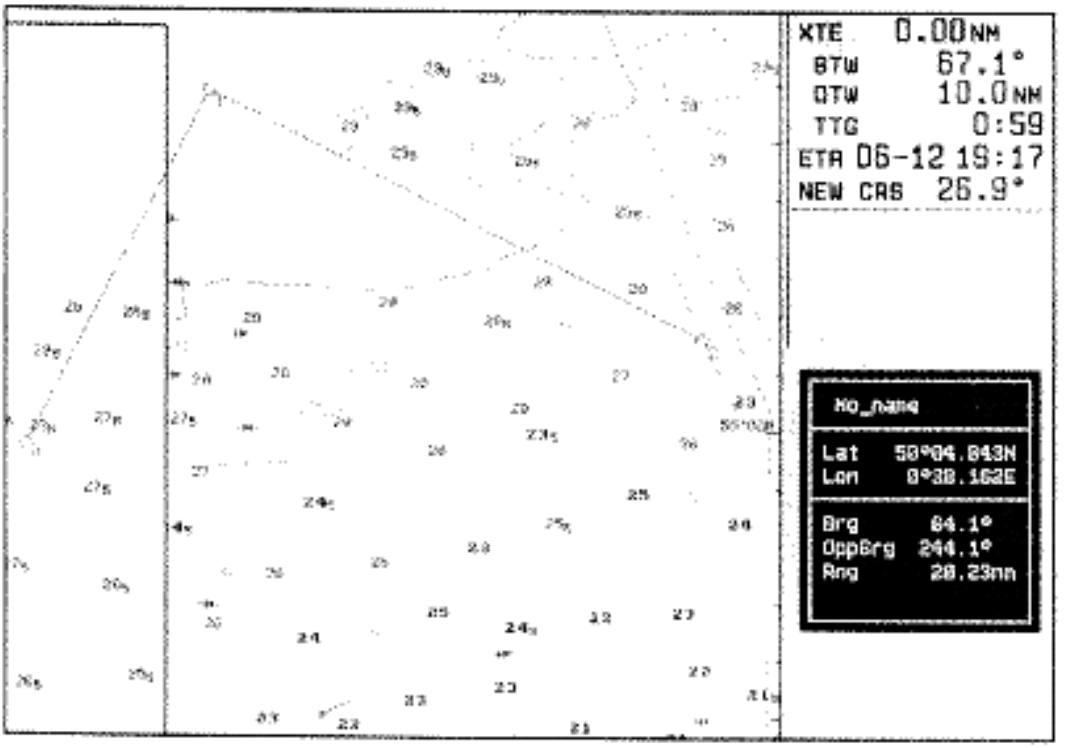

XTE 0.00NM
BTW 67.1°
DTW 10.0NM
TTG 0:59
ETA 06-12 19:17
NEW CRS 26.9°
No_name
Lat 58°04.843N
Lon 0°38.162E
Brg 64.1°
OppBrg 244.1°
Rng 28.23nm

Fig. 3–8

- Proceeding with the WP input (from the starting or the last entered point in the planned route):

Position the acquisition marker on the last entered (starting) WP which the route planning should be continued from	<Enter>	Acquisition marker turns to the "Graphics Cursor', and the Menu Area displays an information window containing the route name and parameters of the acquired WP, corresponding to the values from the route data input table
	<Enter>	To fix the acquired WP (WPs are re-numbered automatically)
Move the cursor to the next WP	<Enter>	For proceeding with route planning see 'Route Planning on the electronic Chart'

- Changing the form of a planned route leg (Rhumb Line or Great Circle):

Position the acquisition marker on the route leg which is required to be changed;	<Insert>	A Rhumb Line segment turns to a Great Circle segment (and the other way round)
or		
position the marker on the WP	<Insert>	Both route segment are changing: before and after the WP (see Fig. 3–9)

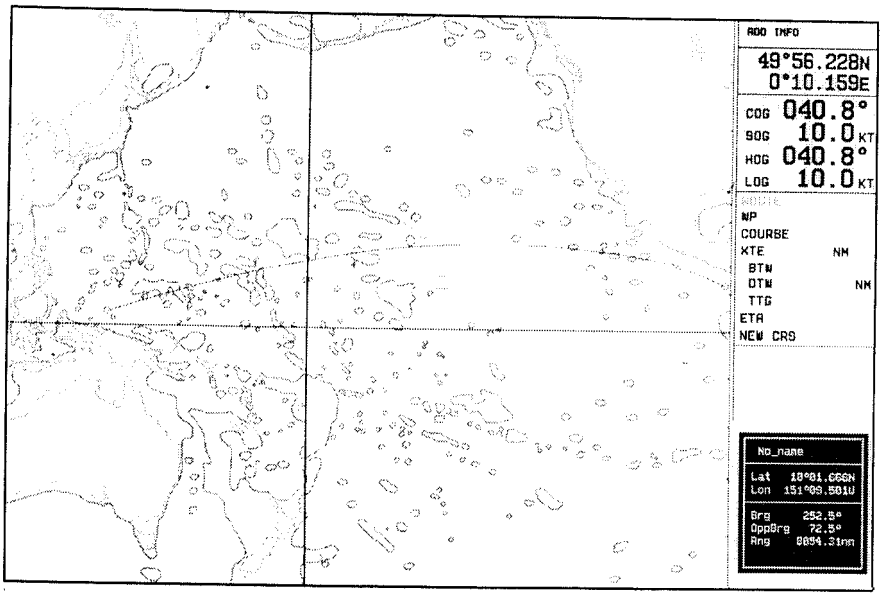


Fig. 3–9

It is then necessary to save an edited route:

1	2	3
Exit from the Editing mode	<Esc>	To exit into ROUTE submenu
ROUTE\Save	<Enter>	The 'Menu Area" displays a route input window containing the initial route name
Enter a new route name (up to 8 characters without spaces or punctuation marks)	<Enter>	

2. For editing a planned route via the route data input table use the procedure described in chapter 'Transferring a Planned Route from the Paper Chart'. For an easier movement within the table you can also use the following keys:

<PgUp>	**- to move 10 columns to the left**
<PgDown>	**- to move 10 columns to the right**
<Home>	**- to move to the beginning of the route**
<End>	**- to move to the end of the route**

1	2	3
Load the route:		
ROUTE\Load route plan	<Enter>	The "Menu Area" displays a list of saved routes arranged in the alphabetical order
Position the cursor on the required route name	<Enter>	To load the route selected for editing in the NS
ROUTE\Route plan table	<Enter>	The bottom part of the NS screen displays a Route Data Input Table (see 'Transferring a Planned Route from the Paper Chart')

The following changes can be made in this Editing mode.

- Adding a WP:

1	2	3
Position the cursor on the previous WP Enter the required parameters for a new WP	<Insert> or <Enter>	The column where the cursor is placed, is duplicated (see 'Transferring a Planned Route from the Paper Chart')

- Deleting a WP:

1	2	3
Position the cursor on the WP which is required to be deleted	<Delete>	A column where the cursor is positioned is deleted

- To edit WP parameters follow the procedure similar to that used for their initial input (see 'Transferring a Planned Route from the Paper Chart').

It is then necessary to save the edited route:

1	2	3
Exit from the Editing mode	<Esc>	To exit into ROUTE submenu
ROUTE\Save	<Enter>	The Menu Area displays a route input window containing the initial route name
Enter a new route name (up to 8 characters without spaces or punctuation marks)	<Enter>	

Besides the following additional editing capabilities are implemented in the NS:

3. Automatic re-calculations of a planned route and re-numbering of WPs for a reciprocal route. The use of this NS function saves time in planning a reciprocal route (unless the route passes though the traffic separation schemes):

1	2	3
Load the route:		
ROUTE\Load route plan	<Enter>	The "Menu Area" displays a list of saved routes arranged in the alphabetical order
Position the cursor on the required route name	<Enter>	To load the route selected for editing in the NS
ROUTE\Make reciprocal route	<Enter>	The route is re-calculated and its WPs re-numbered
Save the edited route: ROUTE\Save	<Enter>	The Menu Area displays a route input window containing the initial route name
Enter a new route name (up to 8 characters without spaces or punctuation marks)	<Enter>	

4. Automatic combining of a loaded planned route with any other previously created and saved route:

1	2	3
Load the route:		
ROUTE\Load route plan	<Enter>	The 'Menu Area" displays a list of saved routes arranged in the alphabetical order
Position the cursor on the required route name	<Enter>	To load the route selected for editing in the NS
ROUTE\Link routes	<Enter>	To display the rest of all the sto-re route except the loaded one
Position the cursor on the route which should be connected to the loaded one	<Enter>	The last WP of the loaded route is connected to the first WP of the route plan selected from the list

Save the edited route: ROUTE\Save	<Enter>	The Menu Area displays a route input window containing the initial route name
Enter a new route name (up to 8 characters without spaces or punctuation marks)	<Enter>	

ATTENTION: When any changes are made in the route name or geometry, the voyage schedule (see 'Creating a Schedule of the Vessel's Motion along the Route') created for such route is considered to be invalid and is deleted.

3.7.5 Creating a Schedule of the Vessel's Motion along the Route

This NS function is designed for drawing a schedule of the vessel's motion along the route. Such schedule is formed in the process of calculating the time of proceeding along the route, from the motion parameters, which are set by the navigator. Several schedules can be drawn for a single route. To delete an unnecessary voyage schedule use *TASK\VPLAN\Delete voyage* function.

The digital input of parameters required for calculating the schedule is made in the VOYAGE SCHEDULE TABLE, which consists of three sections and additional information lines (the table columns are numbered in accordance with the WP numbers). The name of the route, which the schedule is made for, is specified in the top left cell of the table.

Section 1 The data in this section contains information on the route's WPs, which cannot be edited, and which is automatically transferred from the route data input table (see "Transferring a Planned Route from the Paper Chart') during the loading of the route selected for drawing up the schedule for:

- Name - WP name;
- Lat and Lon - latitude and longitude;
- Distance - distance between the previous and current WPs.

Additional information line includes:

- summary information on the route (TOTAL>)
  - ⌦ WP - number of WPs;
  - ⌦ Distance - total route length;
- information on the same parameters on the part of the route selected for calculations (SELECT>).

Section 2 The section is designed for input of the following parameters of proceeding along the route:

- Time Zone (in hours and minutes with the indication of hemisphere) - local time zone for each WP;
- ETA (date and time) - estimated time of arrival in the set WP provided the current speed (SOG) remains unchanged;
- Stay (number of full days, hours and minutes) - time of stay in the WP;
- ETD (date and time) - time of departure;
- Log Speed (in knots) - vessel's speed.

Section 3 This section displays the calculations result:

- ETA;
- ETD;
- TTG - time enroute between the WPs;
- Current - time lost (saved) due to the tidal and surface current effect,
- LogSpeed;

Summary information line contains the following data:

⇒ voyage duration (TIME>);

⇒ summary duration of stays (STAY>);

⇒ effect of currents (CURRENT>).

To view the table and move the cursor within it uses the keyboard (arrow keys, <Home>, <End>, <PgUp>, <PgDn>) or the trackerball. To exit from the table into the menu use <Esc> key or press the right trackerball button. To remove the table from the screen press <Esc> when the cursor is in the NS main menu.

To activate the WPs for the input of parameters of proceeding along the route, press <Enter> or <Insert> on the keyboard (or the left button of the trackerball). A second press on <Enter> with the cursor in this position will unselect the WP and exclude it from the schedule

calculations (in this case "gaps" between the start and end points are impermissible).

To create a schedule of proceeding along the route use the following procedure:

1	2	3
* TASK\CURRENT\Load (Tidal currents)	<Enter>	To load the database on tidal currents in the NS
* TASK\CURRENT\Load (Surface currents)	<Enter>	To load the database on surface currents in the NS
TASK\VPLAN	<Enter>	The bottom part of the NS screen displays a voyage schedule table, whilst the Menu Area displays VPLAN function submenu
Load the route selected for drawing up the schedule:		
TASK\VPLAN\Choose route	<Enter>	To display the list of stored routes arranged in the alphabetical order
Position the cursor on the selected route	<Enter>	In section 1 of the voyage schedule table data on the WPs and the route name appear
TASK\VPLAN\Voyage plan table	<Enter>	A cursor appears in the table
Position the cursor in the cell with the number of the selected start WP	<Enter> or <Insert>	The column of the corresponding WP is activated for the input of parameters of proceeding along the route: the cell containing the number is filled with the brown color, a dash appears in ETD line
Position the cursor on Time Zone line in the start WP column	<Enter>	The line is activated (turns gray), a cursor appears in the line

Enter the time shift relative to GMT with the indication of time shift direction (E or W)	<Enter>	Alphanumeric input is possible in the cursor position only
Activate the appropriate line, then enter ETD	<Enter>	In the activated line the current data and time are set by default

At this stage there are two ways to continue drawing up the voyage schedule.

- By the preset ETA in the end WP of the selected route segment:

Position the cursor in the cell with the number of the selected end WP in the selected segment of the planned route	<Enter> or <Insert>	The WP column is activated (the cell containing the number is filled with the brown color); dashes appear in ETA and Log Speed lines
Activate the appropriate lines and enter Time Zone and ETA	<Enter>	Input of values is similar to the input of Time Zone and ETD for the start WP (see above)
If necessary enter the data on the passage of the intermediate WPs by activating the table cells with their numbers		In the lines of each interme-diate table column where the data input is permitted dashes appear when the cell with WP number activated

- By the preset speed:

Position the cursor suc-cessively in the cell with the number of each following WP of the planned route	<Enter> or <Insert>	The WP column is activated the cell containing the number is filled with the brown color); dashes appear in ETA and Log Speed
Activate the appropriate lines and enter Time Zone and Log Speed for each route leg	<Enter>	The input of values is similar to the input of Time Zone and ETD for the start WP (see above)
If necessary enter the data on the passage of the intermediate WPs by activating the table cells with their numbers		In the lines of each intermediate table column where the data input is permitted dashes appear when the cell with WP number activated

The final stage of drawing up the schedule includes the check of entered data, calculations and saving of a newly drawn schedule:

Exit into VPLAN function submenu	<Esc>	
Turn on the mode of checking all the entered data:		
TASK\VPLAN\Check table	<Enter>	If no incorrect data is identified, a green window with "Calculation ENABLE" message is displayed; if the data input is incorrect, the bottom part of the NS screen displays an orange colored window with information on the detected errors
Edit the incorrectly entered data as required		(see 'Editing a Previously Created Schedule')
* TASK\VPLAN\Current	ON	To turn on the inclusion of currents effect
Turn on the schedule calculations:		
TASK\VPLAN\Calculation	<Enter>	A progress indicator appear in the Menu Area (when the effect of currents is taken into account); when these calculations are completed, section 3 of the table and the summary information line display the results
Save the created schedule:		
TASK\VPLAN\Save voyage	<Enter>	The Menu Area displays a window for the input of voyage schedule name
Enter the name (up to 17 characters without spaces of punctuation marks)	<Enter>	The bottom right corner of the table displays the entered description of the voyage schedule

Print out the schedule as required: TASK\VPLAN\Print table	<Enter>	
Unload the saved schedule from the NS as required: TASK\VPLAN\Unload voyage	<Enter>	

Actions marked with* (asterisk) are performed at the user's option to take the effect of currents into account. Taking the effect of currents into account increases the calculation time, it is, therefore, recommended that calculations without currents should be made as tentative calculations for a long route (especially for a route containing Great Circle segments).

3.7.6 Editing a Previously Created Schedule

With the change in parameter values entered in the voyage schedule table (see 'Creating a Schedule of the Vessel's Motion along the Route') it becomes necessary to edit a previously created schedule of proceeding along a certain route:

1	2	3
TASK\VPLAN	<Enter>	The bottom part of the NS screen displays a voyage schedule table, whilst the Menu Area displays VPLAN function submenu
Load the schedule which is required to be edited:		
TASK\VPLAN\Choose route	<Enter>	The 'Menu Area" displays a list of stored routes arranged in the alphabetical order
Position the cursor on the route whose schedule should be edited	<Enter>	In section 1 of the table, WP data and the name of the route appear
TASK\VPLAN\Load voyage	<Enter>	The Menu Area displays a list of names of saved schedules arranged in the alphabetical order

Position the cursor on the required schedule name	<Enter>	Section 3 of the table displays parameters of proceeding along the route which were used for creating the schedule

At this stage there are two possible ways of editing the voyage schedule.

1. By resetting the entered data and calculation results of the initial schedule and drawing up a new schedule (using the procedure described in chapter "Creating a Schedule of the Vessel's Motion along the Route'):

TASK\VPLAN\Clear table	<Enter>	The data in sections 3 and 4 of the voyage schedule table is deleted

2. By editing the initial schedule:

TASK\VPLAN\Voyage plan table	<Enter>	A cursor appears in the table
Highlight the route start WP for a new schedule by positioning the cursor on the cell with its number	<Enter> or <Insert>	The respective table column is activated for the input of parameters of proceeding along the route: the cell containing the number is filled with the brown color, and a dash appears in ETD line
Position the cursor on ETD line in the initial WP column	<Enter	The line is activated (turns grey), a cursor appears in it
Activate the appropriate line and enter ETD value	<Enter>	Alphanumeric input is possible in the cursor position only
Position the cursor successively in the cell with the number of each following WP of the planned route	<Enter> or <Insert>	The WP column is activated: the cell containing the number is filled with the brown color, and dashes appear in the lines where parameters input is permitted
Activate the appropriate lines and enter new values of the required parameters	<Enter>	The input of values is similar to the ETD input for the start WP (see above)

Delete unnecessary data by positioning the cursor on the items	<Delete>	
Exclude from calculations those WPs which are not required for drawing up a new schedule (if they are selected) by positioning the cursor in cells with their numbers	<Enter> or <Insert>	The respective column is unselected: the brown color in the cell with the number and the previously entered data disappear
Exit into VPLAN function submenu	<Esc>	
Turn on the check of all the entered data: TASK\VPLAN\Check table; and Correct the erroneous data input as required	<Enter>	(see "Creating a Schedule of the Vessel's Motion along the Route')
Turn on the schedule calculations: TASK\VPLAN\Calculation	<Enter>	Section 3 of the Voyage Schedule Table displays the results of calculations (see 'Creating a Schedule of the Vessel's Motion along the Route')
Reset the results of calculations (when data correction is required): TASK\VPLAN\Remove result Edit the values and turn on calculations again	<Enter>	Section 3 and summary information line in the table are cleared of calculation results

Save the created schedule:		
TASK\VPLAN\Save voyage	<Enter>	The Menu Area displays a window for the input of the schedule name, containing the initial schedule name
Enter a new schedule name (up to 17 characters without spaces or punctu-ation marks)	<Enter>	The bottom right corner displays the entered schedule description
Print out the schedule as required: TASK\VPLAN\Print table	<Enter>	
Unload the schedule as required: TASK\VPLAN\Unload voyage	<Enter>	

ATTENTION: When any changes are made in the route name or geometry, its associated voyage schedules are considered to be invalid and are deleted.

3.7.7 Loading of and Work with a Route and Voyage Schedule in the Voyage Monitoring Mode

To turn on calculations of the vessel's current position relative to the planned route, when in the Voyage Monitoring Mode, load the required route and set the display of data on the vessel's position on the route:

1	2	3
Load the route selected for the Voyage Monitoring Mode:		
ROUTE\Load route	<Enter>	To display a list of stored routes arranged in the alphabetical order
Position the cursor on the route required to be loaded	<Enter>	The previously loaded route is automatically unloaded

Load the voyage schedule selected for this route:		
TASK\VPLAN	<Enter>	To display a Voyage Schedule Table (see 'Creating a Schedule of the Vessel's Motion along the Route')
TASK\VPLAN\Choose route	<Enter>	To display the list of the same routes
Position the cursor on the route loaded for the Voyage Monitoring Mode	<Enter>	Route data appears in the table
TASK\VPLAN\Load voyage	<Enter>	To display a list of saved schedules for the given route arranged in the alphabetical order
Position the cursor on the voyage schedule required to be loaded	<Enter>	The selected schedule appear in the voyage schedule table
Exit into the main menu	<Esc>	
Turn off the display of the voyage schedule table	<Esc>	
Turn on the display of data on the route, or monitoring of the voyage schedule fulfillment respectively:		
CONFIG\Display;	ROUTE	Display Route Mode is turned on in the 'NS Information Area"
CONFIG\Display; (or press <Tab> hot key successively) Turn on the mode for the automatic change of WPs:	PILOT	To turn on Display Pilot Mode
ROUTE\Select next WP	AUTO	
* Set the advance distance for the change of the current WP:		

ROUTE\Arrival circle	From 0. 01 to 9. 99 miles 0	To set the range at which the current WP, with regard to which all the calculations are made, will be replaced with the next one The WP (displayed in the Display Route Mode) will not be changed until it has been passed
* Turn on the mode for the manual WP input: ROUTE\Select next WP ROUTE\Enter next WP	MAN Required WP number	ROUTE \Enter next WP function indicator appears In Display Route Mode, the 'NS Information Area" displays the numbers of the entered WP (in the orange color) and the data on the vessel's position on the route calculated with regard to this WP
* TASK\VPLAN\Unload voyage	<Enter>	To turn off the monitoring of Voyage schedule fulfillment
* ROUTE\Unload route	<Enter>	To turn off the calculations of the vessel's current position with regard to the route plan

Actions marked with* (asterisk) may be performed as required.

ATTENTION! If the route data is not displayed in the NS Information Area, the route should be unloaded and then loaded again.

3.7.8 Alarm Settings in Sailing along the Route

For the navigator to receive visual and audible notification that the vessel has sailed beyond the set limits, when the vessel's current position relative to the route plan is calculated in the Voyage Monitoring mode', indicators of the following *ALARM* submenu functions should be switched to ON position or set to a required value (OFF or 0 positions imply that there is no tracking of the respective criteria):

1	2	3
ALARM\Off route	ON	To switch on triggering of an alarm as the vessel is sailing beyond the route after passing the last WP
ALARM\WPT	From 1 to 99 min	To set an advance time for triggering of an alarm as the vessel is approaching a WP
ALARM\Course	From 0. 1 to 90 degrees	To set a current course's (COG) deviation from the route plan; when this is exceeded the alarm will be triggered off
ALARM\XTE	ON	To switch on triggering of an alarm as the vessel exceeds the XTE set in the route data input table (see "Transferring a Route from the Paper Chart') for the specific route segment
ALARM\Schedule control	From 1 to 900 min	To set the time of deviation from the route schedule: when this is exceeded the alarm will be triggered off

Note: Alarm messages displayed by the NS are listed in chapter 'Alarm messages and Recommended Actions'.

3.7.9 Networking Information on the Created Routes

This capability appears when the NS is operating within a network. This mode of the NS operation is set via "SYSTEM CONFIGURATION" utility (see "Technical Reference" and "Utilities" documents).
In this case "Networking" section containing a single "Equalize data" command appears in ROUTE submenu of the "slave" stations main menu. When this function is operating, the collection of routes in this station is compared to the collection of routes in the master station, whereupon certain files available in one of the stations are duplicated in the other one. In this case, out of several routes with the same name, the most recently modified file is selected and duplicated in both stations.

To "equalize" the data use the following procedure:

1	2	3
ROUTE\Equalize data	<Enter>	"UP-ING" indicator (start of operation) appears in this function's line; after the duplicating procedure has been completed, "DONE" message is displayed.

3.8 Manual Updating and Work with the User Charts

3.8.1 Making Manual Updates

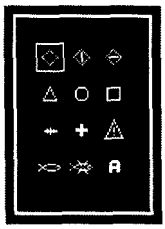
For maintaining the up-to-date status of the chart collection the NS has a facility for making manual updates from the official correction documents and other sources of correction information.
Updating is made by means of a special graphic editor capable of creating and editing objects on the active user chart (see 'Creating User Charts') whose display is superimposed on the electronic chart without changing the latter.
It is recommended, for the convenience sake, that updates should be made in the charts covering an individual navigation area. When saving a thus created chart, its purpose and a shortened name of the area should be reflected in the name (e. g., **Corr_Blt** stands for a user chart with updating for the Baltic Sea area).
To update electronic charts manually from a published correction document use the following procedure:

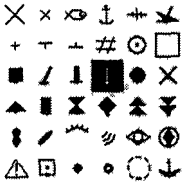
1	2	3
Load the electronic chart which should be updated		(see "Loading Charts Required by the User', item 2)
Load the user chart with corrections for the required navigation area (if already available):		(if the user chart is 'being newly created, see "Creating User Charts')

ADD INF\User chart list	<Enter>	To display a list of user charts arranged in the alphabetical order
Position the cursor on the required chart	<Enter>	The 'NS Information Area" displays the name of the loaded user chart
ADD INF\Color	OFF	To allow the orange color only for plotting the correction objects

Select the required updating option and turn on the graphic editor mode

- To plot an object on the chart:





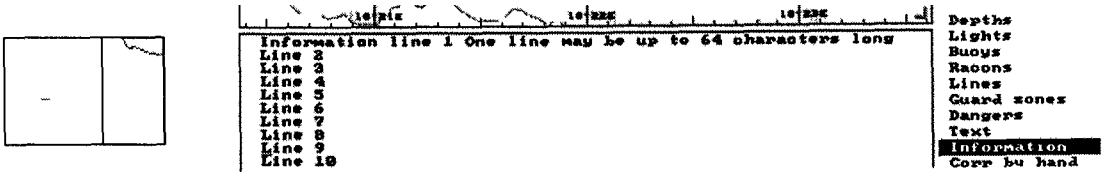
1	2	3
• Navigational symbols:		
ADD INF\Graphic editor\ Add a new object\ Symbols (External Symbols)	<Enter>	The 'Menu Area" displays a symbol selection window (see fig)
Position the cursor on the required symbol	<Enter>	A 'Graphics Cursor' appears
Position the cursor in the point where the navigational symbol is required to be plotted; or use <Tab> key to switch the cursor activity over to the information window and enter the coordinates manually	<Enter>	The added navigational symbol appears in the selected point on the NS screen
If another symbol is required to be added, move the cursor and repeat the above procedure		After each symbol input the graphic editor mode remains ON
Exit from the graphic editor mode	<Esc>	Exit is possible at any stage of editing
• Depths:		
ADD INF\Graphic editor\ Add a new object\ Depths	<Enter>	A 'Graphics Cursor' appears

Position the cursor in the point where the sounding is required to be specified; or use <Tab> key to switch the cursor activity over to the information window and enter the coordinates manually	<Enter>	The "Menu Area" displays a depth input window
Enter the depth value	From 0 to 999 m	The added sounding appears in the selected point on the NS screen
If another depth is required to be plotted, move the cursor and repeat the above procedure		After each sounding input the graphic editor mode remains ON
Exit from the graphic editor mode	<Esc>	Exit is possible at any stage of editing
• Lights, buoys, transponder beacons:		
ADD INF\Graphic editor\ Add a new object\ Lights (Buoys, Racons)	<Enter>	A 'Graphics Cursor' appears
Position the cursor in the point where a certain symbol is required to be plotted; or use <Tab> key to switch the cursor activity over to the information window and enter the coordinates manually	<Enter>	The added navigational symbol appears in the selected point on the NS screen
If another symbol is required to be added, move the cursor and repeat the above procedure		After each symbol input the graphic editor mode remains ON
Exit from the graphic editor mode	<Esc>	Exit is possible at any stage of editing

- To plot a line or area type object on the chart:

1	2	3
Lines and zones:		
ADD INF\Graphic editor\ Add a new object\Lines	<Enter>	The "Menu Area" displays a window for selecting the type of line
Position the cursor on the required line type	<Enter>	A 'Graphics Cursor' appears
Position the cursor in the object's start point; or use <Tab> key to switch the cursor activity over to the information window and enter the coordinates manually	<Enter>	The line's starting point is displayed on the NS screen
Move the cursor to the next break point of the line, etc. (when an area type objects is plotted, the line should be closed)	<Enter>	The entered segment of the line type object is displayed on the NS screen
After completing the construction of the object exit from the graphic editor mode	<Esc>	Exit is possible at any stage of editing

- To add a text:



1	2	3
• Chart inscriptions: ADD INF\Graphic editor\ Add a new object\Text	<Enter>	A 'Graphics Cursor' appears

Position the cursor in the start point of the text line to be entered; or use <Tab> key to switch the cursor activity over to the information window and enter the coordinates manually	<Enter>	The "Menu Area' displays a text input window
Enter the required text (up to 12 characters)	<Enter>	The entered text is displayed in the selected point on the NS screen
If another text is required to be added, move the cursor and repeat the above procedure		After each text input the graphic editor mode remains ON
Exit from the graphic editor mode	<Esc>	Exit is possible at any stage of editing
• Information stored on the user chart under "i" sign and which can be viewed by using INFO function:		(see "Obtaining Information on the Electronic Chart")
ADD INF\ Graphic editor\Add a new object\ Information	<Enter>	A 'Graphics Cursor" appears
Position the cursor in the point where information should be placed; or use <Tab> key to switch the cursor activity over to the information window and enter the coordinates manually	<Enter>	The bottom part of the screen displays an information input window (10 lines, 64 characters in each) with the cursor in its top left corner (see drawings above)
Enter the required text	<Ctrl>+ <Enter>	"i" sign is displayed in the selected point on the NS screen (see drawings above)

If another text is required to be added, move the cursor and repeat the above procedure		After each sign input the graphic editor mode remains ON
Exit from the graphic editor mode	<Esc>	Exit is possible at any stage of editing
• Information stored on the user chart under the symbol of any object plotted on it:		
ADD INF\Graphic editor\ Edit Info	<Enter>	Acquisition marker appears (see 'Graphics Cursor')
Position the marker on the objects (on the break point in case of a line) so that it is fully within the marker box	<Enter>	The bottom part of the screen displays an information input window (10 lines, 64 characters in each) with the cursor in its top left corner
Enter the required text	<Ctrl>+ <Enter>	To view the entered information on the selected object use INFO function (see "Obtaining Information on the Electronic Chart')
If a text is required to be entered for another object, move the cursor and repeat the above procedure		After each text input the graphic editor mode remains ON
Exit from the graphic editor mode	<Esc>	Exit is possible at any stage of editing

- To strike out an object on the electronic chart:

1	2	3
ADD INF\Graphic editor\ Add a new object\ Canceling by hand	<Enter>	A "Graphics Cursor' appears
Position the cursor on the objects which should be stricken out; or	<Enter>	The strike-out sign appears in the selected point on the NS screen, it is superimposed on the object display

use <Tab> key to switch the cursor activity over to the information window and enter the coordinates manually If another object is required to be stricken out, move the cursor and repeat the above procedure		After the input of each strike-out sign the graphic editor mode remains ON
Exit from the graphic editor mode	<Esc>	Exit is possible at any stage of editing

- For updating the objects, which were previously plotted as corrections on the user chart, see chapter "Editing User Charts'). After making the corrections save the user chart:

1	2	3
ADD INF\Save active chart	<Enter>	The 'Menu Area" displays a window for the input of the active user chart name (see 'Creating User Charts')
Enter, save or change the chart name (up to 8 characters)	<Enter>	The entered user chart name appears in the 'NS Information Area"
Unload the user chart with corrections from the NS as required:		
ADD INF\Unload active chart	<Enter>	

ATTENTION! Paper charts may use datum other than WGS-84. If WP coordinates entered in the NS, are taken from paper charts, it is necessary to take into account WGS-84 offset which is provided in the general information on the chart (see 'Obtaining Information on the Electronic Chart').

3.8.2 Creating User Charts with Service Information Supplementing Electronic Chart Data

A USER CHART is a file with*. CRA extension created using a special NS graphic editor; information from this file is superimposed on the electronic chart display. The NS has a facility for displaying two such charts simultaneously. This permits, e.g., all kinds of service information to be stored and displayed separately from the updating information. In this case the data of both charts is overlaid on the principal nautical chart.

Of two special NS areas (A and B) designed for loading user charts, only one can be active. The user chart currently in the active area is called an active user charts. The operation of the graphic editor, which is used for creating and editing user charts, is possible in the active area only; therefore, the chart currently in the non-active area (non-active user chart) cannot be edited and is merely displayed on the NS screen.

The 'NS Information Area" displays the names of user charts loaded in areas A and B. If no charts are loaded, the relevant lines remain empty.

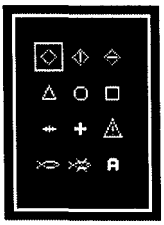
To create a user chart follow the procedure described below:

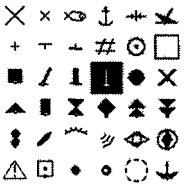
1	2	3
Determine which area (A or B) is free of a loaded user chart		The area whose line in the 'NS Information Area" is empty is considered to be vacant
if there is one vacant area, switch the activity over to this area:		
ADD INF\Active user chart	A or B	The indicator is switched each time <Enter> is pressed
If the user charts are already loaded in both areas, unload one of them from the active area:		
ADD INF\Unload active chart	<Enter>	The line with the name of the loaded active user chart in the NS Information Area becomes empty

ADD INF\Color	ON	To turn on the color selection option for plotting objects on the user chart
ADD INF\Information layers\ All information	<Enter>	To turn on the facility for plotting all kinds of objects

You can now use the graphic editor mode for creating a new user chart. To plot objects on the user chart use the procedure similar to that detailed in chapter "Manual Updating', except for an additional facility for selecting colors when plotting the following objects:

- To plot navigational symbols:





ADD INF\Graphic editor\Add a new object\ Symbols (External Symbols) (see the Note)	<Enter>	The 'Menu Area" displays a symbol selection window (see drawings)
Position the cursor on the required symbol	<Enter>	The Menu Area displays a 7-colour palette
Position the cursor on the selected color	<Enter>	A 'Graphics Cursor' appears
Position the cursor in the point where a certain navigational symbol is required to be plotted; or	<Enter>	The added navigational symbol appears in the selected point on the NS screen
use <Tab> key to switch the cursor activity over to the information window and enter the coordinates manually		
If another symbol is required to be added, move the cursor and repeat the above procedure		After each symbol input the graphic editor mode remains ON
Exit from the graphic editor mode	<Esc>	Exit is possible at any stage of editing

*Note: NS also allows any symbols from the user created own symbols library to be plotted on the user chart. Such library may be created by means of, e.g., WINDOWS PAINTBRUSH graphic editor in the form of *. BMP files. The format description and structure of such files are provided in "Technical Reference" document.*

- To plot Latin alphabet characters:

1	2	3
ADD INF\Graphic editor\Add a new object\Symbols	<Enter>	The 'Menu Area" displays a symbol selection window (see drawings above)
Position the cursor on the required symbol of a Latin alphabet character	<Enter>	The window with this symbol becomes active
Use the trackerball of keyboard to set the required character in the window	<Enter>	The Menu Area displays a 7-colour palette
Position the cursor on the selected color	<Enter>	A 'Graphics Cursor' appears
Position the cursor in the point where the character is required to be plotted; or use <Tab> key to switch the cursor activity over to the information window and enter the coordinates manually		The selected character symbol is displayed in the selected point on the NS screen
If the same symbol is required to be plotted in another point, move the cursor to this point		After each symbol input the graphic editor mode with the selected character remains ON
Exit from the graphic editor mode	<Esc>	Exit is possible at any stage of editing

- To plot lines and zones:

1	2	3
ADD INF\Graphic editor\Add a new object\Lines	<Enter>	The "Menu Area" displays a 7-colour palette
Position the cursor on the selected color	<Enter>	The Menu Area displays a window for selecting the type of line
Position the cursor on the required line type	<Enter>	A 'Graphics Cursor' appears

Position the cursor in the object's start point; or use <Tab> key to switch the cursor activity over to the information window and enter the coordinates manually	<Enter>	The line's starting point is displayed on the NS screen
Move the cursor to the next break point of the line, etc. (when an area type objects is plotted, the line should be closed)	<Enter>	The entered segment of the line type object is displayed on the NS screen
After completing the construction of the object exit from the graphic editor mode	<Esc>	Exit is possible at any stage of editing

- To plot a text:

1	2	3
ADD INF\Graphic editor\Add a new object\Text	<Enter>	A "Graphics Cursor' appears
Position the cursor in the start point of the text line to be entered; or	<Enter>	The Menu Area displays a text input window
use <Tab> key to switch the cursor activity over to the information window and enter the coordinates manually		
Enter the required text (up to 12 characters)	<Enter>	The "Menu Area" displays a 7-colour palette
Position the cursor on the required color	<Enter>	The entered text is displayed in the selected point on the NS screen
If another text is required to be added, move the cursor and repeat the above procedure		After each text input the graphic editor mode remains ON
Exit from the graphic editor mode	<Esc>	Exit is possible at any stage of editing

In addition, the NS enables objects to be plotted on the user chart, for the approach to or crossing of these objects to be tracked in the Voyage Monitoring Mode.

- Guard zones:

1	2	3
ADD INF\Graphic editor\Add a new object\Guard zones	<Enter>	A 'Graphics Cursor' appears
Position the cursor in the Guard zone's start point; or use <Tab> key to switch the cursor activity over to the information window and enter the coordinates manually	<Enter>	The line's beginning is displayed in the selected point on the NS screen
Move the cursor to the next break point of the line, etc., until the zone is complete	<Enter>	The Guard zone's break point is displayed on the NS screen

- Symbols of dangers to navigation:

1	2	3
ADD INF\Graphic editor\Add a new object\Dangers	<Enter>	A 'Graphics Cursor' appears
Position the cursor in the point where a danger symbol is required to be plotted; or use <Tab> key to switch the cursor activity over to the information window and enter the coordinates manually	<Enter>	The added danger symbol is displayed the NS screen (an orange colored cross)
If another symbol is required to be added, move the cursor and repeat the above procedure		After each symbol input the graphic editor mode remains ON
Exit from the graphic editor mode	<Esc>	Exit is possible at any stage of editing

- Depths (see 'Manual Updating').

After completing all the required procedures for creating a user chart, it should be saved:

1	2	3
ADD INF\Save active chart	<Enter>	The 'Menu Area" displays a name input window

Enter the chart name (up to 8 character)	<Enter>	The entered name appears in the appropriate line in the 'NS Information Area"
Unload the user chart with corrections from the NS as required:		
ADD INF\Unload active chart	<Enter>	

3.8.3 Editing User Charts

When it is necessary to display and work with two user charts simultaneously (see 'Creating User Charts') it is necessary to remember that functions for loading, editing, saving and unloading user charts do not operate unless it is the active user chart.
To edit a user chart use follow the procedure below:

1	2	3
Load the user chart which should be edited:		
ADD INF\User chart list	<Enter>	The 'Menu Area" displays a list of user charts arranged in the alphabetical order
Position the cursor on the required chart	<Enter>	The 'NS Information Area" displays the name of the loaded user chart
Set the color range of object display: ADD INF\Color	OFF ON	To turn on the display of objects in the orange color of corrections only To display the objects in the colors they were plotted in
ADD INF\Information layers\All information	<Enter>	To turn on the facility for displaying all the objects on the user chart

In the graphic editor mode the NS provides the following capabilities for editing user charts.

- To edit inscriptions on the user chart:

1	2	3
ADD INF\Graphic editor\Edit object	<Enter>	Acquisition marker appears (see "Graphics Cursor')
Position the marker on the first character of the inscription which should be edited, so that it is within the marker box	<Enter>	The 'Menu Area" displays a text input window containing its initial version
Edit the text	<Enter>	The Menu Area displays a 7-colour palette
Position the cursor on the selected color	<Enter>	The edited inscription appears in the same position on the NS screen

- Editing lines and zones plotted on the user chart:

1	2	3
ADD INF\Graphic editor\Edit object	<Enter>	Acquisition marker appears (see 'Graphics Cursor')
Position the marker on any part of the line	<Enter>	The marker "acquires" the line and turns to the "Graphics Cursor'
Move the cursor to the required point	<Enter>	The line is re-drawn in accordance with a set point
Move the cursor and repeat the procedure as required	<Enter>	After each symbol input the graphic editor mode remains ON
Exit from the editing mode	<Esc>	Exit is possible at any stage of editing

- To edit a text stored under "i" information sign or under any object on the user chart:

ADD INF\Graphic editor\Edit info	<Enter>	Acquisition marker appears (see 'Graphics Cursor')

Position the marker on the information sign of object (a break point for the line type object) so that it is fully within the marker box	<Enter>	The bottom part of the screen displays a window with an entered text and a cursor in the top left corner
Edit the text	<Ctrl>+ <Enter>	Information sign or an objects remains in its position but with a new text
Move the cursor and repeat the procedure as required		After each symbol input the graphic editor mode remains ON
Exit from the editing mode	<Esc>	Exit is possible at any stage of editing

- To delete objects from the user chart with an option to re-construct them:

1	2	3
Turn off the display of deleted objects: ADD INF\Show deleted	OFF	
To delete an object: ADD INF\Graphic editor\ Delete object	<Enter>	Acquisition marker appears (see 'Graphics Cursor')
Position the marker on the object to be deleted	<Enter>	The acquired object disappears from the user chart
When a deleted object is required to be re-constructed: ADD INF\Show deleted	ON	All the deleted objects are displayed on the user chart (in a special deleted object color)
ADD INF\Move to Active Chart	<Enter>	Acquisition marker appears

Position the marker on the objects to be re-constructed	<Enter>	The object acquires the color which it was plotted on the chart with

- To shift an object:

1	2	3
ADD INF\Graphic editor\Shift object	<Enter>	Acquisition marker appears (see 'Graphics Cursor')
Position the marker on the object which should be shifted so that it is fully within the marker box; or	<Enter>	ERBL appears on the selected object (see "Obtaining Additional Information in Work with the NS in the Voyage Monitoring Mode', item 4)
use <Tab> key to switch the cursor activity over to the information window and enter the coordinates manually		
Position the ERBL's movable point in the place where the acquired object should be shifted to	<Enter>	The acquired object is displayed in a new position

- To shift all the objects use the procedure similar to that used for shifting a single object, except that regardless of which chart object is selected, all the objects on the active user chart are shifted.

After completing the required procedures for chart editing, save the edited chart:

1	2	3
ADD INF\Save active chart	<Enter>	The 'Menu Area" displays a name input window with the name of the loaded active user chart
Save or change the chart name (up to 8 characters)	<Enter>	A newly entered name of the user chart appears in the appropriate line of the 'NS Information Area"
Unload the user chart with corrections from the NS as required: ADD INF\Unload active chart	<Enter>	

3.8.4 Presentation of Objects on the User Charts and Work with Two User Charts Simultaneously

When working with the user charts (see 'Creating User Charts') it is necessary to remember that the NS generalization mode does not allow the chart objects (symbols in particular) to be presented at scales smaller than 1: 600, 000.

To load two user charts simultaneously use the following procedure:

1	2	3
Load a user chart in area A.		
ADD INF\Active user chart	A	Area A is activated
ADD INF\User chart list	<Enter>	To display a list of user charts arranged in the alphabetical order
Position the cursor on the required chart	<Enter>	The name of the loaded user chart appears in the appropriate line of the 'NS Information Area"
Activate area B and use the same procedure for loading a user chart in area B		User charts previously loaded in these areas are unloaded automatically. If this process involves a chart which has been edited, and the changes have not been saved, the Menu Area will display a window with a request to save them as required
Select user chart objects which should be displayed on the NS screen:		(see also 'Turning On/Off the Display of Various Information Layers')
ADD INF\Information layers	<Enter>	To display a list of all the possible chart objects
ADD INF\Information layers\ (chart object)	ON	To turn on the display of the respective chart/object on the screen
	OFF	To turn off the display of the chart object in question

Now, in the mode of displaying two user charts, it becomes possible to duplicate the data from one chart on the other chart:

1	2	3
ADD INF\Graphic editor\ Merge charts	<Enter>	Data from the non-active chart is duplicated on the active user chart (see 'Creating user Charts')
Save the changes: ADD INF\Save active chart	<Enter>	The Menu Area displays a name input window with the name of the loaded active user chart
Save or change the chart name	<Enter>	

3.8.5 Networking Information on the User Charts

This capability appears when the NS is operating within a network. This mode of the NS operation is set via "SYSTEM CONFIGURATION" utility (see "Technical Reference" and "Utilities" documents). In this case "Networking" section containing a single "Equalize data" command appears in ADD INFO submenu of the "slave" stations main menu. When this function is operating, the collection of user charts in this station is compared to the collection of charts in the master station, whereupon certain files available in one of the stations are duplicated in the other one. In this case, out of several user charts with the same name, the most recently modified file is selected and duplicated in both stations.

To "equalize" the data use the following procedure:

1	2	3
ADD INF\Equalize data	<Enter>	"UP-ING" indicator appears in this function's line (start of operation); after the data duplicating process is completed "DONE" message is displayed

3.9 Ship's Log

3.9.1 Viewing and Printing Out the Ship's Log

The NS ELECTRONIC SHIP'S LOG is a daily file where both, navigational and system events are automatically recorded (see below). Besides, the navigator can at any moment of time make some manual entries, enter the weather data and own comments.
The ship's log has a form of a table consisting of two parts, of which only one can be displayed at a time: top or bottom part. Use the cursor for making up and viewing log pages.

After the log is called (be default) the upper part of the SHIP'S LOG TABLE is displayed, it contains the following parameters:

Date	12-12-95	12-12-95	12-12-95	12-12-95	12-12-95
Time	12 00 00 (02 00E)	12 08 08 (02 00E)	12 08 08 (02 00E)	12 21 48 (02 00E)	13 00 00 (02 00E)
Event	WATCH	EVENT	EVENT	WP 27, TEST2 54°41 872N 18°52 454E	TIME
Pos tion by	DGPS com 4	DGPS, com 4	DGPS, com 4	DGPS, com 4	DGPS, com 4
Lat	54°47 869N	54°45 355N	54°45 338N	54°42 378N	54°36 923N
Lon	18°51 923E	18°52 899E	18°52 182E	18°52 483E	11°05 388E
Secondary	no secondary	no secondary	no secondary	no secondary	no secondary
COG SOG	176 6° 13 0 kt	176 6° - 13 0 kt	176 6° - 13 0 kt		123 5° - 15 0 kt
HDG LOG	176 6° - 13 0 kt	176 6° - 13 0 kt	176 6° - 13 0 kt		123 5° - 15 0 kt
Average Speed	13 0 kt	13 0 kt	13 0 kt		15 0 kt
Watch d st LOG	28 4 28 4 nm	1 7 - 1 7 nm	1 8 - 2 0 nm		14 2 - 14 2 nm
Day d st LOG	168 4 168 8 nm	170 1 - 170 5 nm	170 3 - 170 7 nm		182 5 - 183 0 nm
Voyage dst LOG	200 9 201 5 nm	202 7 - 203 2 nm	202 9 - 203 4 nm		215 1 - 215 6 nm
Remarks			pilot for 14 30		

- Date (date, month, years) - ship's date;
- Time (hours, minutes, seconds and time shift with reference to GMT) -ship's time and time zone;
- Event - an event recorded in the ship's log via *EVENT* function (see 'Keeping the Ship's Log'); (this data is displayed with both, upper and lower parts of the table);
- Position by - primary positioning method and (in brackets) the number of the port which this positioning system is connected to;
- Lat and Lon - latitude and longitude of the recorded position;
- Secondary - secondary positioning method and (in brackets) the number of the port which this positioning system is connected to,
- COG and SOG - course and speed over the ground;
- HDG and LOG - gyro course and log speed;
- Average Speed - average speed over the last 10 minutes of the watch,

- Watch dist/LOG - distance covered during the watch (chart/log);
- Day dist/LOG - distance covered during the day (chart/log);
- Voyage dist/LOG - distance covered during the voyage (chart/log);
- Remarks - a cell for the input of comments.

When the cursor moves down, the log's bottom part is displayed, it contains:

Date Time Event	12-12-95 12:00 00 (02 00E) WATCH	12-12-95 12:08:00 (02:00E) EVENT	12-12-95 12:08:08 (02:00E) EVENT	12-12-95 12:21:48 (02·00E) WP 27, TEST2 54°41.872N 10°52 454E	12-12-95 13 00 00 (02 00E) TIME
Charts displayed	D170 UT 08-09-95 U D142 UT 29-08-95 U	D142 UT 29-08-95 U G30 UT 18-11-95 U	D142 UT 29-08-95 U G30 UT 18-11-95 U	G31 UT 18-11-95 U D142 UT 28-09-95 U G30 UT 18-11-95 U	G36 UT 18-11-95 U G30 UT 18-11-95 U A2365 UT 21-10-95 U 20100 UT 04-11-95 U
Wind dir - spd Wave dir - hgt Visibility P Atm T Atm T Water Revolution	200° - 11.0 m/s 210° - 3 5 nm 755 0 mmHg +11 0 °C +9 0 °C 122				

- Charts displayed (chart number, type and source, issue date, validity) - charts which were displayed on the NS screen at the recorded moment of time;

and weather data entered by the navigator:

- Wind dir/spd - wind speed and direction;
- Wave dir/hgt - waves' direction and height;
- Visibility - visibility;
- P Atm - atmospheric pressure;
- T Atm - air temperature;
- T Water - water temperature;
- Revolution - main engine RPM.

The list of charts under the vessel's position contains the following abbreviations:

1) For indicating the chart's type and source:

   RA - UK Admiralty raster charts;
   RN - NOAA raster charts;
   VT - TRANSAS vector charts;
   DS - vector charts converted from S57 format charts.

2) For indicating the chart's status (their appropriateness for use):

   V - verified charts;

U - unverified charts;
R - re-issued vector charts (a new edition is available).

To leaf through the log use the trackerball or the following keys:

- <Ctrl>+ cursor control key - to view the upper and lower parts of the table, or to move one column to the left/right;
- <Ctrl>+ <PgUp> - to move 10 columns to the left;
- <Ctrl>+ <PgDown> - to move 10 columns to the right;
- <Ctrl>+ <Home> - to move to the beginning of the log;
- <Ctrl>+ <End> - to move to the end of the log;
- <Alt>+ <End> - to display the latest 5 entries in the ship's log (regardless off whether the cursor is within the table or not).

All the EVENTS are automatically documented in the ship's log and are classified into several groups according to their ability to be displayed in it. Table 3. 9. 1 lists the events by groups, specifies the ship's log table parameters documented when an event is recorded, and includes notes. A full set of documented parameters implies the recording of all the data included in the table, part of it means that only some of the data will be recorded.

Table 3.9-1

1. Events permanently displayed in the ship's log;

Event	Set of documented parameters	Comments
1	2	3
START	Complete	NS started
STOP	Complete	NS turned off
EVENT	Complete	Compulsory recording at the navigator's command (see "Keeping the Ship's Log')
WATCH	Complete	End of watch
TIME	Complete	Automatic time entry
GMT DAY	Complete	Change of GMT day
CORRECTIONS	Complete	Input of offset to the coordinates obtained from the position sensor
TIME ZONE	Complete	Change of ship's time
WAY POINT	Complete	Passing of a WP

2. "Sensors" group:

1	2	3
SENSOR CONNECTION	Complete	Positioning sensor connected
SENSOR DISCONNECTION	Complete	Positioning sensor disconnected

3. "Network" group (for a slave station only):

1	2	3
CONNECT TO MASTER	Complete	Connected to the master station
DISCONNECT FROM MASTER	Complete	Link with the master station lost

4. "Charts" group:

1	2	3
CHART STATUS CHANGED	Part	Any change in the set and status of the displayed charts
SCREEN CO-ORDS CHANGED	Part	Screen re-draw with the shift of boundaries
SCALE CHANGED	Part	Change of the current scale at the operator's command
LOAD POSITION	Part	Loading of any chart under the vessel's position (see 'Loading Charts Required by the User', item 1)
SHOW ORDER CHANGED	Part	Change of chart overlay order in the chart display ('Changing the Order of Overlaying the Displayed Charts')
GET CHART CONTROL	Part	Chart's navigational information is taken into account in the Voyage Monitoring Mode
CANCEL CHART CONTROL	Part	Chart's navigational information is not taken into account in the Voyage Monitoring Mode

5. "Route" group:

1	2	3
LOAD ROUTE	Part	Loading of the route to be proceeded by in the Voyage Monitoring Mode
UNLOAD ROUTE	Part	Unloading of the route

6. "Alarms" group:

1	2	3
SET ALARM	Part	Alarm triggered off
RESET ALARM	Part	A value of the monitored parameter, which when exceeded, caused the alarm to be triggered off, is back within the set limits
REACT ALARM	Part	Alarm acknowledgement by the operator
ENABLE ALARM	Part	Alarm enabled
DISABLE ALARM	Part	Alarm disabled

7. "Layers" group:

1	2	3
(object class) SET OFF	Part	Switching off the display of a certain object class (see 'Turning On/Off the Display of Various Information Layers')
(object class) SET ON	Part	Turning on the display of the given class objects

8. "Settings" group:

1	2	3
(type of setting) SET (function's indicator po-sition)	Complete	Settings made by the operator

Note: Groups of events 2-8 are not displayed by default in the ship's log table.

To view and print out the current ship's log use the following procedure:

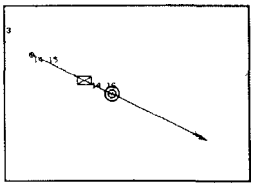
1	2	3
Select for the display only the data required to be viewed and printed out:		
LOGBOOK\Log View Filter\ (group of events)	ON	This group of events is displayed in the log and is included in the printed out document, whilst time marks of events of this group are displayed on the vessel's track
	OFF	The group is not displayed or included in the printout, respective time marks are deleted from the track
LOGBOOK\View log book (or pressing <Ctrl>+ <F8> hot keys)	<Enter>	The Menu Area displays a list of log entries, date by date, in the order reverse to chronological
Position the cursor on the top line (with the current date)	<Enter>	The NS screen displays the upper part of the ship's log table with a cursor, whilst time marks corresponding to the events recorded in the log appear on the vessel's track
After viewing exit into the NS main menu	<Esc>	The table remains on the screen
Print out the ship's log in the selected time interval:		
LOGBOOK\Print Log Book	<Enter>	The "Menu Area" displays a window for the input of the time interval for the log printout
Enter the time interval containing the events required to be printed out	<Enter>	The bottom line of the window displays: "Print? (Y/N)" request for printout confirmation

	Y	To print out the document
	N	To cancel the printout
Close the ship's log as required	<Esc>	A window with the ship's log table disappears from the NS screen

3.9.2 Keeping a Ship's Log

The navigator is provided with the following NS facilities for keeping an electronic ship's log (see 'Viewing and Printing Out the Electronic Ship's Log').

1. Compulsory instantaneous entry in the ship's log (e. g., "Man Overboard" alarm):



1	2	3
EVENT (or press <F4> hot key)	<Enter>	A vessel position entry is made in the ship's log, a distinctive mark with the indication of time is plotted on the electronic chart (see the drawing)

2. Input of comments on any ship's log entry:

1	2	3
Select for the display only the data which is required to be commented on:		(see also Viewing and Printing Out the Electronic Ship's Log')
LOGBOOK\Log View Filter\ (group containing the required event)	ON	This group of events is displayed in the log (see the warning after the table)
LOGBOOK\View log book (or press <Ctrl>+ <F8> hot key)	<Enter>	The 'Menu Area" displays a list of ship's log entries, day by day, in the order reverse to chronological
Position the cursor on the required date of entry in the ship's log	<Enter>	The NS screen displays the top part of the ship's log table for this date
Leaf through the log (see 'Viewing and Printing Out the Electronic Ship's	<Enter>	A cursor appears in the cell

Log'), position the cursor in Remarks cell where the comment is required to be entered		
Type and enter the required text	<Ctrl>+ <Enter>	The cell becomes inactive, the cursor remains in the table

ATTENTION: When turning on the display of certain groups of events in the ship's log, it is necessary to remember that whenever any event from this group occurs, the time of the event is automatically plotted on the vessel's track. To avoid overloading of the track display, it would, therefore, be worthwhile to turn off the groups of events, which are not used at the moment.

3. Set the minimum time interval for the automatic recording of the vessel's position in the ship's log:

1	2	3
LOGBOOK\Routing INFO entry	<Enter>	The 'Menu Area" displays a list of possible time interval values for the automatic recording of the vessel's position in the ship's log
Position the cursor on the required value	<Enter>	"TIME" event entry will be made (see Viewing and Printing Out the Electronic Ship's Log') over the set time interval

4. Reset the distance accumulated during the watch, day or the voyage:

1	2	3
LOGBOOK\Reset distance	<Enter>	The Menu Area displays a window for the input of the distance accumulated over the voyage
In the input window set 0 (or some other required value of the accumulated distance)	<Enter>	"RESET DISTANCE TO..." entry is made in the ship's log, and in the future the entered value will be used for the accumulated distance

3.9.3 Viewing Archive Data

All the data reflecting the vessel's position is automatically entered in the ship's log (see Viewing and Printing Out the Electronic Ship's Log') and is archived every day. This enables the situations, which arose in the process of the voyage to be at any time re-constructed on the chart.

Apart from the ship's log, files with the ownships' and targets' tracks can be loaded for re-constructing such situations:

1	2	3
LOGBOOK\Track history Position the cursor on the required track recording date	<Enter> <Enter>	The 'Menu Area" displays a list of vessel tracks records, day by day, in the order reverse to the chronological The track recorded on the selected date is loaded in the NS
Select discretion of the track display: LOGBOOK\Track precision	10s 1min	The loaded track is displayed with the plot interval (distance between the track points) of 10 seconds The track is displayed with the plot interval of 1 minute
If required, load the route and user charts which were used on this date		(see chapters 'Loading of and Work with the Route and Voyage Schedule in the Voyage Monitoring Mode' and 'Presentation of Objects on User Charts and Work with Two Charts Simultaneously')
Load the log as of the date selected for viewing: LOGBOOK\View log book (or press <Ctrl>+ <F8> hot keys)	<Enter>	The Menu Area displays a list of ship's log entries, day by day, in the order reverse to chronological

Position the cursor on the required date of the ship's log entry	<Enter>	The NS screen displays the top part of the ship's log table for this date
Use REVIEW function to view the track segments of interest		(see "Viewing Other Charts and Navigation Areas')

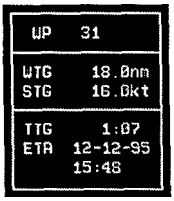
ATTENTION! When *LOGBOOK\Track history* function is invoked, the 'Navigation Mode' is automatically exited from.

3.10 Solving Navigational Tasks

3.10.1 Calculating Estimated Time of Arrival (ETA) in the Waypoint from the Current Vessel Position

These calculations are made on the basis of the route loaded in the NS and from the following parameters set by the navigator.

- WP (Way Point) - numbers of the WP, the time of arrival wherein should be calculated;
- STG (Speed To Go) - speed of proceeding along the route, in knots. The results of calculations are:
- WTG (Way To Go) - total distance to the WP in miles;
- TTG (Time To Go) - time of sailing to the set point (hours, minutes),
- ETA (Estimated Time of Arrival) - sate and time of arrival in this point (date, month, year and time).



To make this kind of calculations use the following procedure

1	2	3
TASK\WP ETA	<Enter>	The 'Menu Area" displays a data input window with the current WP number (see the drawing)
Enter the number of the WP which the ETA should be calculated for	<Enter>	WTG value is calculated and displayed in a window, STG line is activated

Enter STG value	<Enter>	The results of calculations are displayed in the bottom part of the window
	<Esc>	To remove the data input window from the NS screen

Note: the values are checked as they are being entered. If any incorrect data is identified, there will be no data input.

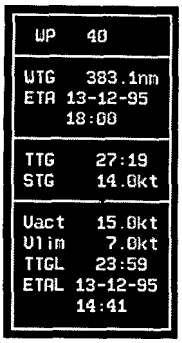
3.10.2 Calculations of Speed To Go

This NS function is used for calculating the speed to go on the route (STG) to arrive in the WP at the set time (ETA), as well as for calculating the time of arrival in the point of changing the engine setting (ETAL), where it is necessary to switch to the set limit speed (Vlim) in order to approach the WP at the same set time (ETA). The first part of the task can be used on the regular service vessels for calculating the speed to go. The second part can be used, e. g., for determining the place and time of switching to the maneuvering mode in order to arrive in the pilot meeting place at the set time.

These calculations are made on the basis of the route loaded in the NS and from the following parameters set by the navigator:

- WP (Way Point) - WP number;
- ETA (Estimated Time of Arrival) - date and time of arrival in this point (sate, month, year and time);
- Vact - vessel's actual speed before changing the engine setting, in knots;
- Vlim - limit speed required at the approach to the given RP, in knots.
- The results of these calculations are:
- WTG (Way To Go) - distance to the indicated point in miles;
- TTG (Time To Go) - time of sailing to the set point (hours, minutes);
- STG (Speed To Go) - speed to go in knots;
- TTGL - time of sailing to the point of changing the engine setting;
- ETAL - date and arrival in this point.

To make this kind of calculations use the following procedure:



1	2	3
TASK\WP STG	<Enter>	The 'Menu Area" displays a data input window with the number of the current WP (see the drawing)
Enter the required WP number	<Enter>	WTG value is calculated and displayed in a window, ETA line is activated
Enter ETA value	<Enter>	STG value is calculated and displayed in a window, Vact line is activated
Enter Vact	<Enter>	Vlim line is activated
Enter Vlim	<Enter>	The results of calculations are displayed in the bottom part of the window
Display the calculations results on the information panel	<Enter>	The input window is removed from the NS screen, the appropriate section of the 'NS Information Area" displays the calculated STG value and ETA set for this WP

Note: the values are checked as they are being entered. If any incorrect data is identified there will be no data input

3.10.3 True Wind Calculations

These calculations are made from the vessel's motion parameters (course and speed) and measured parameters of the relative wind which are entered by the navigator:

- Speed - measured wind speed, m/sec;
- Port/Stbd - vessel's board which the observed wind was directed to;
- R/Brg - observed wind's relative bearing, degrees.
- The results of the calculations are:
- Speed - true wind speed, m/sec;
- Brg - true wind direction, degrees

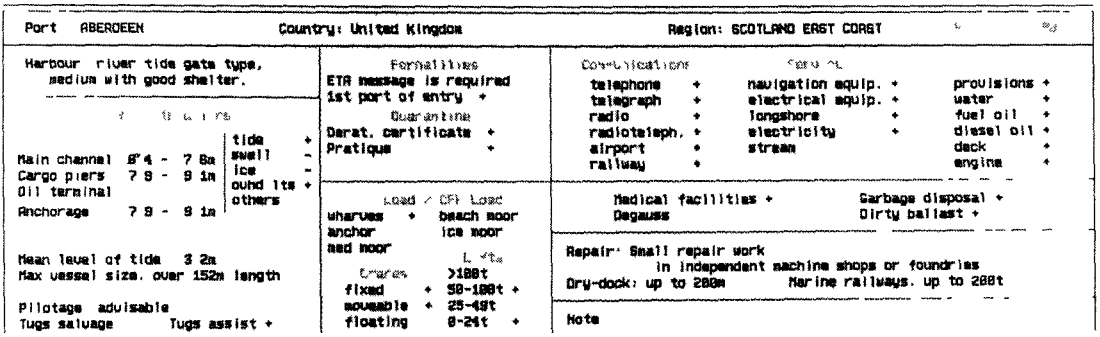
To make this kind of calculations use the following procedure:

1	2	3
TASK\WIND	<Enter>	The 'Menu Area" displays a data input window with the vessel's current course and speed, and activated 'Speed' line in Relative section (see the drawing)
Enter the measured parameters of relative wind one by one	<Enter> after each input	True wind parameters are calculated and displayed in the "Actual" window section
	<Esc>	The data input window can be removed from the NS screen at any stage of the data input and after the calculations

3.10.4 Obtaining Information on Ports

Information on the ports is based on document PUB 150, "World Port Index" published by the Defense Mapping Agency, USA It should be noted that this is only approximate information, which does not necessarily include all the navigational and other features affecting the safety at sea, or the latest updates. To make any additions to this data, use NS facility for 'Creating User Charts' with service information supplementing electronic chart data (see also 'Making Manual Updates').

Information on the selected port is displayed in a window in the bottom part of the NS screen, and contains the following groups of data:



- Name of the port, country and area which the port belongs to (in the top line of the information window);
- Harbour - harbour type and size;
- Entrance restrictions - list of natural factors restricting the vessels' entrance;
- Depths - depths in the main channel, at the principal cargo berth and/or at the oil terminal and at the principal anchorage;
- Pilotage - pilotage;
- Tugs - tugboats;
- Formalities - port formalities;
- Load/OFF Load - cargo handling operations;
- Communications - available communications;
- Services - provided port services;
- Supplies - supplies;
- Medical facilities - medical institutions;
- Repair - repair facilities;
- Note - comments.

To obtain information on the required port use the following procedure

TASK\PORT\Load	<Enter>	To load the database on ports in the RAM
Select depth measurement units:		

TASK\PORT\Units	METERS	Soundings and heights in the port information are displayed in meters
	FEET	Depths and heights are measured in feet

To select (or search) for the port of interest, use one of the following procedures.

- By the port name:

1	2	3
TASK\PORT\By name...	<Enter>	The bottom part of the screen displays an information window containing the list of all the ports available in the database, arranged in the alphabetical order
Use the keyboard for typing the first letters of the port name as required for the search	<Enter>	The same window displays information on the selected port (in case of an incorrect input, or when the required port is not available in the database, a small question mark appears to the left of the cursor)
Repeat the procedure as required	<Esc>	A window with the list of ports appears again
	<Esc>	To remove the information window from the screen

Note: when a port has several known names, the list contains all of them, alternative names having references to the principal one.

- By the area:

1	2	3
TASK\PORT\By region…	<Enter>	The bottom part of the screen displays an information window with the list of all the areas arranged in the alphabetical order

Position the cursor on the required area, or use the keyboard for typing the first letters of its name as required for the search	<Enter>	The same window displays a list of ports belonging to this area
Position the cursor on the required port, or use the keyboard for typing the first letters of its name as required for the search	<Enter>	Information on the selected port is displayed
Repeat the procedure as required	<Esc>	A window with the list of ports is displayed again
	<Esc>	To remove the information window from the screen

- By the country name:

1	2	3
TASK\PORT\By country…	<Enter>	The bottom part of the screen displays an information window with the list of all the countries arranged in the alphabetical order
Position the cursor on the required area, or use the keyboard for typing the first letters of its name as required for the search	<Enter>	The same window displays a list of ports belonging to this country
Position the cursor on the required port, or use the keyboard for typing the first letters of its name as required for the search	<Enter>	Information on the selected port is displayed
Repeat the procedure as required	<Esc>	A window with the list of ports is displayed again
	<Esc>	To remove the information window from the screen

- By the cursor position:

1	2	3
TASK\PORT\By cursor…	<Enter>	A "Graphics Cursor' appears
Position the cursor in the place of interest on the chart	<Enter>	The bottom part of the screen displays an information window with the list of all the ports within the range of 30 miles from the cursor position
Position the cursor on the required port, or use the keyboard for typing the first letters of its name as required for the search	<Enter>	The same window displays information on the selected port
Repeat the procedure as required	<Esc>	A window with the list of ports is displayed again
	<Esc>	To remove the information window from the screen
Unload the database from RAM as required:		
TASK\PORT\Unload	<Enter>	

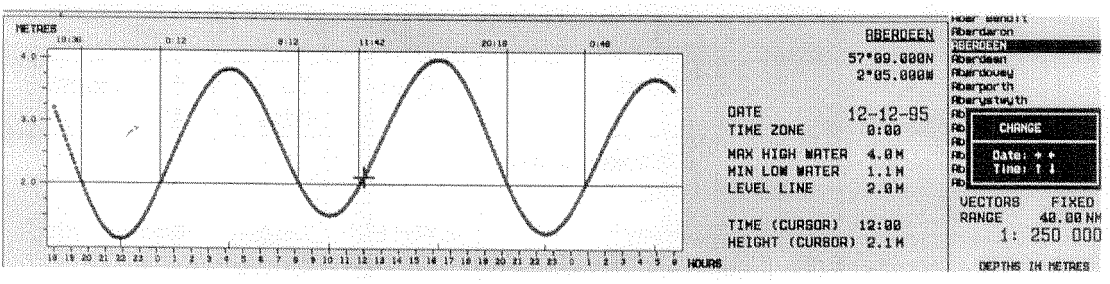
Having once viewed information on the required port, you will be able to use the NS facilities for referring to this information without having to repeat the above procedures (in this case the database should be loaded in the RAM):

1	2	3
TASK\PORT\Screen ON/OFF	<Enter>	To display/hide a window with information provided during the latest access to the function

3.10.5 Obtaining Information on Tides

Tides are calculated in full compliance with the procedure and from the data described in the UK Admiralty Tables NP 158 and with accuracy commensurate with this procedure.

Information on tides at the selected reference point is displayed in a window in the bottom part of the NS screen, and contains the following data.



- tide curve showing the tidal rise (in meters or feet) in accordance with time (local or ship's time);
- water level set by the navigator using the vessel's draft and the least depth of channel;
- time intervals marked with vertical lines and highlighted with color, when the water level is higher than the set level,
- additional information section which includes:
  - reference point name and its coordinates
  - Date - the set date, which the calculations were made for
  - Time zone (or Ship's time) - time shift with reference to GMT (or an indication that the ship's time is used)
  - Max high water - maximum high water
  - Mm low water - minimum low water
  - Level line - set water level
  - Cursor: time, height - time and water rise corresponding to the cursor position.

To control the cursor when working with the tide curve, use the trackerball or cursor control keys on the keyboard Use the trackerball sideways motion (or the appropriate keys on the keyboard) to change the set calculations data which is in this case shown in the orange color To determine the water rise at any set time, move the trackerball up and down (or use the appropriate keys on the keyboard) thus moving the cursor from this moment of time and obtaining the water rise readout in the additional information section

Information on tides can be obtained both, for the current vessel position and for the required reference point

1. The tidal rise in the current vessel position is assumed to be equal to the tidal rise in the closest reference point (if there is any within the range of 30 miles. To determine it use the following procedure:

1	2	3
TASK\TIDE\Load	<Enter>	To load the database on tides in RAM
Turn on the display of data on the tidal rise:		
CONFIG\Display (or press <Tab> hot key successively)	SYSTEM	Display System mode is turned on the 'NS Information Area', where the tidal rise is specified
If required, determine the closest reference point which this information was provided for:		
TASK\TIDE\Nearest place	<Enter>	The Menu Area displays an information window containing the reference point name, its coordinates and distance from the vessel position If there are no reference points within the range of 30 miles, the Menu Area displays a "Not found" message (which is acknowledged by pressing any key)

2. To obtain information on tides at the selected reference point use the following procedure:

1	2	3
TASK\TIDE\Load	<Enter>	To load the database on tides in RAM
Select the tidal rise measurement units: TASK\TIDE\Units	METRES FEET	To show tidal rise in metres To show tidal rise in feet

Select the time measurement option which the tide curve will be referenced to:		
TASK\TIDE\Time	TZONE	To obtain information for the local time
	SHIP'S	To obtain information for the ship's time

To select a reference point of interest use oneof the following procedures.

- By the reference point name:

1	2	3
TASK\TIDE\By name...	<Enter>	The 'Menu Area" displays a name input window
Use the keyboard to type the reference point name or several beginning letters for the search	<Enter>	If several beginning letters of the name were entered, the Menu Area displays a list of reference point names arranged in the alphabetical order and starting with the typed letters; if the database on the reference points contains the entered name, the Menu Area displays a data input window (see below); if the database does not contain the entered name, the Menu Area displays a "Not found" message (which is acknowledged by pressing any key)
Position the cursor on the required reference point, or use the keyboard for typing	<Enter>	The Menu Area displays an input window containing the name and coordinates of the selected reference

the first letters of its name as required for the search		point, as well as the default data: current date and water level above the datum equal to 2 m

- By the cursor position:

1	2	3
TASK\TIDE\By cursor...	<Enter>	A 'Graphics Cursor' appears
Position the cursor in the place of interest on the chart; or use <Tab> key to switch activity to the information window and enter the coordinates manually	<Enter>	The Menu Area displays a list of all the reference points within the range of 30 miles from the cursor position; if there are no reference points within the range of 30 miles, the Menu Area displays a "Not found" message (which is acknow-ledged by pressing any key)
Position the cursor on the required reference point, or use the keyboard for typing the first letters of its name as required for the search	<Enter>	The Menu Area displays an input window containing the name and coordinates of the selected reference point, as well as the default data: current date and water level above the datum equal to 2m

After the data input window has appeared in the "Menu Area', use the following procedure to display the tide curve:

1	2	3
Enter the required date group by group of digits	<Enter>	"Level" line is activated
Enter the water level above the datum you are interested in	<Enter>	Information on tides is displayed in the bottom part of the NS screen
Move the cursor to read off the required tide parameters		(Procedure to work with the tide curve is specified in the introductory part of this chapter)

	<Esc>	To remove the tide curve from
Unload the database from RA< as required: TASK\TIDE\Unload	<Enter>	

Having once viewed information on the tide, you will be able to use the NS facilities for referring to this information without having to repeat the above procedures (in this case the database should be loaded in the RAM):

1	2	3
TASK\TIDE\Screen ON/OFF	<Enter>	To display/hide a window with information provided during the latest access to the function

3.10.6 *Obtaining Information on Currents*

NS database on tidal currents has been created on the basis of information presented on paper nautical charts where the tidal current vectors are calculated for each hour for individual points of navigation area covered by the given chart. Information on the surface currents was created after the processing of the initial (observed) data of the US National Oceanography Centre (NODC and NOAA).

The NS has a facility for displaying vectors and taking into account the effect of tidal and surface currents. Vectors of tidal currents are shown on the NS screen in the blue color, whilst the surface currents are shown in the black color. Vectors originate in the reference points for which the coordinates and parameters of currents were taken from the aforementioned sources. For the point of the current vessel position the acting current is determined by interpolation between the closest reference points.

In addition to displaying vectors for the current moment of time, the NS permits viewing the dynamics of changes in the currents with discretion of one hour (for the tidal currents) and a month (for surface currents).

1. To display vectors of currents on the NS screen use the following procedure:

1	2	3
TASK\CURRENT\Load (in both sections of CURRENT submenu)	<Enter>	To load the database on currents into RAM
CHART\Information layers\ Currents	ON	To display vectors of currents on the NS screen
Turn on the display of data on the tidal status and the current acting in the vessel position: CONFIG\Display (or press successively <Tab> hot key)	SYSTEM	Display System Mode is switched on in the 'NS Information Area', where the tidal rise, direction and speed of current are displayed

2. To display the condition of the acting current in the navigation area of interest over a certain time interval, use the following procedure:

1	2	3
TASK\CURRENT\Load (in both sections of CURRENT submenu)	<Enter>	To load the database on currents into RAM
CHART\Information layers\Current	ON	To display vectors of currents on the NS screen
Display the required fragment on the electronic chart and set the scale suitable for displaying vectors of currents (see Notes)		(see chapters "Viewing Other Charts and Navigation Areas' and "Scaling of Electronic Chart Display')

- For the tidal currents:

1	2	3
TASK\CURRENT\By hour: (in "Tidal currents' sections)	<Enter>	The Menu Area displays an information window showing the number of hours to be counted from

		the current moment, and the scale of visual estimation of the current's speed represented by the vector
Set the required time by incrementing (one hour per key stroke) the time interval	Any key except <Esc>	Vectors of currents in the displayed electronic chart area are changing with the passage of time (see Fig. 3–10)

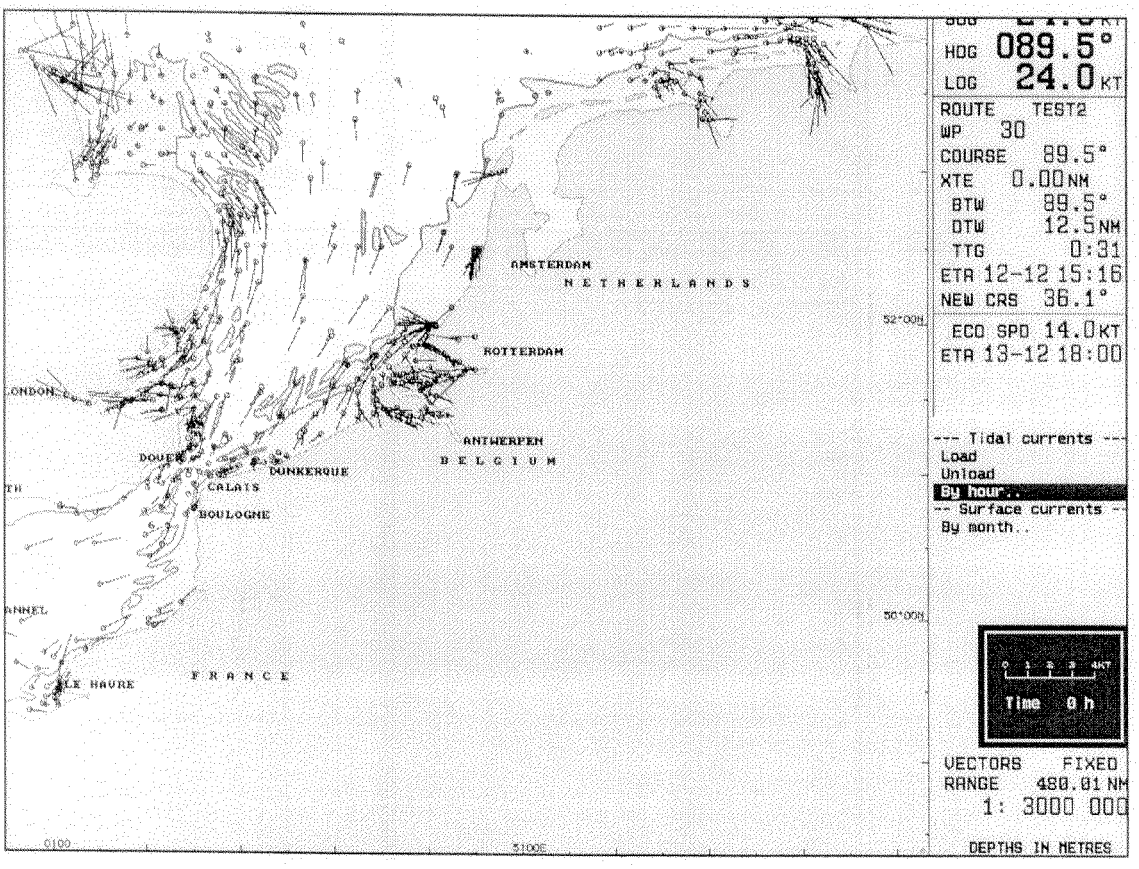


Fig. 3–10

- For the surface current:

1	2	3
TASK\CURRENT\By month… (in Surface currents section)	<Enter>	The Menu Area displays an information window showing the calendar month, which the displayed vectors and scales of visual assessment of current's speed represented by the vector, correspond to
Press the key successively to set the required month of the year	Any key except <Esc>	Vectors of currents in the displayed electronic chart area are changing with the passage of time

Note: the vectors of currents are not displayed on the electronic charts on scales larger than 1: 3, 000, 000.

4 TECHNICAL DESCRIPTION OF NAVISAILOR SERIES SOFTWARE

4.1 Purpose and Use of "Technical Description"

4.1.1 Purpose

This document describes briefly each function of the NS main menu (as they arranged in the menu) providing references to the "User Manual" items where they are used

4.1.2 How to Use the "Technical Description"

Information set forth in this document is presented in the form of a table:

NS main menu function	Sort statement of purpose	Number of paragraph and item within the paragraph	"User Manual" paragraph where the function is involved
1	2	3	4

When the menu functions are specified in the first column, the following designations are used:

- capital letters designate the NS main menu keys (see "Menu Area" of the "User Manual");
- "\" means that the function belongs to the submenu of the main menu keys specified before,
- "\\" means that the function belongs to the submenu of the "\" function specified before, etc.

"User Manual" paragraphs which have to do with a particular function are indicated for the NS executive functions only (i. e. functions which do not contain a submenu).

Abbreviations used in the "Technical Description" are similar to those listed in 'Abbreviations Used in the Manual' (see the "User Manual").

4.2 Index of Mate Menu Functions

4.2.1 Ahead

1	2	3	4
AHEAD	To re-draw the screen with the vessel symbol shifting in the direction opposite to the current course; and to turn on Navigation Mode	2.1.3 3.3.3	'Navigation Mode' 'Settings for the NS Operation in the Navigation Mode'

4.2.2 Ship

1	2	3	4
SHIP	To provide access to the functions used for selecting the vessel positioning method, making corrections and desig-nating vessel position monitoring facilities		
\ Correction Primary (Secondary)	To provide access to the functions determining the method of correcting the vessel position		
\\ Offset by target	To correct the vessel position by the ARPA acquired target	3.2.3 item 1	'Correcting the Vessel Position Using ARPA Information'
\\ Offset by ARPA cursor	To correct the vessel position by the ARPA cursor position	3.2.3 item 2	'Correcting the Vessel Position Using ARPA Information'
\\ Offset by ARPA ERBL	To correct the vessel position by the position of ARPA ERBL movable point	3.2.3 item 2	'Correcting the Vessel Position Using ARPA Information'

\\ New pos'n by cursor	To correct the vessel position manually by setting the vessel symbol in the latest position fix point	3.2.4 item 1	'Manual Correction of the Vessel Position'
\\ Enter Course	To enter the vessel's course manually when DR is used for the vessel positioning	3.2.1 item 4	'Selecting the Positioning System'
\\ Enter Speed	To enter the vessel's speed manually when DR is used for the vessel positioning	3.2.1 item 4	'Selecting the Positioning System"
\\ Enter Position	To correct the vessel position manually (when DR is used for the vessel positioning) by the input of fixed vessel position coordinates	3.2.4 item 2	'Manual Correction of the Vessel Position'
\\ Enter Offset	To correct the vessel position manually by the input of offset to the coordinates obtained from the vessel positioning system	3.2.4 item 3	'Manual Correction of the Vessel Position'
\\ Cancel Offset	To cancel all the offsets entered for correcting the vessel position	3.2.5	'Canceling all the Entered Offsets'
\\ Enter YEOMAN Offset	To enter WGS-84 offset during the work with YEOMAN digitizer		(see "Technical Reference" document)
\\ Cancel YEOMAN Offset	To cancel the entered WGS-84 offset during the work with YEOMAN digitizer		(see "Technical Reference" document)
\ Primary pos.	To set the required option of positioning system for the primary vessel positioning	3.2.1 items 1, 2, 3 and 4	'Selecting the Positioning System'

\ Secondary pos.	To set the required option of positioning system for the secondary vessel positioning	3.2.1 items 1, 2, 3 and 4	'Selecting the Positioning System'
\ Auto change	To set the mode of switching automatically to the vessel positioning by DR	3.2.2	'Switching Automatically to the DR Mode'
\ Scale	To set the scale of charts to be taken into account in the Voyage Monitoring Mode	3.3.1	'Setting the Parameters for Monitoring Safety of Navigation'
\ Guard vector	To turn on/off the display of lines monitored for the crossing of safety contours or limits of special purpose areas	3.3.4 item 1	'Auxiliary NS Facilities Used in the Voyage Monitoring Mode'
\ Guard ring	To turn on/off the display of a zone for monitoring the approach to the isolated dangers to navigation	3.3.4 item 2	'Auxiliary NS Facilities Used in the Voyage Monitoring Mode'
\ Head line	To turn on/off the display of course line	3.3.4 item 3	"Auxiliary NS Facilities Used in the Voyage Monitoring Mode'
\ Safety depth	To set the safety depth used in the Voyage Monitoring Mode	3.3.1	'Setting the Parameters for Monitoring Safety of Navigation'
\ Shallow contour	To set the value of the shallow water contour, which the deep water area on S57chart will be distinguished from in color	3.4.9 item 1	'Setting Parameters for Work with S57 Format Electronic Charts'
\ Safety contour	To set the safety contour used in the Voyage Monitoring Mode	3.3.1	'Setting the Parameters for Monitoring Safety of Navigation'
\ Deep contour	To set the value of the deep water contour, which the shallow water area on S57chart will be distinguished from in color	3.4.9 item 1	'Setting Parameters for Work with S57 Format Electronic Charts'

4.2.3 Zoom

1	2	3	4
ZOOM	To display the selected chart fragment or the required sailing area on the NS screen	3.4.7 item 3	'Scaling of Electronic Chart Display'

4.2.4 Scale

1	2	3	4
SCALE	To set the scale of electronic chart display	3.4.7 item 1	Scaling of Electronic Chart Display

4.2.5 Info

1	2	3	4
INFO	To obtain information on the electronic chart and objects plotted on it	3.4.8 items 1 and 2	'Obtaining Information on the Electronic Chart'

4.2.6 Review

1	2	3	4
REVIEW	To load charts by the cursor position; and to view the electronic chart fragments not currently displayed	3.4.2 item 4 3.4.6	'Loading Charts Required by the User' 'Viewing Other Charts and Navigation Areas'

4.2.7 Chart

1	2	3	4
CHART	To provide access to the functions used for work with charts		

\ Load-Pos'n	To load any of the charts whose boundaries the vessel position is currently within	3.4.2 item 1	'Loading Charts Required by the User'
\ Load-List	To load any chart from the collection by its number	3.4.2 item 2	'Loading Charts Required by the User'
\ Charts unload	To unload all the charts from the NS	3.4.4	"Chart Unloading'
\ Grid lines	To turn on/off the coordinate grid on the NS screen	3.4.5 item 1	'Turning ON/Off the Display of Various Information Layers'
\ Chart autoload	To turn on/off the chart Autoloading mode	3.4.1 items 1 and 2 3.4.6 3.4.7 items 1 and 2	'Automatic Chart Loading' Viewing Other Charts and Navigation Areas' 'Scaling of Electronic Chart Display'
\ Chart autoscale	To set the scale of the loaded chart: current NS screen scale original chart scale	3.4.1 item 1 3.4.7 item 4	'Automatic Chart Loading' 'Scaling of Electronic Chart Display'
\ Autoscale ratio	To set the scale for the loaded chart different from its original scale	3.4.1 item 1 3.4.7 item 4	'Automatic Chart Loading' 'Scaling of Electronic Chart Display'
\ Information layers	To provide access to the functions used for turning on/off the display of individual classes of chart information on the NS screen		
\\ Standard display	To turn on/off the display of Standard Display objects	3.4.5 item 4	'Turning ON/Off the Display of Various Information Layers'

\\ Spot soundings	To turn on/off the display of all the soundings	3.4.5 item 2	'Turning ON/Off the Display of Various
\\ Spot soundings to	To turn on/off the display of soundings larger than the setting of this function indicator	3.4.5 item 3	'Turning ON/Off the Display of Various Information Layers'
	To turn on/off the display of the following information layers:	3.4.5 item 2	'Turning ON/Off the Display of Various Information Layers'
\\ Isolated dangers	- isolated dangers to navigation;		
\\ Cables, pipelines	- submerged cables and pipelines;		
\\ Ferry routes \\Names	- ferry crossings; - names;		
\\ All depth contours	- all depth contours larger than the safety depths;		
\\ Seabed	- seabed;		
\\ Chart boundaries	- boundaries of all the charts in the ship's folio;		
\\ Rest information	- other information;		
\\ Marine facilities	- auxiliary information from BSB format charts		
\\ Currents	To turn on/off the display of current vectors	3.4.5 item 2 3.10.6 item 1	'Turning ON/Off the Display of Various Information Layers' 'Obtaining Information on Currents'
\\ Scale bar	To turn on/off the display of "Scale bar" on the NS screen, which gives a clear idea of scale for a visual estimation of ranges	3.3.3	'Settings for the NS Operation in the Navigation Mode'
\ All information	To turn on/off the display of objects of all the classes and categories on the electronic chart	3.4.5 item 4	'Turning "ON/Off the Display of Various Information Layers'

\ DX chart options	To provide access to the functions setting parameters for work with S-57 format electronic charts		
\\ Four shades	To turn on/off the color highlighting of set depth zones on S57 format electronic charts	3.4.9 item 1	'Setting Parameters for Work with S57 Format Electronic Charts'
\\ Shallow pattern	To turn on/off the display of shading in the presentation of areas with depths less than the safety contour on S57 format electronic charts	3.4.9 item 2	'Setting Parameters for Work with S57 Format Electronic Charts'
\\ Use SCAMIN	To select the generalization method for S57 format electronic charts: standard for S57 format generalization method similar to that used for Transas charts	3.4.9 item 3	'Setting Parameters for Work with S57 Format Electronic Charts'
	To select the style of displaying the following objects plotted on S57 format electronic charts:	3.4.9 item 4	'Setting Parameters for Work with S57 Format Electronic Charts'
\\ Full light lines	- lines limiting the light visibility sectors;		
\\ Areas	- limits of area type objects;		
\\ Points	- point type objects;		
\\ Style	- other electronic chart objects		
\ Raster chart INFO	To obtain information on the objects plotted on the raster chart from the data of matching vector charts	3.4.8 item 2	'Obtaining Information on the Electronic Chart'
\ Original scale	To set the scale of the current displayed charts equal to the original paper chart scale	3.4.7 item 4	'Scaling of Electronic Chart Display'

\ Priority*	To turn on the mode of observing the UKHO requirements on the display of ARCS format electronic raster charts	3.4.10 item 1	'Work with ARCS Format Raster Charts'
\ Review ARCS chart*	To view all the information printed on the source paper chart which served as original for an ARCS chart	3.4.10 item 2	'Work with ARCS Format Raster Charts'

☞ ***Note: functions marked with* (asterisk) do not appear in CHART function submenu unless there are ARCS format raster charts available in the ship's folio.***

4.2.8 Route

1	2	3	4
ROUTE	To provide access to the functions used for work with routes and route planning		
\ Select next WP	To perform the following operations during the work with the route loaded in the Voyage Monitoring Mode: to turn on/off the mode of automatic or manual change of WPs;	3.7.7	'Loading of and Work with a Route and Voyage Schedule in the Voyage Monitoring Mode'
\ Enter next WP	- to set manually the number of the monitored WP in the loaded route;		
\ Load route	- to load the route;		
\ Unload route	- to unload the route from the NS;		
\ Arrival circle	- to set the advance distance for the automatic switching of monitored WPs		

\ WP graphic editor	To turn on the graphic editor used for creating and editing the route	3.7.1	'Route Planning on the Electronic Chart'
		3.7.2 item 1	'Creating a Route Plan with a Check for the Presence of Dangers to Navigation'
		3.7.4 item 1	'Editing a Previously Created Route'
\ Check editor	To check the route for the presence of dangers to navigation as it is being created	3.7.2 item 1	'Creating a Route Plan with a Check for the Presence of Dangers to Navigation'
\ Check route plan	To check the route for the presence of dangers to navigation after it has been created	3.7.2 item 2	'Creating a Route Plan with a Check for the Presence of Dangers to Navigation'
\ Route plan table	To turn on the display of table for the input of data on the route when it is created by transferring WPs from the paper chart and during its editing	3.7.3 item 1	'Transferring a Planned Route from the Paper Chart'
\ Load route plan	To load a planned route with the aim of editing or editing, or checking for the presence of dangers to navigation	3.7.2 item 2	'Creating a Route Plan with a Check for the Presence of Dangers to Navigation'
		3.7.4 items 1, 2, 3 and 4	'Editing a Previously Created Route'
\ Unload route plan	To unload the planned route from the NS	3.7.1	"Route Planning on the Electronic Chart'
		3.7.2 item 1	'Creating a Route Plan with a Check for the Presence of Dangers to Navigation'
		3.7.3 item 1	'Transferring a Planned Route from the Paper Chart'

\Save	To save a newly created or	3.7.1	'Route Planning on the
		3.7.2 item 1	"Creating a Route Plan with a Check for the Presence of Dangers to Navigation'
		3.7.3 item 1	'Transferring a Planned Route from the Paper Chart'
		3.7.4 items 1, 2, 3 and 4	"Editing a Previously Created Route'
\ Make reciprocal route	To re-calculate automatically the created route and renumber WPs for the reverse passage	3.7.4 item 3	'Editing a Previously Created Route'
\Link	To combine automatically a loaded planned route with any other route	3.7.4 item 4	'Editing a Previously Created Route'
\ Print	To print out the route (route data input tables)	3.7.1	"Route Planning on the Electronic Chart'
		3.7.3 item 1	'Transferring a Planned Route from the Paper Chart'
\ Equalise data*	To "equalise' the route data stored in the Master and Slave stations	3.7.9	'Networking Information on the Created Routes'

Note: the function marked with (asterisk) appears in ROUTE function submenu only in case of network operation (see "Technical Reference" and "Utilities" documents).*

4.2.9 Add Info

1	2	3	4
ADD INF	To provide access to the function used for work with user charts and manual electronic chart updating		
\ Active user chart	To switch the activity of areas designed for loading the user charts	3.8.2	'Creating User Charts'
		3.8.4	'Presentation of Objects on the User Charts and Work with Two Charts Simultaneously'
\ Color	To select the color of plotting and displaying objects on the user charts:	3.8.1	'Making Manual Updates'
	- updating color;	3.8.2	'Creating User Charts'
	- color selected from the offered palette	3.8.3	'Editing User Charts'
\Graphic editor	To provide access to the functions used for work with the graphic editor for creating and editing user charts		
\\ Add a new object	To display a selection of objects for plotting on the user chart		
	To plot the following objects on the user chart:	3.8.1	'Making Manual Updates'
\\\ Symbols	- navigational symbols;	3.8.2	"Creating User Charts'
\\\ External	- additional (own) symbols;		
\\\ Depths	- soundings;		
\\\ Lights	- lights;		
\\\ Buoys	- buoys;		
\\\ Racons	- racons:		
\\\ Lines	- lines and zones;		
\\\ Guard zones	- guard zones:		

\\\ Dangers	- symbols of dangers to navigation;		
\\\ Text	- texts on the chart;		
\\\ Information	- texts stored under "i" symbol;		
\\\ Canceling by hand	- cross-out symbol (when making updates)		
\\ Edit Info	To enter information stored on the user chart under a symbol of any objects plotted on it and to edit such information	3.8.1	'Making Manual Updates'
		3.8.2	'Creating User Charts'
		3.8.3	'Editing User Charts'
	To edit objects plotted on the user charts in the following manner:	3.8.1	'Making Manual Updates'
		3.8.3	'Editing User Charts'
\\ Edit object	- to edit texts, lines and zones;		
\\ Delete object	- to remove objects (with a reconstruction option)		
\\ Shift object	- to shift an object;		
\\ Shift all object	- to shift all the objects on the user chart		
\\ Merge charts	To duplicate data contained on a user chart onto another user chart	3.8.4	'Presentation of Objects on the User Charts and Work with Two User Charts'
\ User chart list	To load a previously created and saved user chart in the NS	3.8.1	'Making Manual Updates'
		3.8.3	'Editing User Charts'
		3.8.4	'Presentation of Objects on the User Charts and Work with Two Charts Simultaneously'
\ Unload active chart	To unload a user chart from the NS	3.8.1	'Making Manual Updates'
		3.8.2	'Creating User Charts'
		3.8.3	'Editing User Charts'

\ Save active chart	To save a created or edited user chart	3.8.1	'Making Manual Updates'
		3.8.2	'Creating User Charts'
		3.8.3	'Editing User Charts'
		3.8.4	'Presentation of Objects on the User Charts and Work with Two Charts Simultaneously"
\ Information layers	To provide access to the functions used for turning on/off the display of individual classes of chart information on the user chart		
\\ All information	To turn on the facility for plotting and displaying all the user chart objects	3.8.2	'Creating User Charts'
		3.8.3	'Editing User Charts'
	To turn on/off the display of the following objects on the user chart:	3.8.4	'Presentation of Objects on the User Charts and Work with User Charts Simultaneously'
\\ Symbols	- navigational symbols;		
\\ Depths	- soundings;		
\\ Lights	- lights;		
\\ Buoys	- buoys;		
\\ Racons	- racons;		
\\ Lines	- lines and zones;		
\\ Guard zones	- guard zones;		
\\ Dangers	- symbols of dangers to navigation;		
\\ Text	- texts on the chart;		
\\Info	- "i" symbol storing the information;		
\\ Canceling by hand	- cross-out symbols (in making the updates)		
\ Show deleted	To turn on/off the display of deleted objects (in a special color)	3.8.3	'Editing User Charts'

\Move to Active chart	To re-construct the objects deleted from the user chart	3.8.3	"Editing User Charts'
\Equalize data*	To "equalize" data on the user charts stored in the Master and Slave stations	3.8.5	'Networking Information on the User Charts'

Note: the function marked with (asterisk) appears in ROUTE function submenu only in case of network operation (see "Technical Reference" and "Utilities" documents).*

4.2.10 ERBL

1	2	3	4
ERBL	To turn on the NS ERBL (Electronic Range and Bearing Line)	3.3.5 item 4	'Obtaining Additional Information During the NS Operation in the Voyage Monitoring Mode'

4.2.11 Alarm

1	2	3	4
ALARM	To provide access to the functions used for alarm setting		
\ Sound	To turn on/off audible alarm	3.1.2 item 4	'Initial Parameter Input'
\ Set Timer	To set the timer (for the alarm to be triggered off upon the expiry of time set by this function)	3.3.4 item 5	'Auxiliary NS Facilities Used in the Voyage Monitoring Mode'
\ Watch	To set the value of time before the end of watch when an alarm is to be triggered off	3.1.2 item 4	'Initial Parameter Input'
\ Off chart	To turn on/off triggering of an alarm as the vessel is sailing out of the current chart limits with Chart Autoload mode off	3.1.2 item 4	'Initial Parameter Input'

\ Off route	To turn on/off triggering of an alarm as the vessel is sailing beyond the route after passing its last WP	3.7.8	'Alarm Settings in Sailing along the Route'
\WPT	To set the advance time for triggering off the alarm as the vessel is approaching a WP	3.7.8	'Alarm Settings in Sailing along the Route'
	To turn on/off triggering of an alarm as the vessel is proceeding along the route in the following cases:	3.7.8	'Alarm Settings in Sailing along the Route'
\ Course	- deviation of the current course from that set in the planned route exceeds the value set by this function;		
\XTE	- XTE exceeds the value set in the route data table;		
\ Schedule control	- deviation from the voyage schedule exceeds the value set by this function		
\ DGPS loss	To turn on/off triggering of an alarm when the duration of DGPS differential mode loss exceeds that set by this function	3.2.1 items 1 and 2	'Selecting the Positioning System'
\ Pos control	To turn on/off triggering of an alarm when the distance between the primary and secondary positions exceeds the value set by this function	3.2.1 items 1 and 2	'Selecting the Positioning System'
\ Least depth	To turn on/off triggering of an alarm when the current depth from the sounder is less than that set by this function	3.2.1 items 4	'Initial Parameter Input'
	To turn on/off triggering of an alarm during the work with radar targets in the following cases:	3.5.1	'Setting the Alarms in Work with ARPA'

\CPA	- violation of limitation on the closest distance of approach to a radar target;		
\TCPA	- violation of limitation on time to the moment of closest approach to a radar target set by this function		
	To turn on/off triggering of an alarm in the Voyage Monitoring Mode in the following cases:	3.3.2	'Setting the Alarms in Voyage Monitoring Mode'
\ Guard zone	- crossing of a guard zone plotted on the user chart;		
\ Danger	- approach to an isolated danger to navigation at a distance less than that set by this function		
\ Sf. contour time	To set the advance time for triggering of an alarm as the vessel is approaching a safety contour	3.3.2	'Setting the Alarms in Voyage Monitoring Mode'
\TIME	To set the advance time for triggering of an alarm as the vessel is approaching a special purpose area	3.3.2	"Setting the Alarms in Voyage Monitoring Mode'
\ (type of a special purpose area)*	To turn on/off triggering of an alarm in the Voyage Monitoring Mode when a special purpose area is crossed	3.3.2	'Setting the Alarms in Voyage Monitoring Mode'

ALARM submenu functions combined in a group of special purpose areas (the group is marked with) are listed in "Alarm Messages on the Approach to the Special Purpose Areas".*

4.2.12 Event

1	2	3	4
EVENT	To make an instant compulsory entry in the electronic ship's log	3.9.2 item 2	'Keeping a Ship's Log'

4.2.13 Task

1	2	3	4
TASK	To provide access to the functions used for navigational calculations		
\ WP ETA	To calculate ETA in the set WP from the current vessel position	3.10.1	'Calculating Estimated Time of Arrival (ETA)'
\ WP STG	To calculate the speed to go on the route and time of arrival in the position for changing the engine setting for arriving in the point at the preset ETA	3.10.2	'Calculations of Speed To Go'
\WIND	To calculate true wind parameters from the measured relative wind parameters	3.10.3	'True Wind Calculations'
\PORT	To provide access to the functions used for obtaining brief port information		
	To work with the database on ports and performing the following operations on this database:	3.10.4	'Obtaining Information on Ports'
\\ Load	- loading into RAM;		
\\ Unload	- unloading		
	To select (search for) the port of interest in the following ways:	3.10.4	'Obtaining Information on Ports'
\\ By name..	- by the port name;		

\\ By region..	- by the area;		
\\ By country..	- by the name of the country;		
\\ By cursor..	- by the cursor position		
\\ Screen ON/OFF	To display information on the port, provided during the most recent access to the function	3.10.4	'Obtaining Information on Ports'
\\ Units	To select the measurement units for depths and heights in the information provided on the selected port: - in metres; - in feet	3.10.4	'Obtaining Information on Ports'
\ OBJECT	To turn on/off the tracking of an object (obtaining information on the changes of range and bearing to any fixed point)	3.3.4 item 4	'Auxiliary NS Facilities Used in the Voyage Monitoring Mode'
\VPLAN	To provide access to the functions for creating a voyage schedule		
\\ Voyage plan table	To switch the cursor to the voyage schedule table for the data input and editing	3.7.5	'Creating a Schedule of the Vessel's Motion along the Route'
		3.7.6 item 2	"Editing a Previously Created Schedule'
\\ Check table	To turn on the check of entered of edited data in a voyage schedule table	3.7.5	"Creating a Schedule of the Vessel's Motion along the Route'
		3.7.6 item 2	"Editing a Previously Created Schedule'
\\ Calculation	To turn on voyage schedule calculations after the input of all the required data in the voyage schedule table	3.7.5	'Creating a Schedule of the Vessel's Motion along the Route'
		3.7.6 item 2	'Editing a Previously Created Schedule'
\\ Print table	To print out a created or edited schedule in the voyage schedule table	3.7.5	"Creating a Schedule of the Vessel's Motion along the Route'

		3.7.6 item 2	'Editing a Previously Created Schedule'
\\ Remove results	To reset the calculation results in the voyage schedule table for editing the entered data	3.7.6 item 2	'Editing a Previously Created Schedule'
\\ Clear table	To reset the input data and calculation results in the voyage schedule table for creating a new voyage schedule for the loaded route	3.7.6 item 1	'Editing a Previously Created Schedule'
\\ Choose route	To load a route in order:		
	- to create a schedule for proceeding along this route;	3.7.5	'Creating a Schedule of the Vessel's Motion along the Route'
	- to edit an already existing schedule of proceeding along this route;	3.7.6 item 2	'Editing a Previously Created Schedule'
	- monitoring the fulfillment of a voyage schedule created for the given route in the Voyage Monitoring Mode	3.7.7	'Loading of and Work with a Route and Voyage Schedule in the Voyage Monitoring Mode'
\\ Load voyage	To load a previously created and saved voyage schedule in order:		
	- to edit it;	3.7.6 item 2	'Editing a Previously Created Schedule'
	- to monitor its fulfillment as the vessel is proceeding along the route in the Voyage Monitoring Mode	3.7.7	'Loading of and Work with a Route and Voyage Schedule in the Voyage Monitoring Mode'
\\ Unload voyage	To unload a created and saved voyage schedule:		
	- after its has been created;	3.7.5	'Creating a Schedule of the Vessel's Motion along the Route'

	- after editing;	3.7.6 item 2	'Editing a Previously Created Schedule'
	- when there is no need to monitor the way it is followed;	3.7.7	'Loading of and Work with a Route and Voyage Schedule in the Voyage Monitoring Mode'
\\ Save voyage	To save a created or edited voyage schedule	3.7.5 3.7.6 item 2	'Creating a Schedule of the Vessel's Motion along the Route' 'Editing a Previously Created Schedule'
\\ Delete voyage	To delete a previously created and saved voyage schedule		
\\ Current	To take/not to take into account the effect of currents during the voyage schedule calculations	3.7.5	'Creating a Schedule of the Vessel's Motion along the Route'
\TIDE	To provide access to the functions used for obtaining information on the tides		
	To work with the database on tides and perform the following operations on this database:	3.10.5 items 1 and 2	'Obtaining Information on Currents'
\\ Load	- loading into RAM;		
\\ Unload	- unloading		
	To select (search for) the required reference point in the following ways:	3.10.5 item 2	'Obtaining Information on Currents'
\\ By name…	- by the name of the point;		
\\ By cursor…	- by the cursor position		
\\ Screen ON/OFF	To display the information on tides supplied during the most recent application to the function	3.10.5 item 2	'Obtaining Information on Currents'

\\ Nearest place	To determine the closest reference point which the tidal information for the current vessel position was taken from	3.10.5 item 1	'Obtaining information on Currents'
\\ Units	To select measurement units for tidal rise in the provided information: - in meter; - in feet	3.10.5 item 2	'Obtaining Information on Currents'
\\ Time	To select the time count off system which the tidal curve will be shown in: - local time; - ship's time	3.10.5 item 2	'Obtaining Information on Currents'
\ Current	To provide access to the function used for obtaining information on the tidal and surface currents		
	To work with the database on currents and perform the following operations on this database:	3.10.6 items 1 and 2	'Obtaining Information on Currents'
\\ Load	- loading into RAM;		
\\ Unload	- unloading		
\\ By hour…	To view the dynamics of changes in the current acting in the selected chart fragment hour-by-hour	3.10.6 item 2	'Obtaining Information on Currents'
\\ By month…	To view the dynamics of changes in the current acting in the selected chart fragment month-by-month	3.10.6 item 2	'Obtaining Information on Currents'

4.2.14 LogBook

1	2	3	4
LOGBOOK	To provide access to the function used for work with the electronic ship's log and with functions setting the parameters for the vessel track display		
\ View log book	To view the electronic ship's log and enter one's own comments	3.9.1	Viewing and Printing Out the Ship's Log'
		3.9.2 item 2	'Keeping a Ship's Log'
		3.9.3	Viewing Archive Data'
\ Track history	To load the vessel's track recording as of the date required to be viewed	3.9.3	Viewing Archive Data'
\ Set time zone	To change the ship's time in accordance with the time zone change	3.1.2 item 5	'Initial Parameter Input'
\ Watch organization	To set the ship watch relief time	3.1.2 item 3	'Initial Parameter Input'
\ Track color	To select the color for the display of the ownship's track	3.3.3	'Settings for the NS Operation in the Navigation Mode'
\ Track precision	To select the plotting time for the ownship's track display:	3.9.3	Viewing Archive Data"
	- 1 minute;		
	- 10 seconds		
\ Own ship track	To determine the length of the track left by the vessel over a set time interval	3.3.3	'Settings for the NS Operation in the Navigation Mode'
\ Routing INFO entry	To set the minimum time interval for the periodic recording of the vessel position in the ship's log	3.9.2 item 3	"Keeping a Ship's Log'

\ Print Log Book	To print out the electronic ship's log	3.9.1	Viewing and Printing Out the Ship's Log'
\ Reset distance	To reset (set to zero) the distance accumulated in the ship's log (to start a new voyage)	3.9.2 item 4	"Keeping a Ship's Log'
\ Log View Filter	To turn on/off the display (in the ship's log table) of a group of events required to be viewed and printed out	3.9.1	Viewing and Printing Out the Ship's Log'
		3.9.2 item 2	'Keeping a Ship's Log'

4.2.15 ARPA

1	2	3	4
ARPA	To provide access to the functions used for work with ARPA, radar and trial maneuver		
\ Target table view	To display the table of targets containing the parameters of all the targets acquired by ARPA and shown on the NS screen	3.5.2	'Work with Radar Targets'
\ Target tracks	To turn on/off the display of radar target "trails"	3.5.2	'Work with Radar Targets'
\ Vectors	To set the vector length for the radar targets and ownship	3.5.2	'Work with Radar Targets'
\ ARPA Info	To turn on/off the radar display on the NS screen	3.2.3 items 1 and 2	'Correcting the Vessel Position Using ARPA Information'
		3.5.2	'Work with Radar Targets'
		3.5.3 items 1 and 2	'Display of ARPA Cursor, ERBL and Screen'
		3.5.4	'Saving Radar Targets' Tracks'

		3.6.2	'Trial Maneuver for Avoiding Collision with Other Vessels'
\ Recording	To turn on/off the recording of radar targets; tracks in the archive day-by-day files	3.5.4	"Saving Radar Targets' Tracks'
	To turn on/off the display of the following ARPA facilities on the NS screen:	3.2.3 item 2	'Correcting the Vessel Position Using ARPA Information'
\ ARPA cursor	- cursor;	3.5.3 item 1	'Display of ARPA Cursor, ERBL and Screen'
\ ARPA ERBI	- ERBI		
\ Ship's model	To provide access to the functions used for preparation to the trial maneuver		
\\ List of models	To load the ownship's mathematical model used for calculating motion on the turning circle and trial speed maneuver	3.6.1	'Trial Maneuver for Steering to the Next Route Segment'
		3.6.2	'Trial Maneuver for Avoiding Collision with Other Vessels'
		3.6.3	'Simulation Trial Maneuver'
		3.7.1	'Route Planning on the Electronic Chart'
		3.7.3 item 1	'Transferring a Planned Route from the Paper Chart'
\\ Unload model	To unload the ownship's mathematical model from RAM		
\\ Trial line along	To take/not to take the drift effect into account in the trial maneuver	3.6.1	'Trial Maneuver for Steering to the Next Route Segment'
		3.6.2	"Trial Maneuver for Avoiding Collision with Other Vessels'

\ Cancel trial man.	To exit from the trial maneuver mode	3.6.1	'Trial Maneuver for Steering to the Next
		3.6.2	'Trial Maneuver for Avoiding Collision with Other Vessels'
\ Trial maneuver (see Note)	To provide access to the functions in the maneuver parameter input window and used for a trial maneuver	3.6.1	'Trial Maneuver for Steering to the Next Route Segment'
		3.6.2	'Trial Maneuver for Avoiding Collision with Other Vessels'
		3.6.3	'Simulation Trial Maneuver'
\\ Rudder angle	To set the rudder angle which is used for calculating the shape of a curvilinear trajectory of the vessel's motion on the turning circle	3.6.1	'Trial Maneuver for Steering to the Next Route Segment'
		3.6.2	'Trial Maneuver for Avoiding Collision with Other Vessels'
		3.7.1	'Route Planning on the Electronic Chart'

Note: ARPA\Trial maneuver submenu functions combined in the maneuver parameter input window are listed in "Trial Maneuver for Avoiding Collision with Other Vessels" of the "User Manual", where their purpose is also stated.

4.2.16 Help

1	2	3	4
HELP	To obtain information on the NS operation	5.3	'Obtaining Information on Work with the NS'

4.2.17 Config

1	2	3	4
CONFIG	To provide access to the functions used for the initial NS settings, as well as for obtaining additional information in the process of the NS operation		
\ Display color set	To select the screen color palettes (to suit the time of the day)	3.3.3	'Settings for the NS Operation in the Navigation Mode'
\ Display	To select one of the 4 display types in the NS Information Area with the following data presented:	3.6.1	'Trial Maneuver for Steering to the Next Route Segment'
	- sailing conditions (System);	3.7.7	'Loading of and Work with a Route and Voyage Schedule in the Voyage Monitoring Mode'
	- vessel position on the route (Route);		
	- vessel position relative to the current WP in accordance with the loaded voyage schedule data (Pilot); - weather conditions (Weather)	3.10.5 3.10.6	"Obtaining Information on Tides' 'Obtaining Information on Currents'
\ Cursor	To select the type of the Graphics cursor display	2.3.5	'Graphics Cursor'
\ Precision	To select the precision of the current vessel position coordinates displayed in the NS Information Area	3.3.5 item 3	'Obtaining Additional Information During the NS Operation in the Voyage Monitoring Mode'
\ Monitor	To set the monitor's active area dimensions (diagonally in mm)	3.1.2 item 2	'Initial Parameter Input'

	To turn on/off the mode of permanently displaying Help information on the NS main menu functions (when the cursor is positioned on the,) in the following	5.3 item 2 and 3	'Obtaining Information on Work with the NS'
\ Help mode	- window wit information in the bottom part of the NS screen;		
\ Prompt mode	- brief information in a line		
\ Own ship setup	To provide access to the functions used for the input of ownship parameters and initial settings required in the process of the NS operation		
	To set the following ownship's maximum dimensions:	3.1.2 item 2	'Initial Parameter Input'
\\ Length overall	- maximum length;		
\\ Beam overall	- maximum breadth		
	To enter the positions of the following objects (in the vessel's system of coordinates):	3.1.2 item 2	'Initial Parameter Input'
\\ Conning st. X	- coordinates of the system's central display;		
\\ Conning st. Y			
\\ PS1 ant X	- coordinates of No 1		
\\PS1 antY	positioning system antenna;		
\\ PS2 ant X	- coordinates of No 2		
\\ PS2 ant Y	positioning system antenna;		
\\ ARPA A ant X	- coordinates of the main		
\\ ARPA A ant Y	ARPA antenna;		
\\ ARPA B ant X	- coordinates of the second		
\\ ARPA B ant Y	ARPA antenna;		
\\ Bridge elevation	To enter the height of the navigation bridge	3.1.2 item 1	'Initial Parameter Input'

\\ COG vector \\ HDG vector	To turn on/off the display of vectors originating in the ownship symbol: - vector of motion over the ground (COG); motion vector according to the gyro and log readings (HDG)	3.1.2 item 1	'Initial Parameter Input'
\\ Ship by	To set the vessel symbol displayed on the NS screen: - shaped as its contour; - shaped as two concentric circles	3.1.2 item 1	'Initial Parameter Input'
\\ Align contour on	To bring the vessel's centreline plane orientation in alignment with one of possible vectors: - COG; - HDG	3.1.2 item 1	'Initial Parameter Input'
\\ Display reset to	To determine the limits of the screen displayed ahead of the vessel (when the NS is operating in the Navigation Mode). When the vessel reaches this limit the screen is automatically re-drawn	3.1.2 item 1	'Initial Parameter Input'
\ NMEA output setup	To determine the types and format of sentences output by the NS to the external devices		(see "Technical Reference")
\ Hardware setup	To set the multiport board		(see "Technical Reference")
\ Set a new password	To change the system password		(by default the following password is set: TRANSAS+ <space>)
\ Monitoring port	To view digital messages received from or transmitted to the external output devices connected to the NS	3.1.1	'Running the NS and Turning It Off

\ Comm. Ports Trace	To record in a special file digital messages received from all the external output devices,		(see "Copy Registration for the Warranty Servicing" of the "Technical Reference")
\ Primary status info	To obtain fuller information on the quality of positioning by GPS on the primary track	3.3.5 item 2	'Obtaining Additional Information During the NS Operation in the Voyage Monitoring Mode'
\ License info	To obtain information on the license to use NaviSailor software	3.1.1	'Running the NS and Turning It Off
\ Select ARPA type	To set the type of ARPA interfaced with the NS		(see "Technical Reference")
\ Attach sensors	To connect the navigational sensors		(see "Technical Reference")
\Exit	To turn the NS off	3.1.1	'Running the NS and Turning It Off

5 ANNEX

5.1 Alarm Messages and Recommended Actions

As the vessel sails beyond the set limits an alarm is triggered off

To disable an audible signal and alarm message displayed in the 'NS Information Area" when an alarm is generated, press ALARM function key in the NS main menu or <Alt>+ <Esc> hot keys on the Keyboard As this is done, the alarm message disappears from the second line of the Information Area, whilst the function in ALARM submenu handling this signal continues to be highlighted in the orange color until the involved parameter is back within the set limits, or until this function is deliberately turned off. If the alarm is connected with limitations on the vessel motion parameters, in the information area such parameter is highlighted in the orange color.

The following alarm messages may appear in the process of NS operation:

Alarm message	Meaning	Recommended actions and reference to the appropriate chapters of the "User Manual"
1	2	3
Printer OFF	The printer is switched off or in the Off Line position	
TIMER	The time set by the timer has expired	
End of Watch	End of the watch	
OFF CHART	The vessel is beyond the chart limit with the chart autoload mode is switched off	Load the chart under the vessel's position (see 'Automatic Chart Loading', 'Loading Charts Required by the User')
OFF ROUTE	The vessel has passed the last WP of the route loaded in the Voyage Monitoring Mode"	Unload the route in question from the NS (see 'Loading of and Work with Route and Voyage Schedule in the Voyage Monitoring Mode')

Waypoint Appr.	The vessel has approached the WP	
OFF COURSE	Deviation from the plotted course	Ascertain that the course set in the autopilot is correct
XTE Exceeded	Set XTE value exceeded	ascertain that the course set in the autopilot is correct
PRIMARY (SECONDARY) UNREL. POSITION	Unreliable primary (secondary) vessel position fixing	CONFIG\Primary status info to identify the cause of unreliable position fixing for the primary track (see 'Obtaining Additional Information during the NS Operation in the Voyage Monitoring Mode')
CPA/TCPA	CPA and TCPA are less than those set;	Pay attention to the dangerous radar target (see 'Work with Radar Targets')
PRIM. (SEC.) DIFF. MODE LOSS	Loss of differential positioning mode for a time exceeding the set value	
	The NS does not receive data from the external output devices:	Check the operation and connection of the relevant navigational sensor
SOUNDER FAILURE	Sounder;	(see "Technical Reference")
LOG FAILURE	Log;	
COMPASS FAILURE	Gyro compass;	
PRIMARY (SECONDARY) FAILURE	Primary (secondary) positioning system;	
Drift FAILURE	Drift sensor;	
Wind FAILURE	Wind sensor;	
Temperature FAILURE	Water temperature sensor;	

Time FAILURE	Time sensor	
TIME ZONE	Change of the ship's time	Ascertain that the ship's time has been set correctly
MANEUVER	30 seconds before the start of the intended maneuver	
CRS-SFC: 20 mA 1324	The vessel is crossing 20 m safety contour found on chart A 1324	
NETWORK NOCONNECT	The station is operating in SLAVE mode and does not receive signals from the MASTER	Check the MASTER station's operation (see "Utilities" document)
NETWORK RECONFIG	The station which operated as the hot backup for the master station has automatically switched to the loss of communication with the master	(see "Utilities" document)
CHECK POS-HDG-LOG	Immediately after the NS start DR mode is set	Check the vessel's position and motion parameters
ECHO REF. LOSS	Loss of reference target for determining the position by an object acquired by ARPA	Re-set ER positioning mode or set some other vessel positioning method (see 'Selecting the Positioning System ')
AHEAD OF THE SCHEDULE	The vessel is ahead of the schedule	
BEHIND THE SCHEDULE	The vessel is behind the schedule	
SAFE CONTOUR CHANGE	When a set of charts under the vessel's position is changes, the previously selected safety contour on these charts become unavailable	-

AG MONITORING OFF	In the changed set of charts under the vessel's position there is no vector chart on a scale larger than the setting in SHIP\ Scale function, which means loss of monitoring of safety at sea	Set the scale value in SHIP\Scale function appropriate to the available collection (see 'Setting the Parameters for Monitoring the Safety at Sea')

5.2 Alarm Messages on the Approach to the Special Purpose Areas

In accordance with ECDIS standard the NS has alarms which are triggered off when the vessel's symbols approaches areas and limit lines plotted on the vector electronic chart. In addition to the areas compulsory for alarm generation, approach to a whole group of additional areas is monitored. These areas are combined in ADDITIONAL AREAS section of *ALARM* function

When an alarm is triggered off, an appropriate alarm message is displayed in the second line of the NS Information Area, whilst the ALARM submenu function, which handles this signal, will be highlighted in the orange color.

1. A list of AREAS monitored in compliance with ECDIS standard

MESSAGE	MEANING
Traff. Separ. Zone	Traffic Separation Zone
Traff. Crossing	Traffic Routing Scheme Crossing
Traff. Roundabout	Traffic Routing Scheme Roundabout
Traff Prec. Area	Traffic Routing Scheme Precautionary Area
Two-way Tr. Route	Two-way Traffic Route
Deepwater Route	Deepwater Route Recomm.
Recomm. Tr. Lane	Recommended Traffic Lane Inshore
Inshore Tr. Zone	Inshore Traffic Zone
Fairway	Fairway
Restricted Area	Restricted Area

Caution Area	Caution Area
Offsh. Prod. Area	Offshore Production Area
Areas To Avoid	Areas To Be Avoided
Military Area	Military Practice Area
Seaplane Landing	Seaplane Landing Area
Submarine Transit	Submarine Transit Lane
Ice Area	Ice Area
Channel	Channel
Fishing Ground	Fishing Ground
Fishing Prohibited	Fishing Prohibited
Pipeline Area	Pipeline Area
Cable Area	Cable Area
Anchorage Area	Anchorage Area
Anchor. Prohibited	Anchorage Prohibited
Dumping Ground	Dumping Ground
Spoil Ground	Spoil Ground
Dredged Area	Dredged Area
Cargo Transhipp.	Cargo Transshipment Area
Incineration Area	Incineration Area
Special Protection	Specially Protected Area

2. ADDITIONAL AREAS which alarms are implemented for:

MESSAGE	MEANING
Int. Mar. Boundary	International Maritime Boundary
Terr. Sea Base Line	Straight Territorial Sea Base Line
Terr. Sea	Territorial Sea
Prohibited Area	Prohibited Area
Quarant. Anchorage	Quarantine Anchorage
Fishery Zone	Fishery Zone
Swept Area	Swept Area
Excl. Econ. Zone	Limit of Exclusive Economic Zone
Harbour Limit	Harbour Limit
Unsurveyed Area	Unsurveyed Area

Explosiv. Dump.	Explosives Dumping Ground
Danger Line	Danger Line
Nature Reserve	Limit of Nature Reserve

5.3 Obtaining Information on Work with the NS

The NS has a facility for obtaining context dependent help for each function. Such information is displayed in a window in the bottom part of the screen and contains:

- short statement of the function's purpose;
- list of sections where this function is involved; or
- contents of this function's submenu.

Each highlighted (in the orange color) key word, which is actually a reference to the chapter of the "User Manual", enables the user to receive some additional information on the issue the user may be interested in. It is then possible to return to the previous text

To view and leaf through the text in the window use the Trackerball or cursor control keys and <PgUp>, <PgDn>, <Home>, <End> keys on the Keyboard.

There are several ways to receive such information:

1. To receive information on the purpose and use of a particular NS function occasionally as required:

1	2	3
Position the cursor on the NS function which information is required to be obtained on	<F1>	The bottom part of the NS screen displays an information window containing information described above
If any additional information is required on the issue which is being considered, you can use highlighted reference words	<Enter>	The window displays information on the section appropriate to the selected key word

Return to the previous information	<Alt>+ <H> (or press the right mouse button)	And so on, until all the required information is obtained
	<Esc>	To remove the window from the NS screen

2. To view information in the background mode whereby the screen permanently displays a HELP window with data referring to that NS currently under the cursor.

1	2	3
CONFIG\Help mode	ON	To turn on the background mode of obtaining information on work with the NS
	OFF	To turn off this mode

3. To obtain brief information on the purpose of the NS functions in the bottom line of the screen as the cursor is going through the menu

1	2	3
CONFIG\Prompt mode	ON	To display a line describing briefly the purpose of the function currently under the cursor
	OFF	To turn off the display of such line

5.4 Specific Features of Using ARCS Format Charts

5.4.1 ARCS mode

In this mode UK HO ARCS SPECIFICATIONS standards and requirements are strictly complied with. As some of the characteristics

of ARCS chart display do not conform with ECDIS standards and requirements which TRANSAS does its utmost to strictly comply with, some additional limitations have been introduced in the NS software.

To turn on this mode, in CHART\PRIORITY function select "ARCS" option by pressing <Enter> key. "ARCS MODE" message is displayed in the top part of the Information Area.

Navigational Information Beyond the Limits of Charts Using Projections Other Than Mercator

UKHO ARCS SPECIFICATIONS rule out the plotting of any navigational information referenced to the geographic coordinates beyond the chart limits when using charts in projections other than Mercator.

As a *result some information, i. e. user created routes, additional user information (ADD INFO function), ARPA targets and transponder objects, can only be shown where it overlays an ARCS charts image. User should be aware of this when sailing in the vicinity of chart limits, they should regularly display overlapping or smaller scale charts to maintain knowledge of the complete navigational picture.*

The Leading Chart

The leading chart is understood as a chart displayed on the screen upon which the current vessel's position is overlaid.

Navigation Mode

In the navigation mode (monitoring of the vessel's position on the chart) for the leading chart an ARCS chart is always selected which is in this case displayed on its original scale. The numeric value of this scale may generally differ from the paper chart scale in a proportion, which is determined by the resolution of a specific display and calculated by the NS.

Chart Viewing Mode

In cases when there is no direct monitoring of the vessel's position, e. g., in the review and selection of charts *(REVIEW* function) and/or when the vessel symbol is removed from the screen (<Delete> key), the NS functions become somewhat more extensive:

- charts are selected from both, ARCS collection and out of charts in other formats if their scale is more suitable in this specific case;
- the display scale can be changed by the user, the scale cannot, however, be increased by more than two times;
- if necessary the projection of the viewed charts can be transformed to Mercator allowing charts on different projections to be joined. If the ARCS chart has been re-projected by THE NS then the legend 'ARCS IMG TRANSFORM' is shown (see appropriate item of "Utilities" manual).

Chart Multi-Loading

If the leading chart's projection is other than Mercator, it is generally impossible to use the system developed by TRANSAS for simultaneous loading of several (up to six) electronic charts onto the screen (multi-loading). In this case the program switches on SINGLE CHART MODE, an appropriate indication is displayed in the bottom part of the Information Area.

In other cases multi-loading is only possible for ARCS charts on the same scale as that of the leading chart, as well as for other (non ARCS) charts.

Information on the Navigational Objects

The NS implements a mode for obtaining information on individual electronic chart objects *(INFO* function), which cannot be obtained from raster charts. This relates, specifically, to the information on the specifications of lighthouses and buoys, isolated dangers, on the conventional signs used on the chart, etc. To obtain this information switch on *CHART\Raster Chart Info* function.

The NS selects the information from TRANSAS vector chart databases, but only in that case when there is a vector chart with the same number and scale as those of the displayed ARCS chart.

When this option is being activated the functions of automatic alarm on the approach to dangers, limits of special areas and specified depth contours implemented in the NS, and based on the use of TRANSAS vector chart databases, must be considered as those based on the information which is unofficial in relation to UKHO charts.

The UK Hydrographic Office (UKHO - supplier of the ARCS chart data and the British Admiralty chart on which it is based) wishes to alert users to the potential problems associated with this mode of operation especially in the use of automatic alarms. The UKHO bears no responsibility for any incidents arising from this mode of operation.

Tables and Additional Warnings

Additional information arranged in the title part and on the free surfaces of ARCS raster charts within the chart limits, is partly duplicated in the NS operation with *TRANSAS MARINE (UK) LTD.'s* own databases (tables for calculating currents are in the graphic form). This information can normally be viewed in the chart review mode using REVIEW function.

Future the NS programs will be capable of the coordinated use of a raster chart display in combination with various databases in addition to those, which are used now.

Use CHART\REVIEW ARCS CHART function for viewing the entire surface of raster charts (including margins beyond the chart limits). When this function is switched on an ARCS chart is displayed on its original scale only, without any additional information (routes, targets, etc.).

5.4.2 Specific Features of Using ARCS Charts in "ECS MODE"

To switch on this mode select ECS option in *CHART\Priority* function.

In this mode, which is an ordinary NS 2400 operation mode, all the charts in the collection, in any format have the same priority with respect to their use.

ARCS charts in this case as considered to be a specific variation of electronic charts for which some of the operations performed by the NS were subject to certain modification in compliance with the requirements of UKHO ARCS SPECIFICATIONS.

Chart Loading. Multi-loading

In the navigation mode (monitoring of the vessel's position on the chart) any chart from the collection whose scale best suits the user's settings can be taken as the leading chart.

The full-scale multi-loading of charts is implemented (item 2. 5), including charts differing in their original scale, the latter being re-scaled. It should be noted that ARCS chart scale is not allowed to be increased by more than twice.

Transformation of Chart Projections

Charts made in different projections are transformed by the NS into Mercator projection (WGS-84 Datum) in accordance with ECDIS requirements. In compliance with UKHO ARCS SPECIFICATIONS requirement in case of ARCS chart transformation an alarm warning is displayed: "ARCS IMG. TRANSFORM".

In this case, if the displayed chart projection is other than Mercator, it is so transformed that the error in the chart element display should not exceed one pixel (in the worst possible case of such transformation for one chart only, N3762, the maximum linear error in displaying individual elements will be equal to ten metres).

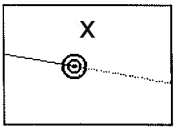
Such transformation may slightly reduce the clarity of the ARCS image.

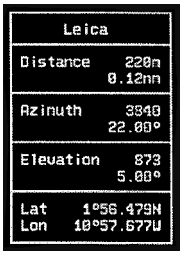
5.5 Work with LEICA Vector 1500 DAE/DAES Binoculars

When operating with this type of binoculars connected, the NS allows the following data to be received and displayed in the information window:

- bearing from the ownship to an object (in the measurement units equal to 1/10, 000 of a radian and in degrees);
- object's range (in meters and miles);
- object's elevation over the horizon (in the measurement units equal to 1/10, 000 of a radian and in degrees);
- in addition, the object's calculated coordinates are displayed and its symbol presented on the NS screen.

To display the object's symbol and window with the above information on the NS screen, use the following procedure:





Check the connection of and reception of data from the binoculars	<Alt>+ <N>	The NS screen displays the object's position as a cross (see fig.)
	<Alt>+ <M>	A window with data received from the binoculars appears in the Information Area (see fig.)
	<Esc>	To remove the window from the NS Information Area

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