AKADEMIA MORSKA
W SZCZECINIE

Centrum Inżynierii Ruchu Morskiego
Marine Traffic Engineering Centre

Instrukcja nr 0

Obsługa urządzeń nawigacyjnych w symulatorze manewrowym CIRM typu Polaris™
Operation of navigation equipment in Polaris™ ship's manoeuvring simulator of MTEC

Szczecin 2008

Zespół wykonawczy:
Prepared by:

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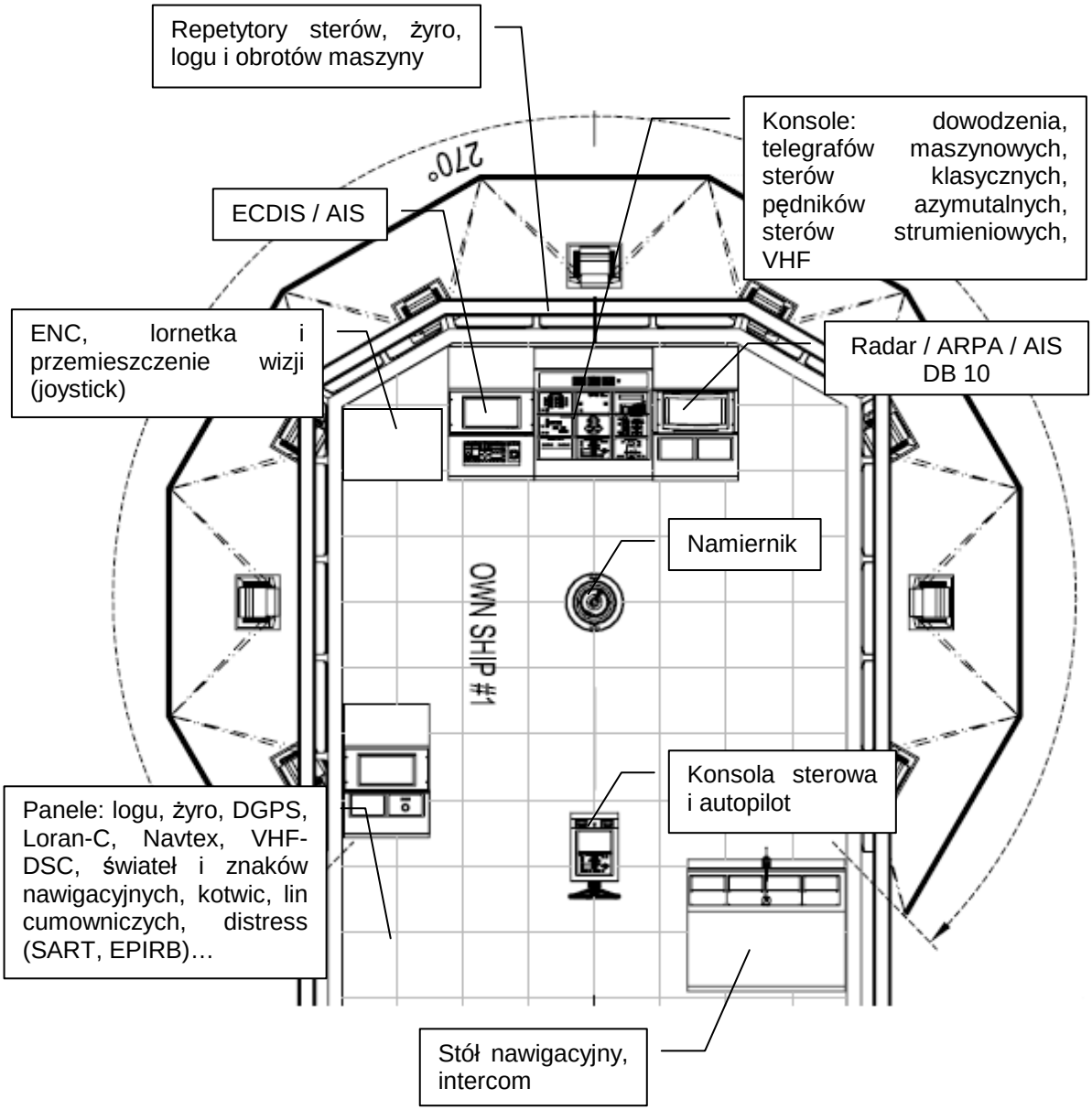
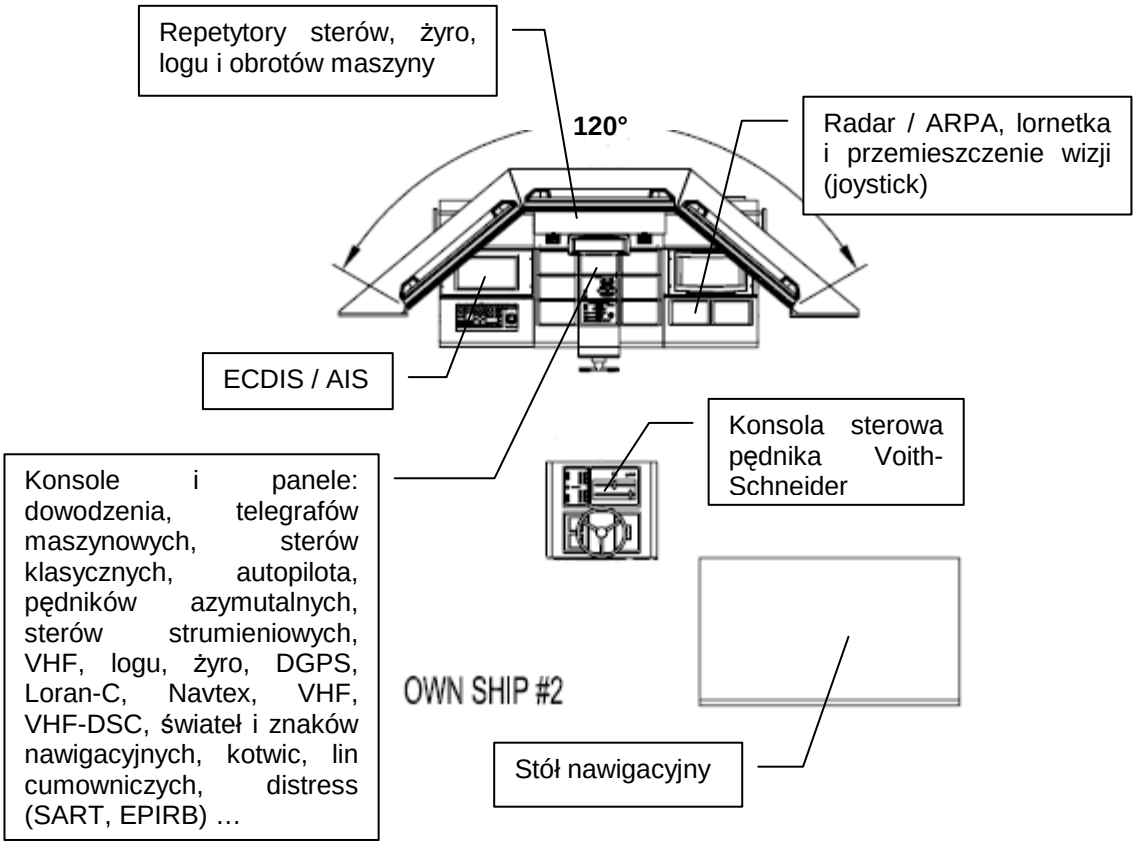
1. Rozmieszczenie urządzeń nawigacyjnych w symulatorze manewrowym CIRM. *Layout of navigation equipment in MTEC ship's manoeuvring simulator.*

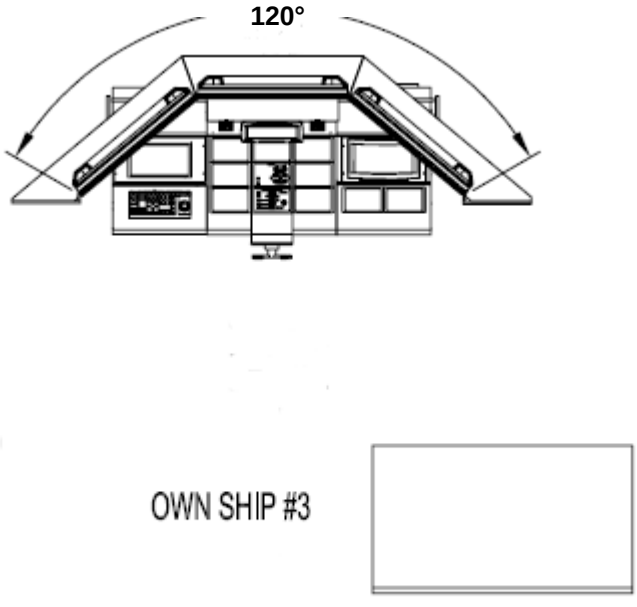
Mostek A / nr 1 (wizualizacja w zakresie 270°):



Mostek B / nr 2 (wizualizacja w zakresie 120°):

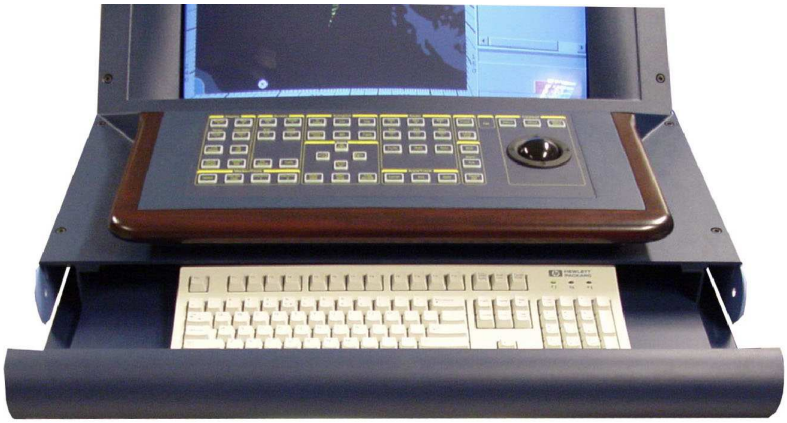


Mostek C / nr 3 (wizualizacja w zakresie 120°, wyposażenie jak na mostku B poza konsolą Voith-Schneider):



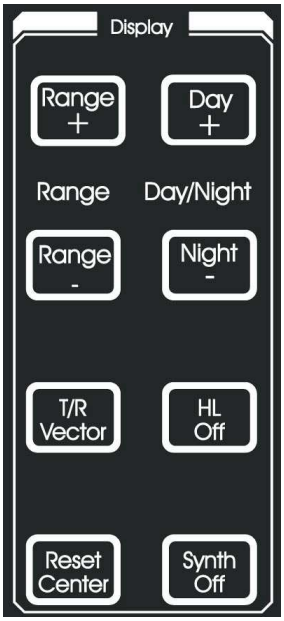
2. Radar / ARPA DataBridge® 10 - wskaźnik. *Radar / ARPA DataBridge® 10 – display console.*

The DataBridge® 10 is operated through an operator panel with trackball and a computer style keyboard located in a drawer below the operator panel.



The operator panel has dedicated buttons to gain quick access to frequently used functions. These functions can in most cases also be accessed using the trackball and select/offset/object keys.

The display keys are divided into the following:



Range + : Increases the range one increment for each push of the button (range up).

Range - : Decreases the range one increment for each push of the button (range down).

T/R Vector: Toggles between true vector and relative vector presentation.

Reset Centre: In true motion the sweep centre is moved to maximum offset. In relative motion the sweep centre is moved to the display centre.

Day + : Increases the light level in the display and operator panel from night to day viewing. Five different levels of intensity are available.

Night - : Decreases the light level in the display and operator panel from day to night viewing. Five different levels of intensity are available.

HL Off: Removes the heading line while the button is pushed and moves the cursor to the centre of the display.

Synth Off: Removes all synthetic information while the button is pushed - only radar video is displayed. The cursor is moved to the centre of the display.

The ARPA/Track keys are divided into the following:

Cancel: Used together with the trackball. Point to a tracked target and push the button to stop tracking of this target.
Acq.: Used together with the trackball. Point to a target and push the button to start acquiring it.
Data: Used together with the trackball. Point to a tracked target and push the button to display target data.

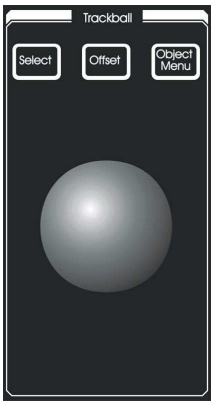
The Radar keys are divided into the following:

Gain + : Increases video gain in 1% steps.
Gain - : Decreases video gain in 1% steps.
Tx/Rx: Toggles the transceiver between transmitting and standby. The function will work for the scanner currently selected as radar source, provided the display is in master radar control mode.
Sea + : Increases Sea Clutter Reduction in 1% steps.
Sea - : Decreases Sea Clutter Reduction in 1% steps.
Auto (Sea): Used in open sea conditions to suppress sea clutter.
Rain +: Increase Rain Clutter Reduction in 3% steps.
Rain - : Decrease Rain Clutter Reduction in 3% steps.
Auto (Rain): Automatic rain clutter reduction.

The Screen keys are divided into the following:

Brill + : Increases display brilliance.
Brill - : Decreases display brilliance.
Degauss: When a monitor moves in the earths magnetic field the colours may be distorted. Push Degauss to restore the monitor to its original colours. The monitor is automatically degaussed at start-up.
Contr + : Increases display contrast.
Contr - : Decreases display contrast.
Calib: Resets Contrast and Brilliance to a calibrated/predefined setting.

The Trackball keys are divided into the following:



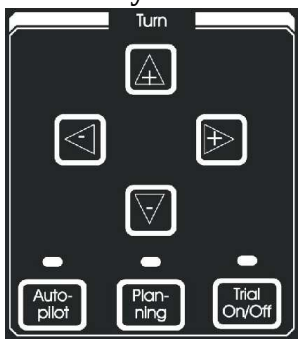
Select: Used to select an object or entry field. Use the trackball to point to the object and push SELECT.
Offset: Moves radar sweep centre to the position of the trackball Marker. If the Marker is outside maximum offset, the button will work as the reset centre function.
Object Menu: Used to select an object menu. Use the trackball to point to the object and push OBJECT MENU. The following objects have menus:
• EBL/VRM
• Parallel Index Lines
• Mariners Notes
• Barrier Lines

• Sailing Routes

The Marker / Tools keys are divided into the following:

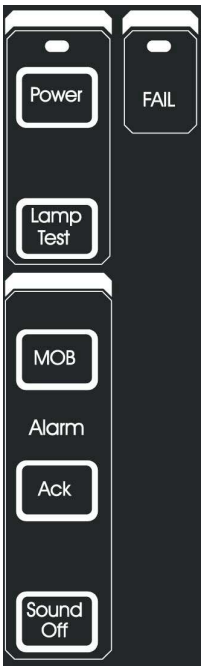
Select: Used to select an object or entry field. Use the trackball to point to the object and push SELECT. The same function as the SELECT button found next to the trackball.
Par. idx. Line: Turns parallel index lines on/off.
EBL/VRM 1: Turns EBL/VRM number 1 on/off.
EBL/VRM 2: Turns EBL/VRM number 2 on/off.

The Turn keys are divided into the following:



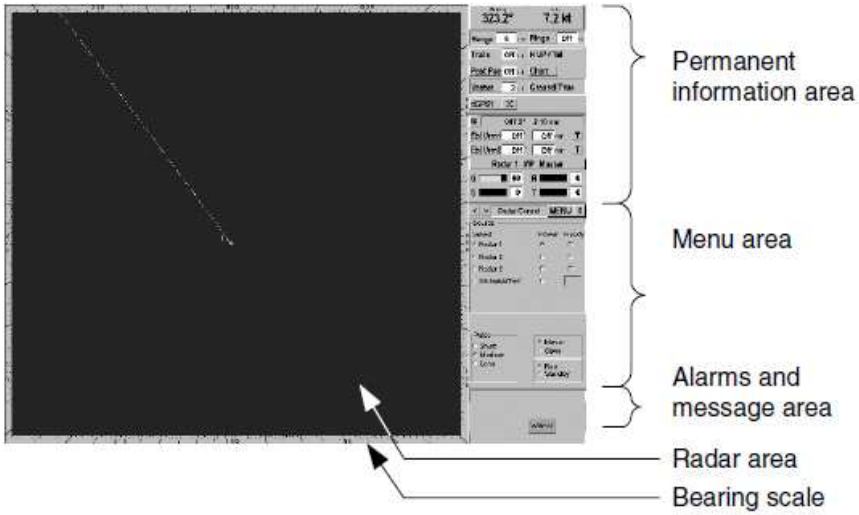
Left / Right/ Up/ Down arrows: Adjusts the Curved EBL. Left/right adjusts heading (course). Up/Down adjusts the Distance to Turn.
Planning: Activates a curved EBL in planningmode. The Curved EBL is used to plan and indicate where the ship will sail if a manoeuvre with the given turning radius is initiated.
Trial On/Off: Activates the trial manoeuvre. Activation will also activate the Curved EBL in planning mode.

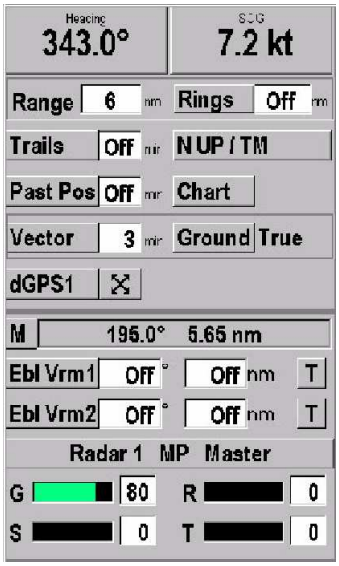
Other **keys** are divided into the following:



Power: Switches the display and transceiver power on or off. Push and hold for 3 seconds to activate.
Lamp Test: Push to test that all indicator lights illuminate.
MOB: Inserts an event symbol in the ship's current position on the display. Used for Man Over Board or other events.
Ack: Acknowledges alarm and warning messages. A list of unacknowledged alarms will appear and they will be considered acknowledged when the button is released. Using the Ack button when there are only active, acknowledged messages will display a list of these messages (does not apply to COLL, PROX, NEW and LOST)
Sound Off: Silences audible alarms.When more than one display unit is integrated, pressing the button on any display unit will silence the audible alarm on every unit.
FAIL: The lamp is lit by the system watchdog and indicates that the display computer is stopped or is running out of resources.

The display of DataBridge® 10 is divided into the following information areas:

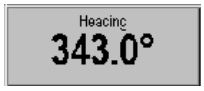




The permanent information area includes main information and softkeys for operation of the DataBridge® 10. Pushing softkeys in the permanent information area will bring up menus in the menu area.

Note: The information is displayed with different background colours to provide additional information to the user. The meanings of these colours are:

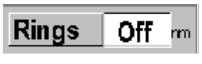
- ***Grey**: Normal.*
- ***Yellow**: Things are not quite normal, such as when trying to display charts when no charts are available.*
- ***Orange**: Abnormal operational state. Operating the system with manual heading or speed input will for example display heading and speed information on an orange background.*
- ***Red**: Alarm situation. The background is flashing until the alarm is acknowledged. When acknowledged the background will be red until the alarm situation is cleared.*



Own ship's heading: Pushing the softkey brings up the heading menu. This menu allows you to select heading source or manual heading input.

Own ship's speed: Pushing the softkey brings up the speed menu. This menu allows you to select between available speed sources or manual speed input.

Range scale selected: Use the SELECT button and the trackball to change the range scale or the buttons on the operator panel. Range scale is selectable between 0.125 and 96 nm.



Range rings: Push the softkey to select range rings on or off. Distance between range rings is dependent on the range scale selected.

Trails: Push the softkey to turn radar trails on or off. Trails length: 10 seconds to 6 minutes.

Radar display mode: Pushing the softkey brings up the Display mode menu. This menu allows you to select between the following display modes:
- NUP/TM - north up true motion
- NUP/FT - north up fixed centre, true vector and trials
- NUP/RM - north up relative motion
- CUP/TM - course up true motion
- CUP/FT - course up fixed centre, true vector and trials
- CUP/RM - course up relative motion
- HUP/RM - head up relative motion

Past position: Push the softkey to turn past position history on or off. Use the select button and the trackball to select the time interval between the history dots. Available time intervals are:
- Off
- 0.5 minute
- 1 minute
- 2 minutes

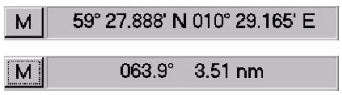
Chart / AIS: Push the Chart softkey to turn the chart on or off (optional function). When no charts are available the background colour is yellow in ON mode. Push the AIS softkey to turn the AIS receiver on or off. ON mode is only possible with own GPS, gyro and log signal received (turned on).

Vector: Push the softkey to turn vectors for tracked targets on or off. Use the SELECT button and the trackball to change the vector length. Vector length is selectable between 1 and 60 minutes.

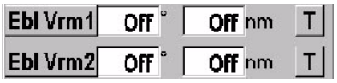
- Ground - ground stabilised vector
- Water - water stabilised vector
- Rel - relative vector presentation
- True - true vector presentation

Vector presentation modes are selected on the operator panel.

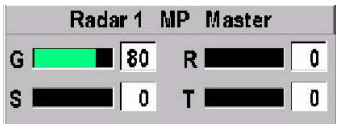
Position fixing system used: States the position fixing system currently in use. Pushing the softkey brings up the position menu. This menu allows you to select position input source or manualposition input. The softkey (marked “X”) on the right brings up the position offset menu. The background colour of the buttonindicates the accuracy of the source as follows:
- Grey: Highest accuracy source such as dGPS.
- Yellow: Medium accuracy source such as GPS.
- Orange: Lowest accuracy source such as dead reckoning.



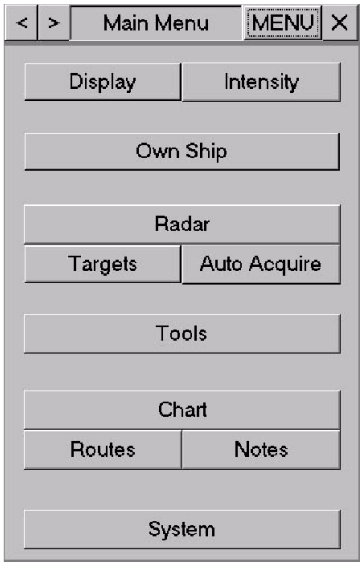
Marker: Pushing the marker softkey (M) toggles marker information between displaying bearing and range to own ship and marker latitude and longitude. The marker is continuously updated as long as the marker is inside the radar area.



EBL/VRM: Pushing the Ebl Vrm 1 and 2 softkeys turns each of the two electronic bearing lines/variable range markers on or off. The T/R softkeys toggle between true or relative bearing. The position of the EBL/VRM can also be set using the entry fields and the SELECT button and trackball.

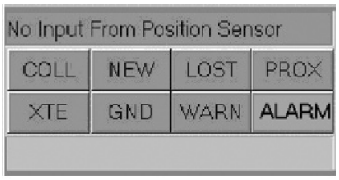


Radar: The top softkey indicates which scanner/transceiver is selected, the pulse length and if this display is master or slave to the scanner/transceiver. Pushing the softkey displays the **radar control menu**. Use the SELECT button and the trackball to set:
- G - video gain
- R - rain clutter control
- S - sea clutter control
- T - tune



The menu area is used to display the different menus and sub-menus. Menus are selected using the dedicated buttons on the operator panel, through the softkeys in the top bar or using the softkeys in the menu area. The sub-menus have been grouped as follows:
- Display
- Intensity
- Own ship
- Radar
- Targets
- Auto acquire
- Tools
- Chart
- Routes
- Notes
- System

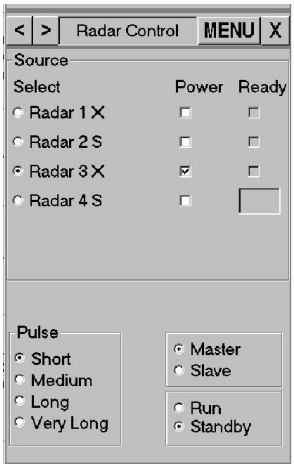
The control functions in the menu area are operated using trackball and the SELECT button.



The alarms and message area is used to present alarms and messages to the operator. Controls for acknowledging alarms and warnings are found here and on the operator control panel. Unacknowledged alarms are displayed on a flashing red background. Acknowledged alarms where the alarm situation still exist are displayed on a steady red background. The following types of alarms messages are used:
- **Coll**: Collision alarm. One or more of the tracked targets are violating the CPA/TCPA limits.

- **New**: New target alarm. Only for automatically acquired targets.
- **Lost**: Lost target alarm. Given when the tracking system has lost track of a target.
- **Prox**: Proximity alarm. One or more tracked targets are closer than the set proximity limit.
- **XTE**: Given when the cross track error is larger than the set limit.
- **GND**: Grounding alarm based on chart information. Requires that a chart system is available. Given when an obstacle is closer than a set limit.
- **Warn**: System warnings. Pushing the WARN softkey displays a list of warning messages in the menu area, if any.
- **Alarm**: System alarm. Pushing the Alarm softkey displays a list of alarm messages in the menu area, if any.

Uruchomienie (sprawdzić po restarcie scenariusza):

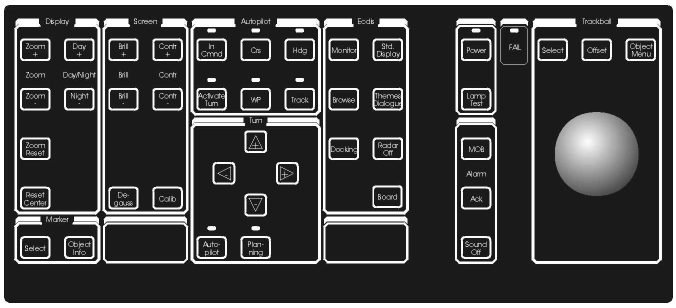


Radar po włączeniu wskaźnika przyciskiem POWER nie ma załączonego zasilania nadajnika.
Należy z **Main Menu**:

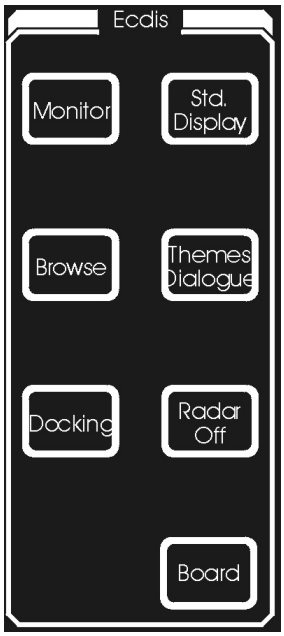
- wcisnąć **Radar** softkey;
- zaznaczyć pole Power przy odpowiednim nadajniku,
- wybrać długość impulsu,
- zaznaczyć Master,
- zaznaczyć Run.

3. ECDIS SeaMap® 10.

The SeaMap® 10 is operated through an operator panel with trackball and a computer style keyboard located in a drawer below the operator panel. **The operator panel** has dedicated buttons to gain quick access to frequently used functions – analogically to DataBridge® 10 ARPA.



The ECDIS keys are divided into the following:



Monitor: The normal mode for operating the ECDIS system. Push Monitor to display the chart centred on the own ship's position. The best chart for that position will be loaded.

Browse: Used to view chart areas away from the own ship. Push the button and use the trackball and Offset button to centre the chart in a new location. Use the Zoom + and Zoom - to set the appropriate scale.

Docking: Used for docking and manoeuvres in narrow waters. When selected a Docking Instruments menu is displayed to show the forces acting on the own ship. Docking is an optional feature.

Std. Display: Push this button to display only standard chart information. To select other chart information push the THEMES DIALOGUE button and select the information you need.

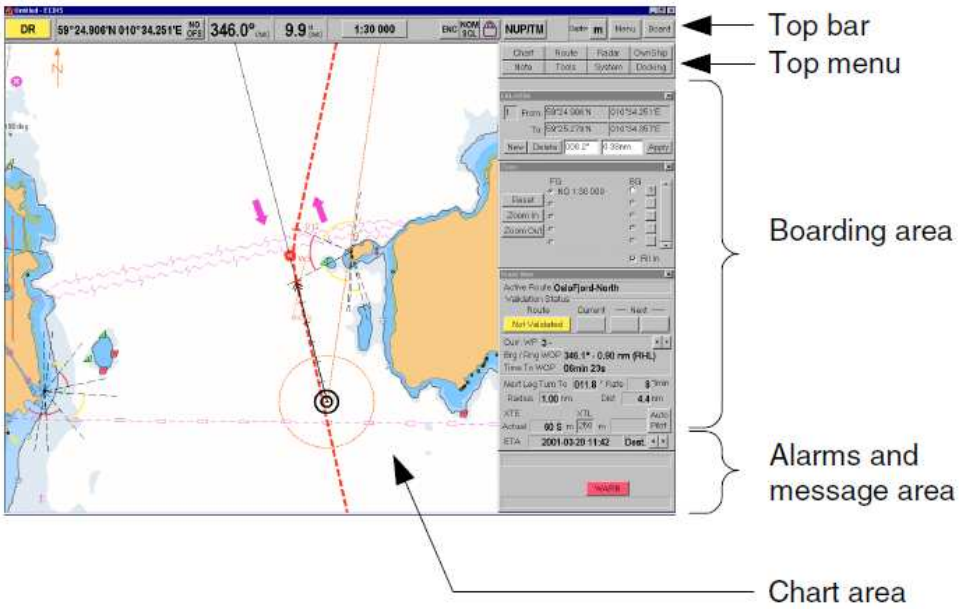
Themes Dialogue: Push to display the Themes menu. This menu is used to select the displayed chart information and is also available via top bar Menu – Chart. Vector charts are constructed such that different types of chart information can be switched on or off. Use the theme control to avoid cluttering the screen with information unimportant to your operational requirements:

- On the operator panel push Themes Dialogue - The Themes menu is displayed.
- Select the themes required, or choose STANDARD or EVERYTHING.

Radar Off: Push this button to turn radar video and tracked targets on/off.

Board: Push this button to display the boarding area.

The display of SeaMap® 10 is divided into the following information areas:



The top bar includes main information and buttons for operation of the SeaMap® 10.

Pushing buttons in the top bar will bring up menus in the menu area.

Position fixing system used: States the position fixing system currently in use. Pushing the button brings up the **Position** menu. This menu allows you to select position input source or manual position input. The background colour of the button indicates the accuracy of the source as follows:

- **Grey:** Highest accuracy source, such as DGPS.
- **Yellow:** Lowest accuracy source, such as DR (dead reckoning).

Current Own ship's position: States current own ships position. This is the conning position as computed by the navigation filter in WGS 84.

- N - north
- S - south
- E - east
- W - west

Offset indication: Push the button to enter a position offset. The offset can be entered as either range and bearing or latitude and longitude.

CMG: Course Made Good. This is the course over ground as computed by the navigation filter.

SMG: Speed made good. This is the speed over ground as computed by the navigation filter.

Chart Scale: Shows the actual scale of the displayed charts. Push the button to display the Zoom menu.

Chart type indicator: This button indicates the type of chart displayed. Push the button to display the Chart Type menu. The following chart types are available:
ENC (Electronic Navigational Chart - official charts) chart is displayed.
ENC and vector (non-ENC) chart is displayed.
Vector (non-ENC) chart is displayed.
Raster chart is displayed.

Chart scale status: Indicator showing how the chart is displayed. Push the button to display charts at nominal scale. The following scale indications are available:

- Chart displayed at nominal range (approximately). About at the same scale as the chart was intended to be viewed at.

- Chart displayed at over scale. In this case by a factor of 2.0 - larger scale than the chart was intended to be viewed at.

- Chart displayed at under scale. Smaller scale than the chart was intended to be viewed at.

Chart availability: Indicator to show if chart selection is manual or automatic. In automatic selection the chart with the best resolution is automatically loaded and displayed at nominal scale.

- Indicates manual chart selection and that the best chart available is displayed.

- Indicates that a better chart exists for this area (at own ships position). Push the button to load the better chart at its nominal scale.

- Indicates that the chart with the best resolution (at own ships position) is automatically loaded and displayed at nominal scale.

System degradation warning: Displayed when parameter settings or external factors may permanently degrade ECDIS performance or render the type approval invalid. Push the button to display the ECDIS State Window menu.

Autopilot: Indicator to show if the SeaMap® 10 is controlling the autopilot. Push the button to display the Autopilot menu.

- Grey circle indicates that the SeaMap® 10 is not controlling the autopilot.

- Yellow steering wheel indicates that the SeaMap® 10 is controlling the autopilot.

Chart display mode: Push the button to bring up the Display Mode menu. This menu allows you to select between the following monitoring modes:

- **NUP/TM** - north up true motion
- **NUP/RM** - north up relative motion
- **CUP/TM** - course up true motion
- **CUP/RM** - course up relative motion
- **HUP/RM** - head up relative motion

These modes are used for monitoring the ship's in relation to the chart. The system will automatically update the display to follow the ship's movement.

- **Browse** (NUP) - Used to move freely in the chart, away from own ships position.

Position the trackball marker where you want the centre of the chart to be, and push the **Offset** button on the operator panel. In this mode the system will not automatically update the display to follow the ship's movement.

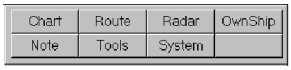
Targets: Select to display tracked targets. Push the button to display the radar menu. When no ARPA or AIS target source is selected, the selection is grey.

Video: Select to display radar video. Push the button to display the radar menu. When no radar video source is selected, the selection is grey.

Depth: Displays depth unit used in the displayed chart. Push to display the Chart Legend menu.

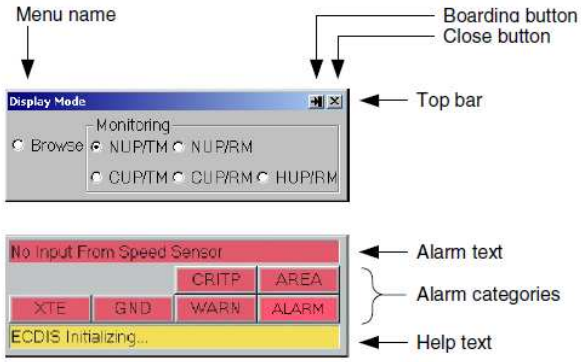
Menu: Push to turn display of main menu on or off.

Board: Push this button to display the boarding area. The boarding area is used to display several menus simultaneously. Each menu is fitted with a boarding button. Push this button to stack menus in the boarding area. Menus are stacked from the bottom up. New menus may be placed on top of any boarded menus when the area is full. A menu can also be boarded by dragging it into the boarding area. A menu is removed from the boarding area by dragging it into the chart area, or by closing the menu.

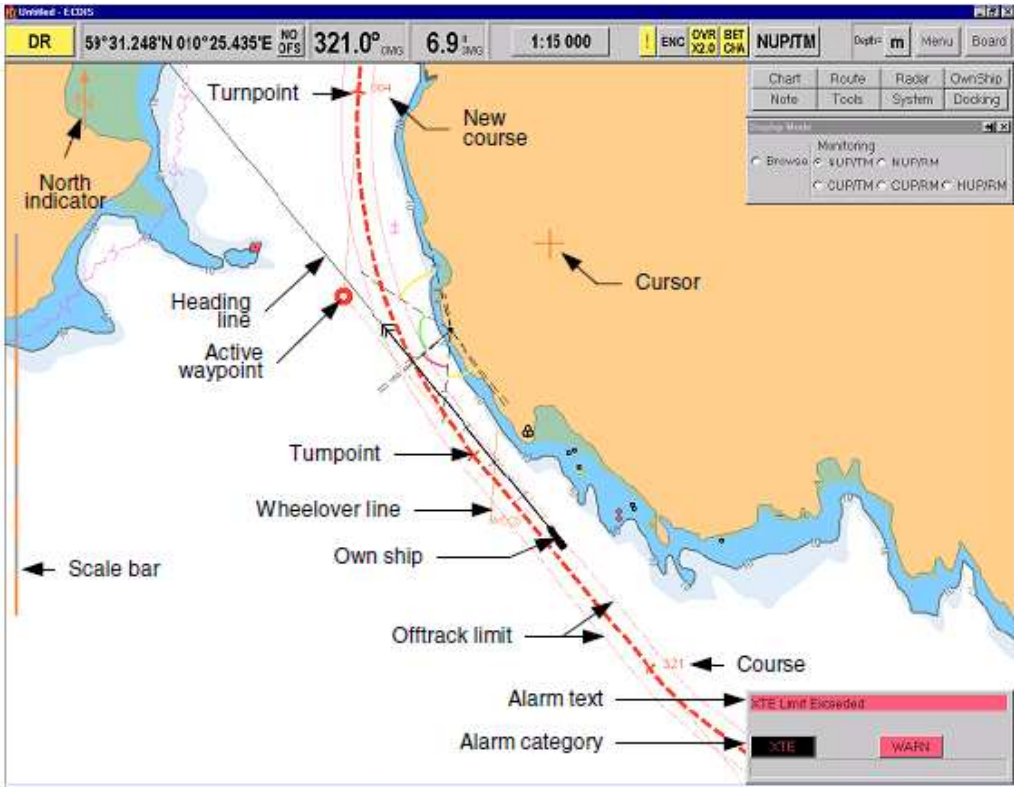


Menus are displayed using the dedicated buttons on the operator panel, through the buttons in the top bar or using the buttons in the main menu. The main menu has been grouped into sub menus as follo

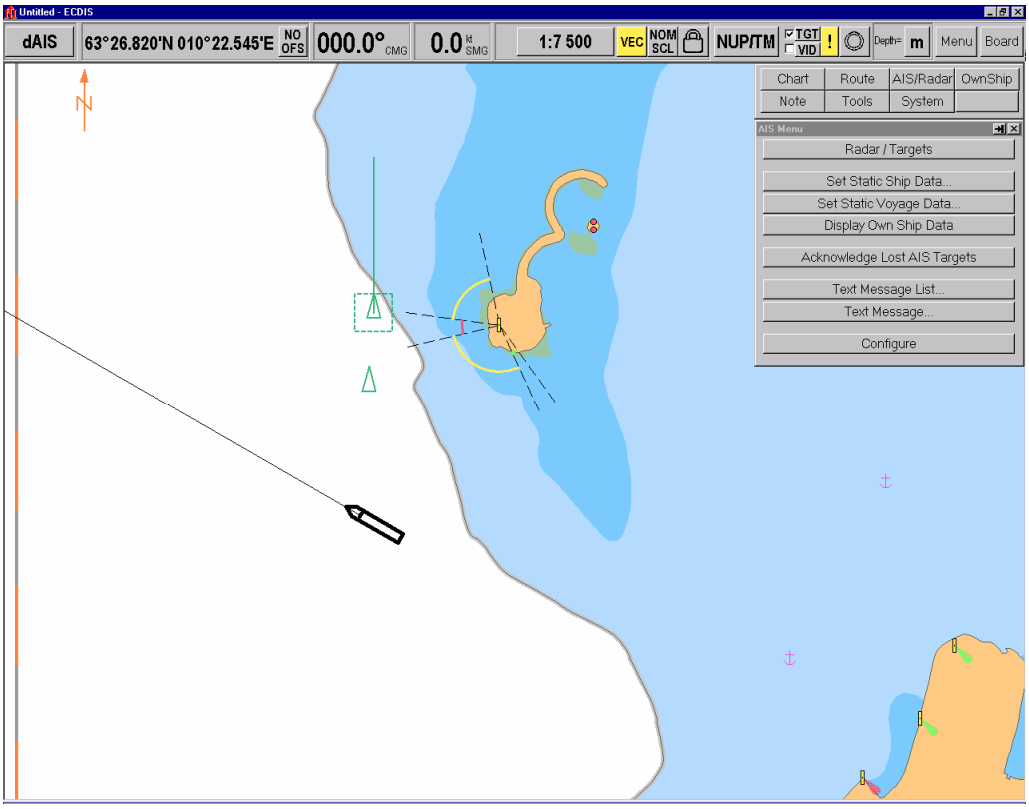
- Chart
- Route
- Radar
- Own ship
- Note
- Tools
- System



The chart area is used to display charts, and various chart related information such as routes, notes etc.

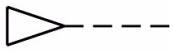


For integrated systems, where the SeaMap® 10 is connected to a DataBridge® 10, radar video and vectors for tracked targets can be displayed overlaid the chart information. The AIS targets are treated similar to ARPA targets and show in the chart display.

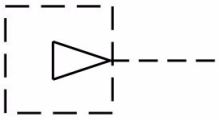


The following different target symbols are used to indicate target status and warning state

Sleeping targets: Initial position reports received from other ships result in "sleeping" targets on the display. Sleeping targets display a minimum of information, revealing position and course.



Active targets: Activate targets, reveal the ship's position, speed, heading and course. Vector length for other ships corresponds to own ships vector setting.



Selected targets: A selected target is indicated by a rectangle surrounding the target symbol.

Lost targets: Targets lost from the air that are nearer than a set distance, or that are categorised as dangerous will not be removed from the display. These are indicated in their last position as a lost target.

Dangerous targets: Targets having a TCPA and a CPA less than set values are considered to represent a collision danger and will be indicated using a red, blinking symbol.

4. Symulowane urządzenia nawigacyjne w konsoli. *Software navigation instrumentation in console.*

The POLARIS own ship console with software instrumentation is operated using trackball in Windows™ standard.

The main toolbar is found on the bottom of the monitor. An Icon symbolises all panels that are available but not displayed on the monitor. To display a panel on the monitor that is stored in the tool bar, click on the panel icon. The panel will come up in the size it was stored.

Icons and symbols (not all available in all bridges – real instruments are not augmented)**:**

 Clock showing exercise time	 Click to remove the toolbar	
 ANCHOR Control	 AZIMTH control/ Z – DRIVE control	 AZIMUTH CONNING / Z – DRIVE CONNING
 CHANGE OVER CONTROL	 CLINOMETER	 COMBINATOR CONTROL
 DGPS	 DISTRESS ALLERT	 DOPPLER LOG
 ECHO SOUNDER	 ENGINE ALARMS	 ENGINE POWER INDICATOR
 ENGINE TELEGRAPH	 FLAG/SHAPES/ LIGHTS	 GENERATOR CONTROL
 GYRO CONTROL	 GYRO CORRECTION	 HYDRAULIC WINCH control
 INMARSAT - B	 INMARSAT - C	 INTERCOM
 LOG/DIST/TIME	 LORAN C	 MORSE LIGHT
 MF/HF	 MF/HF DSC	 NAVIGATION LIGHTS
 NAVTEX	 OVERHEAD	 PITCH INDICATOR
 PROPULSION INDICATOR	 RADAR DISPLAY	 ROLL STABILISER
 ROTOR RUDDER CONTROL	 RUDDER CONTROL	 SOUND SIGNALS
 STEERING GEAR CONTROL	 STEERING SYSTEM	 TELEPHONE
 THROTTLE CONTROL	 THRUSTER CONTROL	 TRIM/LIST CONTROL
 UHF	 VHF	 VHF DSC
 VISUAL JOYSTICK CONTROL	 VISUAL VIEW	 WATCH RESPONSIBILITY / ENGINE control
 WINCH CONTROL	 Z – DRIVE CONTROL	 Z – DRIVE CONNING

Literatura. *References.*

[1] DataBridge® 10 Radar/ARPA display - Instruction manual, Kongsberg Maritime AS, Norway 2003.
[2] SeaMap® 10 ECDIS - Instruction manual, Kongsberg Maritime AS, Norway 2003.
[3] POLARIS Ship's Bridge Simulator – Technical Manual Section 5b – Instrumentation, Kongsberg Maritime AS, Norway 2006.

AKADEMIA MORSKA
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Lista kontrolna zadań wykonywanych w czasie przygotowania wyjścia statku z portu w symulatorze manewrowym CIRM
BRIDGE Pre-Departure Checklist: Instructions in Polaris™ ship's manoeuvring simulator of MTEC

Szczecin 2008

BRIDGE PRE-DEPARTURE CHECKLIST: Instructions

1. This form is designed as a Check List for use by the Master and ship's Officers to ensure that the vessel is ready in all respects to proceed to sea, and that it complies with the requirements of SOLAS relating to the testing of steering gear. *(SOLAS Chapter V, Reg. 26)*

2. This form is supplied in laminated form, and is used as a guide for preparing for arrival. After checking and ticking (✓) in the appropriate column (to show that the item has been checked), a log book entry is to be made in the following terms: "Pre-Arrival Checks carried out in accordance with Ops 17A."

3. The Log Book entry MUST be initialed by the Officer conducting the checks AND the Master.

4. Where any entry in the "NO" column of the form is made, the Master must be informed immediately and steps taken to rectify the problem as soon as possible prior to departure.

5. Note that this form also satisfies the requirements of certain flag state administrations for positive
"Go / No-Go" decision recording.

6. Masters and Bridge Watchkeeping Officers are reminded of the importance of demonstrating that the Automatic Identification System (AIS) has been properly programmed ((loaded/in ballast, destination, number of persons on board, etc.).

7. When the form is completed these instructions are to be omitted.

8. Distribution: Laminated Copy to be kept on the Bridge.

VESSEL :			**PORT:**		
ITEMS CHECKED *(as applicable)*	**YES (✓)**	**NO (x)**	**ITEMS CHECKED** *(as applicable)*	**YES (✓)**	**NO (x)**
River and port information available (Sailing Directions, ALRS, etc.)			Rudder and propeller clear of obstructions		
Current and Tidal information available			Steering Gear tested in manual, secondary and autopilot modes		
Restrictions on draught, speed, departure time, etc., known			Main Engine Telegraph/Bridge Wing Controls tested		
Latest navigational warnings available for the area			Main Engine blown through on air		
Charts for voyage fully corrected and ready for use			Bow and Stern Thrusters tested *(as applicable)*		
Latest weather report available			Gyro error ascertained by comparison with wharf alignment		
Pre-departure reporting procedures complied with including reporting of Dangerous Goods			Gyro repeaters aligned with Master		
Main VHF sets tested and on required channels			Gyro heading compared with Standard Magnetic Compass heading		
Walkie-Talkies available and tested			Whistles tested and signaling lamp ready for use		
Binoculars, sextant(s) and azimuth mirrors available for use			Navtex operational and correctly programmed		
All Radar sets running and performance satisfactory			GPS Navigator(s) position(s) compared with wharf position		
Bridge and Engine Room clocks synchronized			Navigation lights primary and secondary systems tested		
Echo Sounder tested			Signal lights tested		
Engine Movement Recorder operation verified			Pilot Card completed and available for use		
Course Recorder operation verified			Flags hoisted/signal lights exhibited as required		
All recording paper rolls marked with Dep./(Port)/Date /Time			Pilot ladders available with lifebuoys/lines/lights		
Telephones, public address and talk-back systems tested			Automatic Identification System (AIS) programmed?		

Steering Gear Checks (SOLAS) *(as applicable)*					
Main steering gear			Remote Steering control systems		
Auxiliary steering gear *(if fitted)*			Steering positions located on the Bridge, inc. Bridge wings.		
Emergency Power Supply			Rudder Angle Indicators / Actual rudder position		
Remote steering gear control system power failure alarms *(bridge & steering gear room)*			Steering gear power unit failure alarm.		
Automatic isolating arrangements *(if fitted)*			Other automatic equipment *(i.e. auto Change-over)*		
Full rudder movement			Time of Hardover-to-hardover as designed.		
Visual inspection of steering gear and linkage			Communications; Bridge to Steering gear room		

VESSEL IN ALL RESPECTS IS READY TO SAIL ("GO/NO-GO")		

ITEMS TO BE CHECKED	DESCRIPTION OF PROCEDURE
Communications; Bridge to Steering gear room	*Check the communication line from the Bridge to Steering Flat using: - a. the telephone; b. the talk back system and c. the powerless telephone (if fitted.)*
Main steering gear	*Visual check of the steering gear –(column, missing or broken bulbs, switches, handlers. The test applies to running performance of unit 1 and 2, etc.). Start pumps and controlling systems - check signaling lamps for correct indication.*
Full rudder movement	*Check full rudder movement by turning wheel from one side to other as indicated on the wheel scale and confirm from steering gear room*
Rudder Angle Indicators / Actual rudder position	*Move the rudder (10, 15, 20 etc) and compare each rudder angle indicator with actual position of rudder indicated on the wheel and on the mechanical indicator in the steering gear room*
Time of Hard over – to – hard over as designed.	*Switch on two pumps. Turn the wheel from side (35 deg) to side (30 deg) and count the time in seconds (SOLAS Ch II-1 reg. 29 paragraph 3.2 page 110; no more than 28 secs.)*
Remote Steering control systems	*All controls outside of steering gear are Remote Controls. Change over steering control from central to other position if fitted (console on the bridge, wings) and vice versa*
Steering positions located on the Bridge, inc. Bridge wings.	*Check rudder movement, operating from other places if fitted (console on the bridge wings).*
Emergency Power Supply	*Check power supply from ESB (emergency switch board). One pump is always supplied from ESB; this pump should be tested (e.g. 2). - Switch on this pump, put in service and observe the indicator light.* *Check if pump (e.g. 2) is in service.*