



QUICK REFERENCE

MARINE RADAR

MDC-7060/7010/7020

MDC-7960/7910/7920

This product is specifically designed to be installed on boats and other means of maritime transport. If your country forms part to the EU, please contact your dealer for advice before attempting to install elsewhere.

MDC-7000/7900 Series Quick Reference**Doc No: 0093169012****Document Revision History**

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0	0093169012-00	2016/07/13	First edition
1	0093169012-01	2016/10/14	USB Mouse/Trackball Operation Addition, Chapter 1
2	0093169012-02	2018/03/28	MDC-7000/7900 OC Series→MDC-7000/7900 Series
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Document No. Revised Version Norm

When part of the document needs to be revised, the document has advanced revision number.

The document No. is indicated at the lower right side on the cover and at the left or right side of the footer region of each page.

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USB Mouse / Trackball can be connected to this radar display.

Mouse icon to the left will be referenced throughout this document for references on mouse / trackball operation.

Contents

Document Revision History	i
Contents	ii
Chapter 1 Radar Basic Operation	1-1
1.1 Power ON/OFF	1-1
Power ON	1-1
Power OFF	1-1
1.2 Change Brilliance and Day/Night mode	1-2
Display Brilliance	1-2
Operation unit Brilliance	1-2
Day/Night mode	1-2
1.3 Transmission	1-3
Transmission ON	1-3
Transmission OFF	1-3
1.4 Change range scale	1-4
1.5 Adjust receiver gain (GAIN)	1-4
Selection of MAN GAIN and AUTO GAIN	1-4
Adjustment of GAIN	1-5
1.6 Reject sea clutter (anti-SEA)	1-5
Selection of MAN SEA and AUTO SEA	1-5
Adjustment of SEA	1-6
1.7 Reject rain/snow clutter (anti-RAIN)	1-6
Changing method of CFAR and MAN	1-6
RAIN MAN (manual) adjustment	1-7
CFAR (Constant False Alarm Rate) adjustment	1-7
1.8 Change transmission pulse width (SP/LP)	1-8
1.9 Select display Mode	1-8
1.10 Cross cursor operation	1-9
1.11 Measurement of distance by VRM	1-9
1.12 Measurement of bearing by EBL	1-10
1.13 Measurement of bearing and distance by ERBL	1-11
1.14 Trail	1-11
Trail ON/OFF and change Trail time	1-11
Change motion mode	1-12
Chapter 2 Target (AIS and TT)	2-1
2.1 Enable AIS function	2-1
2.2 AIS Active/Sleep	2-1

2.3	Set Input range	2-2
2.4	Set AIS filter	2-2
2.5	Enable TT function	2-3
2.6	Manual acquisition	2-3
2.7	Delete TT Target	2-3
2.8	Delete All TT Target.....	2-4
2.9	Display Target Information	2-4
Chapter 3 Other Setting		3-1
3.1	VECTOR REL/TRUE	3-1
3.2	VECTOR TIME.....	3-1
3.3	CPA/TCPA Alarm.....	3-2
3.4	USB Mouse/Trackball Basic Operation.....	3-3

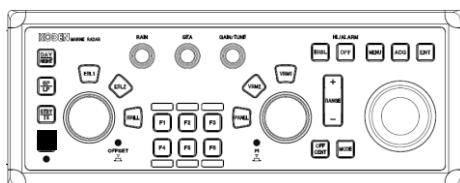
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Chapter 1 Radar Basic Operation

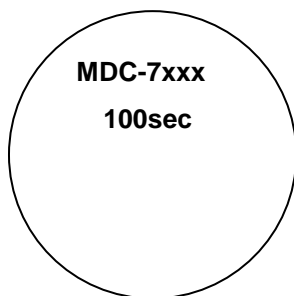
1.1 Power ON/OFF

Power ON

- 1 Press **POWER ON/OFF** key. Radar system is turned on with beep sound.



After power on, radar model name and preheating countdown time will appear on the center of the display.



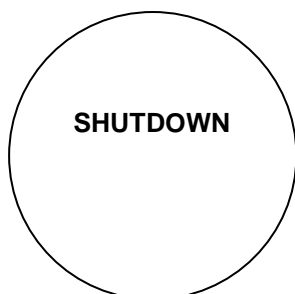
The brilliance of the display is set to the previous value of the last power off.

During operation, "POWER LAMP" under **POWER ON/OFF** key lights up red.

Power OFF

- 1 Press **POWER ON/OFF** key for three sec.

"SHUTDOWN" message appears on the center of the display, and few sec. later will completely power off.

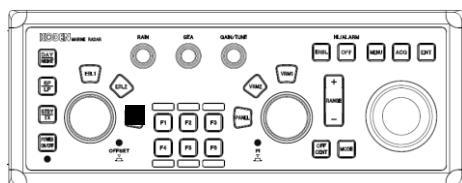


After radar has been turned off, wait at least five seconds before turning it back on.

1.2 Change Brilliance and Day/Night mode

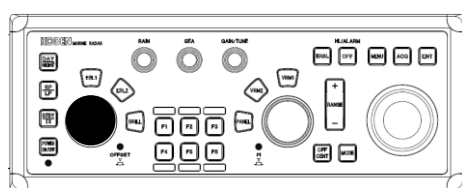
Display Brilliance

- 1 Press **BRILL** key. The BRILL adjustment window will appear on the upper left of the display.



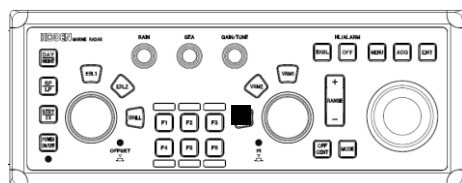
BRILL adjustment window

- 2 Turn **EBL** knob to adjust the display brilliance.



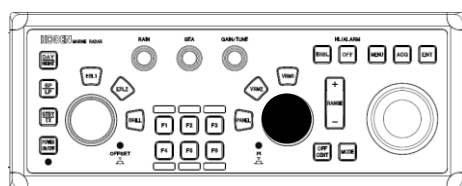
Operation unit Brilliance

- 1 Press **PANEL** key. The PANEL adjustment window will appear on the upper left of the display.



PANEL adjustment window

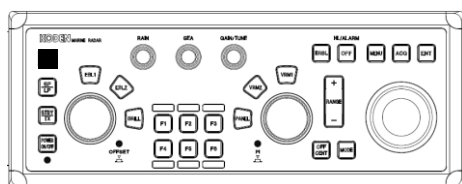
- 2 Turn **VRM** knob to adjust the panel brilliance.



Day/Night mode

- 1 Press **DAY/NIGHT** key.

When **DAY/NIGHT** key is pressed, DAY mode and NIGHT mode change alternately.

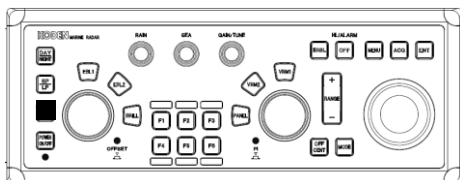


For setting DAY/NIGHT mode, move the cursor to **DAY** or **NIGHT** and click the **left button**.

1.3 Transmission

Transmission ON

- 1 Press **STBY/TX** key. Radar system will start transmission.



The status of **STANDBY** changes to **TRANSMIT** at upper left of the display.



Transmission OFF

- 1 Press **STBY/TX** key to stop transmission.

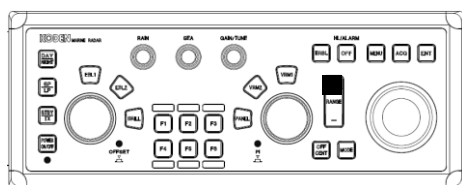
The status of **TRANSMIT** returns to **STANDBY** at upper left of the display.



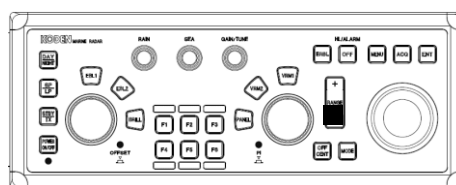
For Transmission ON/OFF operation, move the cursor to **STANDBY** or **TRANSMIT** and click the **left button**.

1.4 Change range scale

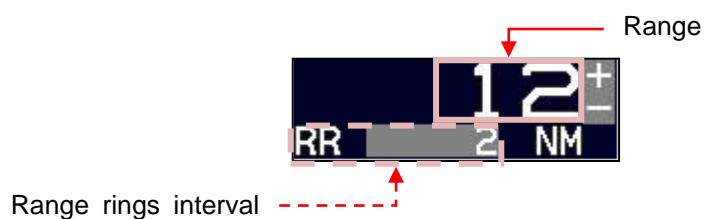
- 1 Press **RANGE +** key. The picture zoom out, and to observe a wider area.
- 2 Press **RANGE -** key. The picture zoom in, and to observe closer to Antenna position.



RANGE+



RANGE -



To change range scale, move the cursor to **+** and click the **left button**.

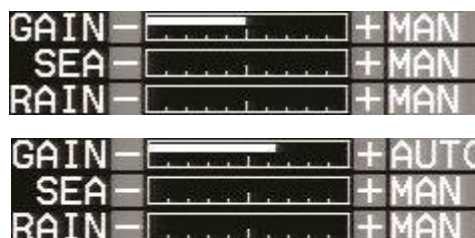
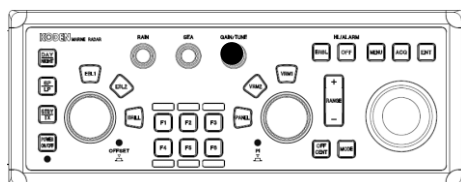


To change range rings interval display, move the cursor to [RR OFF/Range rings interval] and click the **left button**.

1.5 Adjust receiver gain (GAIN)

Selection of MAN GAIN and AUTO GAIN

- 1 **GAIN** knob is pressed, **AUTO GAIN** and **MAN GAIN** change alternately.



MAN
GAIN

AUTO
GAIN



To switch **MAN GAIN** / **AUTO GAIN**, move the cursor to **MAN** or **AUTO** and click the **left button**.

Adjustment of GAIN

When **MAN GAIN** is selected, GAIN can be adjusted manually.

- 1 Turn **GAIN** knob clockwise to increase receiving gain.
- 2 Turn **GAIN** knob counterclockwise to decrease receiving gain.



When **AUTO GAIN** is set, [GAIN] is adjusted automatically.

AUTO GAIN may remove weak target echoes, or too much sea clutter may be on the display, turn **GAIN** knob clockwise or counterclockwise to adjust AUTO GAIN effectively.

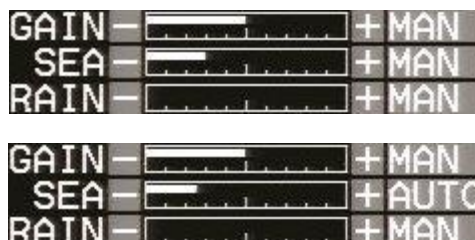
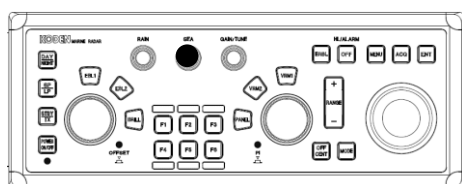


For adjustment of **GAIN**, move the cursor to **-** or **+** and click the **left button**.

1.6 Reject sea clutter (anti-SEA)

Selection of MAN SEA and AUTO SEA

- 1 **SEA** knob is pressed, **AUTO SEA** and **MAN SEA** change alternately.



MAN
SEA

AUTO
SEA



To switch **MAN SEA** / **AUTO SEA**, move the cursor to **MAN** or **AUTO** and click the **left button**.

Adjustment of SEA

When **MAN SEA** is selected, anti-SEA can be adjusted manually.

- 1 Turn **SEA** knob clockwise to increase anti-sea clutter effect.
Turn **SEA** knob counterclockwise to decrease anti-sea clutter effect.
- 2 Turn **SEA** knob clockwise until even low (weak) SEA clutter is displayed by observing the display.
- 3 Adjust **SEA** knob from time to time to get low (weak) SEA clutter on the display as intensity of sea clutter changes as time passes.



When **AUTO SEA** is set, anti-SEA is adjusted automatically.

AUTO SEA may erase weak target echoes. If excessive sea clutter erasing or too much clutter is observed, turn **SEA** knob clockwise or counterclockwise to adjust AUTO SEA effectively.

Note:

- If anti-SEA and anti-RAIN are used in combination, then small targets will be less visible.

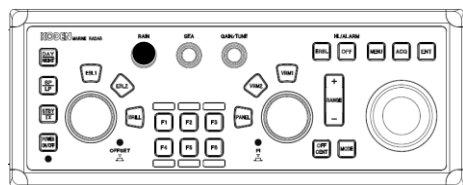


For adjustment of **SEA**, move the cursor to **-** or **+** and click the **left button**.

1.7 Reject rain/snow clutter (anti-RAIN)

Changing method of CFAR and MAN

- 1 **RAIN** knob is pressed, **MAN** and **CFAR** change alternately.



GAIN	-	+	MAN
SEA	-	+	MAN
RAIN	-	+	MAN

MAN
RAIN

GAIN	-	+	MAN
SEA	-	+	MAN
RAIN	-	+	CFAR

RAIN
CFAR



To change method of **MAN** / **CFAR**, move the cursor to **MAN** or **CFAR** and click the **left button**.

RAIN MAN (manual) adjustment

- 1 Turn **RAIN** knob clockwise to increase anti-clutter effect.
Turn **RAIN** knob counterclockwise to decrease anti-clutter effect.
Turn **GAIN** clockwise until sea clutter is visible on the display.



- 2 Use anti-SEA (AUTO SEA or MAN SEA).
- 3 While observing the display, suppress RAIN clutter outside of anti-SEA effective area by turning **RAIN** knob clockwise. Adjust RAIN so that sea clutter is lightly visible.
- 4 Intensity of RAIN clutter is affected by weather. Adjust by **RAIN** knob according to weather change by watching the display.

Note:

- In typical environment RAIN should be turned all the way down via **RAIN** knob, and no white level should be indicated by RAIN window.
- Turning the knob to the right shows profiles of the targets hidden in the rain/snow image, but care shall be taken that small target may be hidden and not displayed.
- Small target becomes harder to detect when RAIN is used together with SEA.



For **MAN RAIN** adjustment, move the cursor to **-** or **+** and click the **left button**.

CFAR (Constant False Alarm Rate) adjustment

- 1 Turn **RAIN** knob clockwise to increase anti-clutter effect.
Turn **RAIN** knob counterclockwise to decrease anti-clutter effect.



- 2 Turn **RAIN** knob clockwise to get even low (weak) clutter while watching the display.

Note:

- In typical environment CFAR should be turned all the way down via **RAIN** knob, and no white level should be indicated by CFAR window.
- Turning the knob to the right shows the targets hidden in the rain/snow image, but care shall be taken that small target may be hidden and not displayed if over adjusted.

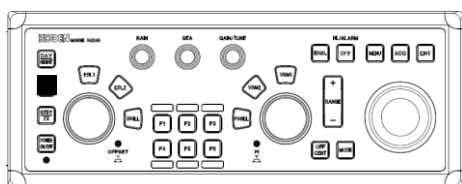
- If there are strong echo targets such as in the harbor or channel, CFAR tends to suppress targets excessively. In that case, change CFAR to MAN and use MAN SEA in addition.
- In case of **CFAR** mode, the gain adjustment is not possible.



For CFAR adjustment, move the cursor to **-** or **+** and click the **left button**.

1.8 Change transmission pulse width (SP/LP)

- 1 Press **SP/LP** key. Two different pulse widths are toggled by pressing **SP/LP** key.



3+ RADAR X-BAND
- TRANSMIT M3
NM REF CCRP 1

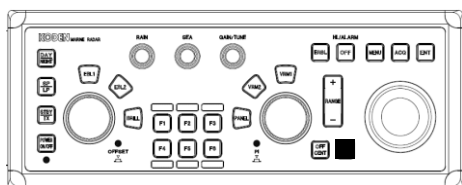
Pulse width



To change transmission pulse width, move the cursor to **S1**, **S2**, **M1**, **M2**, **M3**, **L1**, **L2** or **L3** and click the **left button**.

1.9 Select display Mode

- 1 Press **MODE** key.



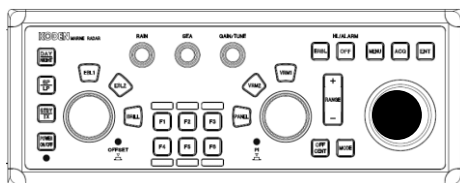
The display mode changes in following order by pressing **MODE** key.



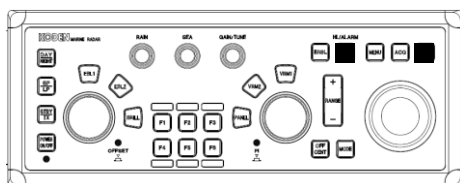
To change display mode, move the cursor to **H UP_{RM}**, **C UP_{TM}**, **C UP_{RM}**, **N UP_{TM}** or **N UP_{RM}** and click the **left button**.

1.10 Cross cursor operation

- 1 Move the cross cursor with **trackball**.
The cross cursor moves to the **trackball** turning direction.
The information data of cross cursor is displayed at lower right of the display.



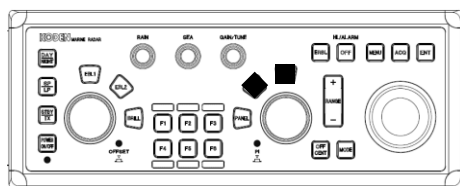
- 2 Press **ENT** key (while pressing **OFF** key) to return cross cursor to the reference point position.



Cross cursor can be moved with the mouse / trackball.

1.11 Measurement of distance by VRM

- 1 Press **VRM1** or **VRM2** key to display VRM1 or VRM2 circle.
The color of selected **VRM** key on the operating panel changes to red.

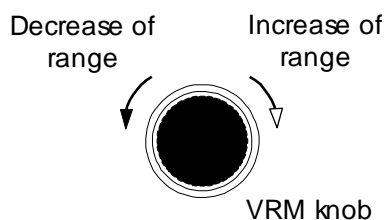


The distance to the target is indicated on the lower right of the display.



Selected VRM ► mark

- 2 Turn **VRM** knob clockwise or counterclockwise, respectively.



- 3 Another press of selected **VRM1** or **VRM2** key, and the VRM circle disappears.



Move the cursor to **VRM1** or **VRM2** and click the **left button**. Then the VRM1 or VRM2 circle changes to display or non-display.

The selected VRM radius can be changed by turning the **mouse wheel**.

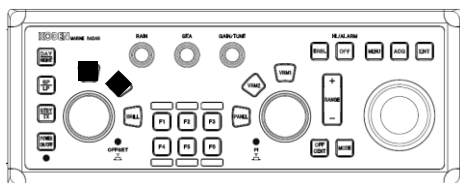


Move the cursor to the VRM1 or VRM2 circle. Move the mouse while holding the **left button** down and release the **left button** to change the VRM radius.

1.12 Measurement of bearing by EBL

- 1 Press **EBL1** or **EBL2** key to display EBL line.

The color of selected **EBL** key on the operating panel changes to red.

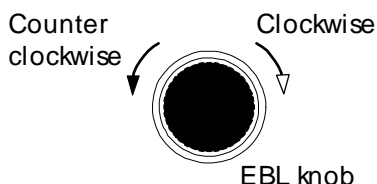


The bearing value to the target is indicated on the lower left of the display.

Selected EBL ► mark



- 2 Turn **EBL** knob to adjust the line on the desired target.



- 3 Another press of selected **EBL1** or **EBL2** key, and the EBL line disappears.



Move the cursor to **EBL1** or **EBL2** and click the **left button**. Then the EBL1 or EBL2 line changes to display or non-display.

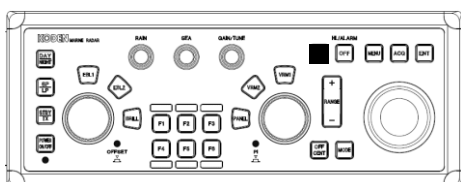
Bearing of the selected EBL can be changed by turning the **mouse wheel**.



Move the cursor to the EBL1 or EBL2 line. Move the mouse while holding the **left button** down and release the **left button** to change the bearing of EBL.

1.13 Measurement of bearing and distance by ERBL

- 1 Press **ERBL** key to display ERBL line. The bearing and distance value of ERBL is indicated lower right of the display.



- 2 When you press **OFF** and **ENT** key simultaneously, EREL origin move to own ship position.
- 3 Press **ERBL** key again. The ERBL line disappears.

1.14 Trail

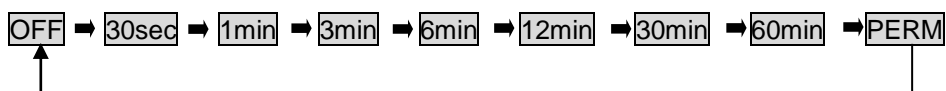
The trail [TIME] and [REL] or [TRUE] mode can be changed directly on the lower left of the display, with cursor and **ENT** key.

Trail ON/OFF and change Trail time

- 1 Move cursor to the trail time status box.
- 2 Press **ENT** key to change trail time.



The trail time changes in following order by **ENT** key.



At the start of trail, “TRAIL” characters at lower left of the display change to yellow. When trail time has passed, character color turns white.

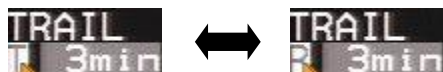
Select **OFF**, the trail is not displayed.



For trail ON/OFF function and to change Trail time, move the cursor to “TRAIL TIME” on the lower left corner of display and click the **left button**.

Change motion mode

- 1 Move cursor to the trail motion mode status box.
- 2 Press **ENT** key to change motion mode.



When **ENT** key is pressed, R (Relative) and T (True) change alternately.



To change motion mode, move the cursor to “TRAIL” **T** or **R** on the lower left corner of display and click the **left button**.

Chapter 2 Target (AIS and TT)

2.1 Enable AIS function

- 1 Move cursor to the AIS **ON** or **OFF**, and press **ENT** key.



When **ENT** key is pressed, **OFF** and **ON** change alternately.



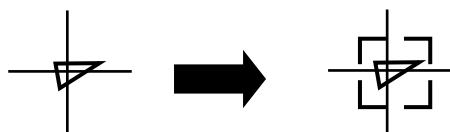
To switch AIS ON/OFF function, move the cursor to **OFF** or **ON** and click the **left button**.

2.2 AIS Active/Sleep

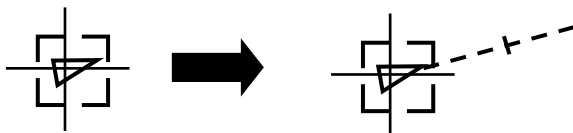
- 1 Move cursor to the desired AIS target, and press **ENT** key.

The mark of selected AIS will be shown around desired AIS target.

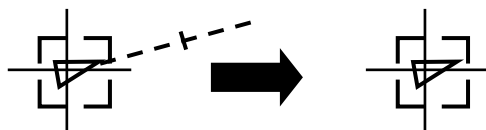
Selected AIS target information will be displayed on TGT INFO and SELECTED AIS INFO area.



- 2 Press **ENT** key. Selected AIS target will be activated.



- 3 Press **ENT** key again. Selected AIS target will sleep.



For AIS Active/Sleep, move the cursor to the AIS target and click the **left button**.

2.3 Set Input range

Input range menu designates the entire operation range of AIS and TT. So, AIS and TT do not function outside of the range.

- 1 Press **MENU** key to display "Menu".
- 2 [TARGET] => [INPUT RNG] => and press **ENT** key after selecting the setup value.
Selection values: 1.0NM to 64.0NM

2.4 Set AIS filter

It is possible to hide unnecessary sleeping targets or to display the necessary targets only by setting AIS FILTER.

- 1 Move cursor to the AIS filter status, and press **ENT** key. [AIS FILTER] menu will be shown.
Press **MENU** key to close the menu after setting value. AIS filter is indicated in target status window at right of the display.

FILTER ABO 

11	>AIS FILTER	
01	CLASS A	ON
02	CLASS B	OFF
03	RNG	1 .0NM
04	SPD	1 .0kn
05	CPA/TCPA	ON
06	MOORED	ON
07	AT ANCHOR	OFF
08	AGROUND	ON
09	NUC	ON
10	GUARD ZONE	OFF
11	ECHO ALARM	OFF

The filter is absolutely used to limit display.
When input data is to be limited, [TARGET] =>
[INPUT RNG] shall be operated.

2.5 Enable TT function

- 1 Move cursor to the TT **ON** or **OFF**, and press **ENT** key.



When **ENT** key is pressed, **OFF** and **ON** change alternately.

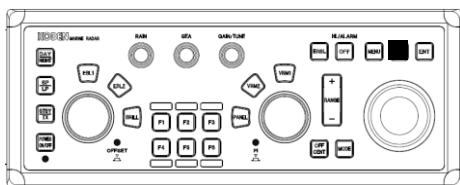
Pressing **ACQ** key in [OFF] state automatically turns to [ON] state.



To switch TT ON/OFF function, move the cursor to **OFF** or **ON** and click the **left button**.

2.6 Manual acquisition

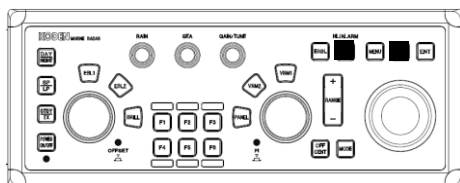
- 1 Move cursor to a target to be acquired, and then press **ACQ** key. A symbol is displayed at the cursor location, and acquisition starts.



For manual acquisition, move the cursor to the target and click the **right button**.

2.7 Delete TT Target

- 1 Move cursor to a target to be deleted, and then press **OFF** and **ACQ** key.



Selected TT symbol will disappear.

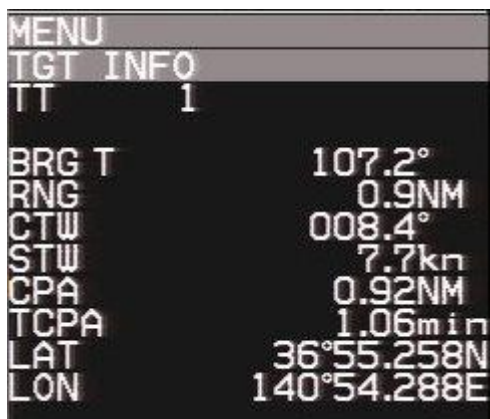
2.8 Delete All TT Target

- 1 Press **MENU** key to display "Menu".
- 2 [TARGET] => [TT] => [ALL DELETE], and press **ENT** key.

All TT targets will disappear.

2.9 Display Target Information

- 1 Move cursor on the TT or AIS target to display the numerical information, and press **ENT** key.
The information of the selected TT or AIS targets will be displayed at right side of the display.



The screenshot shows a radar display with the following information:

MENU	
TGT INFO	
TT	1
BRG T	107.2°
RNG	0.9NM
CTW	008.4°
STW	7.7kn
CPA	0.92NM
TCPA	1.06min
LAT	36°55.258N
LON	140°54.288E



To display target information, move the cursor to the TT symbol and click the **left button**.

Chapter 3 Other Setting

3.1 VECTOR REL/TRUE

- 1 Move cursor to vector mode icon, and press **ENT** key to change vector mode.



When **ENT** key is pressed, R (Relative) and T (True) change alternately.



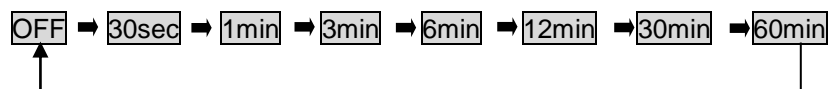
To switch **VECT REL** / **VECT TRUE**, move the cursor to **R** or **T** and click the **left button**.

3.2 VECTOR TIME

- 1 Move cursor to set the value window of vector time, and press **ENT** key.



The vector time changes in following order by **ENT** key.



To change vector time, move the cursor to **[VECT Time]** and click the **left button**.

3.3 CPA/TCPA Alarm

The menu of “[TARGET] => [CPA/TCPA]” sets the alarm function ON or OFF.

To avoid collision, it sets up LIMIT CPA and LIMIT TCPA.

- 1 Move cursor to the set value window of CPA or TCPA.
- 2 Press **ENT** key and change the setting value with trackball.
- 3 Press **ENT** key after changing the setup value.



Move the cursor to [CPA **Time**] or [TCPA **Time**] and click the **left button**. Then the numeric value characters will be changed to reverse characters and the numeric value of setting can be changed.



The numeric value will increase/decrease by turning the **mouse wheel**.

Click the **left button**, and the setting digit can be moved.

Long press the **left button** to confirm a setting value.

3.4 USB Mouse/Trackball Basic Operation



MENU operation

- 1 Move the cursor to **MENU** on the right side of the display and click the **left button**.
“MENU” is displayed on the right side of the display.
- 2 Move the mouse to select the menu item.
- 3 Click the **left button** to go to the following “MENU”.
Click the **right button** to return to the previous “MENU”.
- 4 Long press the **left button** to confirm a setting value.
- 5 Click the **right button** while holding the **left button** down to close “MENU”.



ALARM stop (Acknowledged)

In case of malfunction, the alarm sound and display appear on the lower right of the display.

Record the alarm detail and move the cursor to the alarm display area on the lower right corner of display. Click the **left button**, and the alarm sound and display will disappear.



MOUSE movement speed

The tracking speed of the mouse pointer can be set by the following menu.

[MAINTENANCE] => [STARTUP] => [MOUSE SPEED]

Setting Value : FAST, MEDIUM, SLOW



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