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Sales Bulletin

Attention: All FURUNO Distributors/Subsidiaries

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Model: DRS2D-NXT

Compact – 19” Dome Solid-State Doppler Radar

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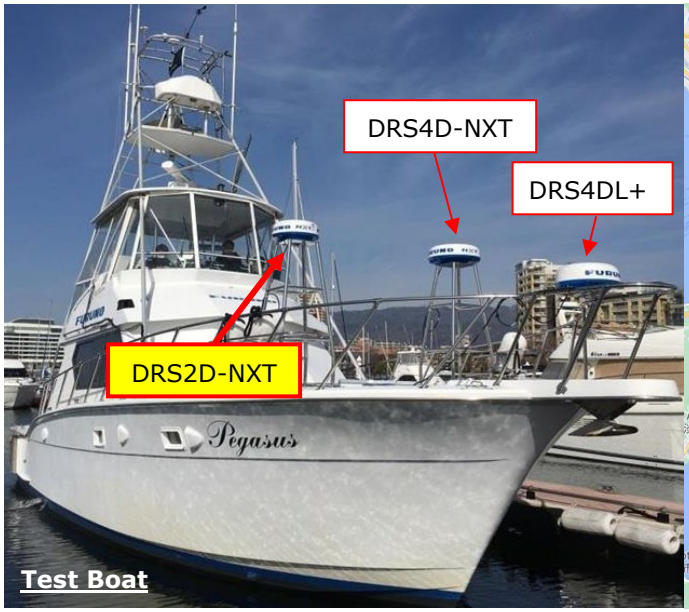
1. Proven Performance with Compact Dome

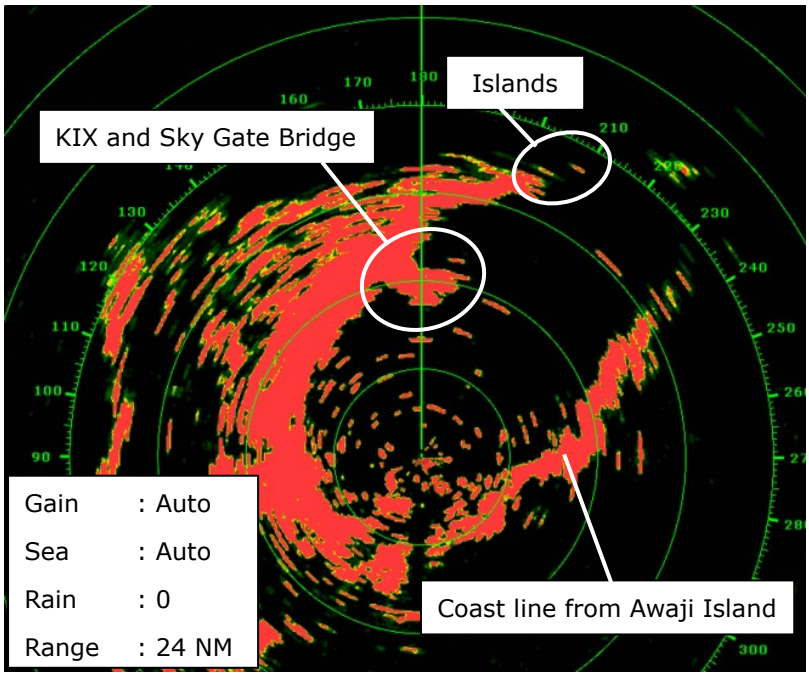
DRS2D-NXT is a new 25 W dome type model in the DRS-NXT series. While the transceiver of DRS4D-NXT is enclosed in a 19 inch (488 mm) dome with the 17 inch antenna, the proven performance of the DRS4D-NXT is also enjoyable with the new DRS2D-NXT. This section describes the capabilities of the DRS2D-NXT.

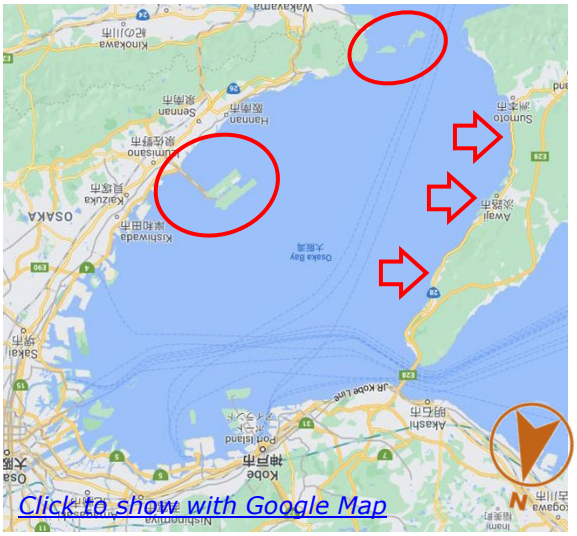
Test Site



1.1. Long Range Detection Performance

The DRS2D-NXT in Auto mode shows the shape of Osaka Bay including the structure of KIX airport with the Sky Gate Bridge and the coast line of Awaji Island, as well as two (2) small islands. Vessels navigating the bay are also detected.



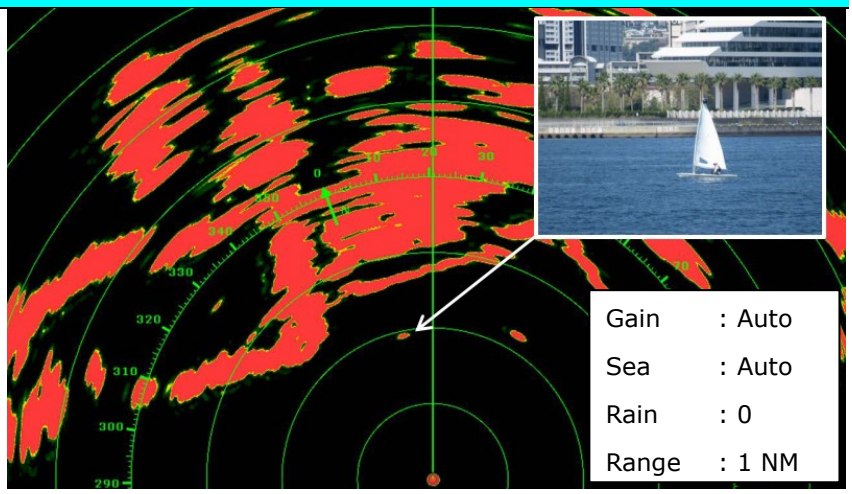


1.2. Short Range Detection Performance

This is an example of detecting a small sailing dinghy at a distance of 0.5 NM.

Note:

The height of the yacht was approx. 2.5 m, and the DRS2D-NXT in Auto mode picked it up without issue. Low height targets like small buoys or drifting woods may be suppressed with waves in the Auto Sea mode.

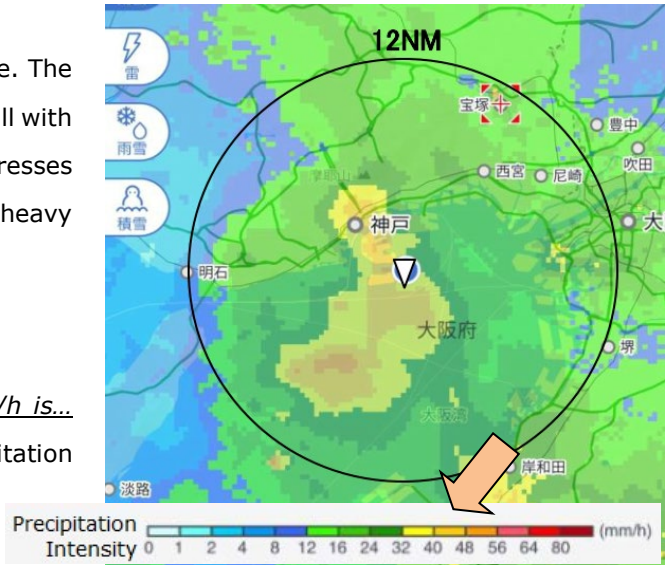


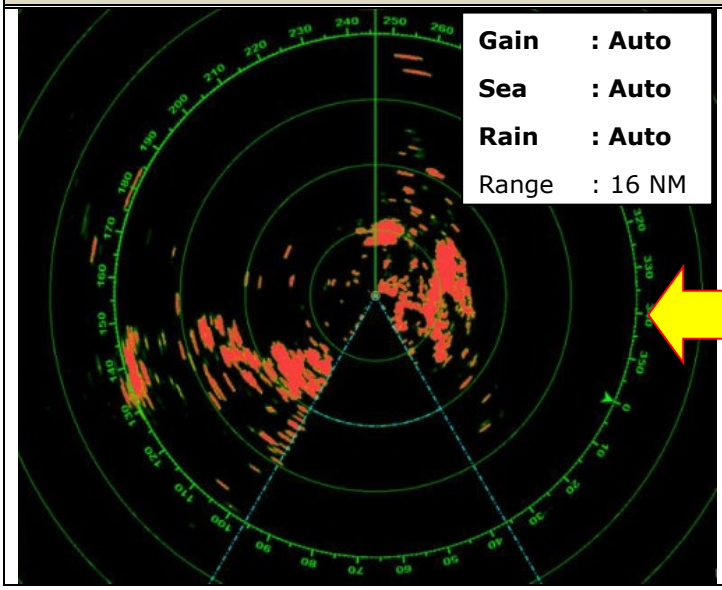
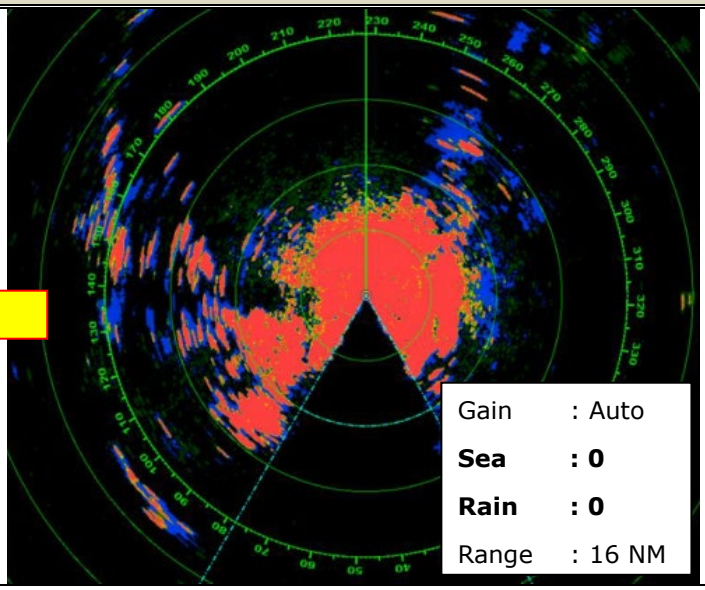
1.3. Auto Gain/Sea/Rain

The DRS2D-NXT highlights targets in Auto Gain/Sea/Rain mode. The following screenshots were taken during a period of heavy rainfall with over 40 mm/h of precipitation: The DRS2D-NXT effectively suppresses the sea and rain clutter to pick up vessel targets operating in heavy rain.

E.g. Weather Radar to show how heavy 40 mm/h is…

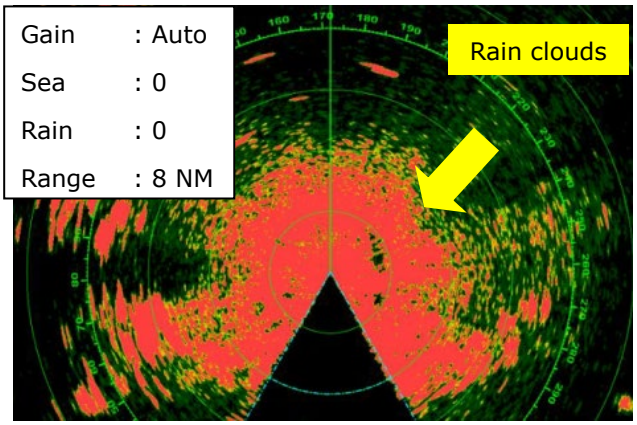
Light orange colors for the 40 mm/h of precipitation



Auto with Clear Targets	Rain Echoes
	

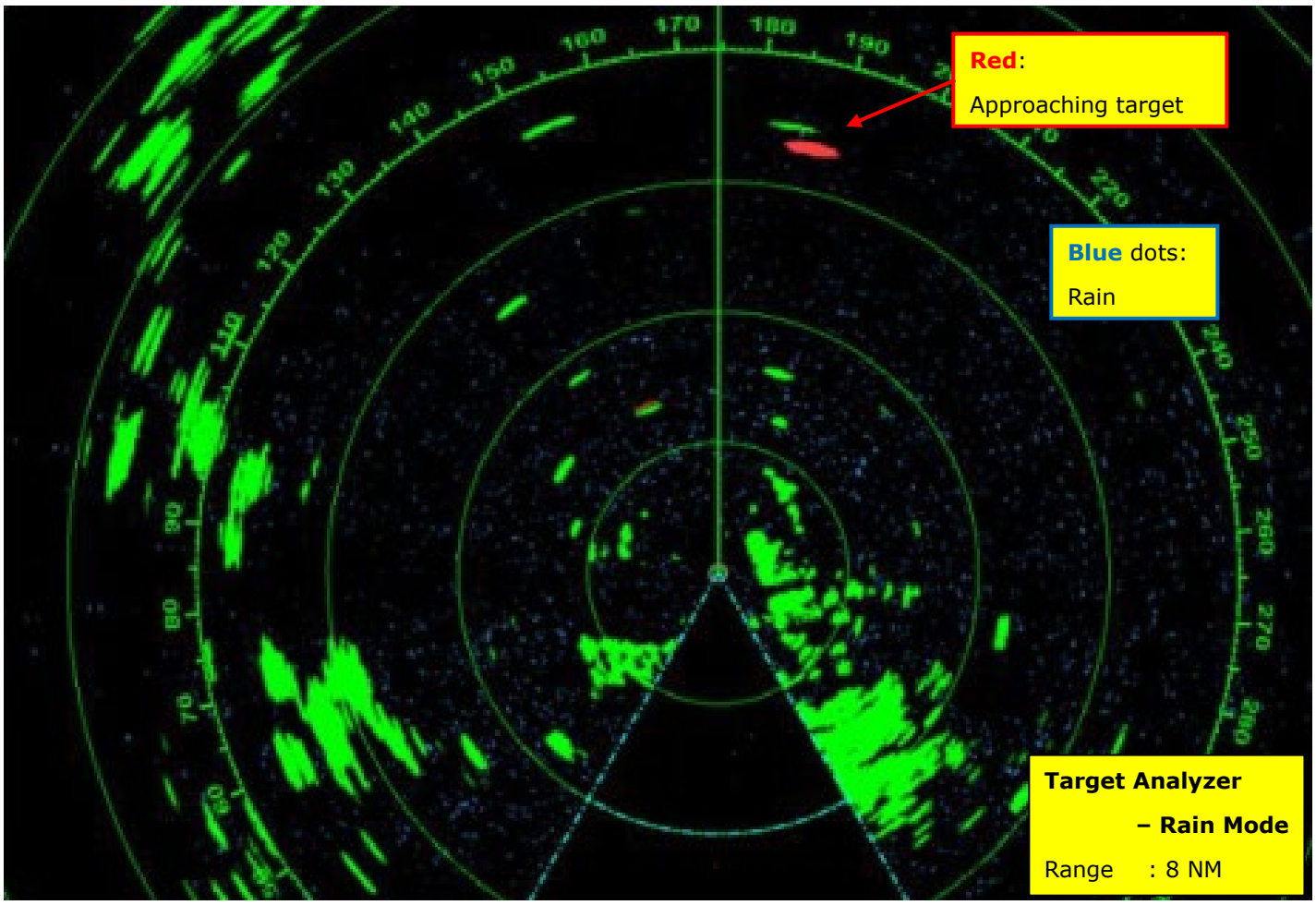
1.4. Target Analyzer

The DRS2D-NXT includes the **Target Analyzer** function of other DRS-NXT series models to show approaching targets over 3 knots in red.



The screenshot at right was taken on the same rainy day from **Section 1.3**, i.e. over 40 mm/h of rainfall. Rain echoes fully cover the center of the screen, so that you cannot see where targets are located or whether they are approaching to own ship.

Let's see how Target Analyzer can help identify targets: After the **Target Analyzer – Rain Mode** is turned on, one approaching target in red and stationary targets in green are instantly identified under the rain shown in blue dots.

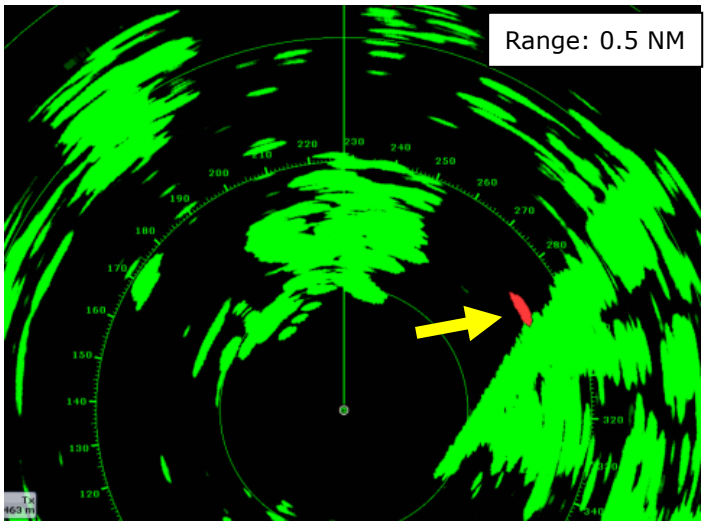


Note:

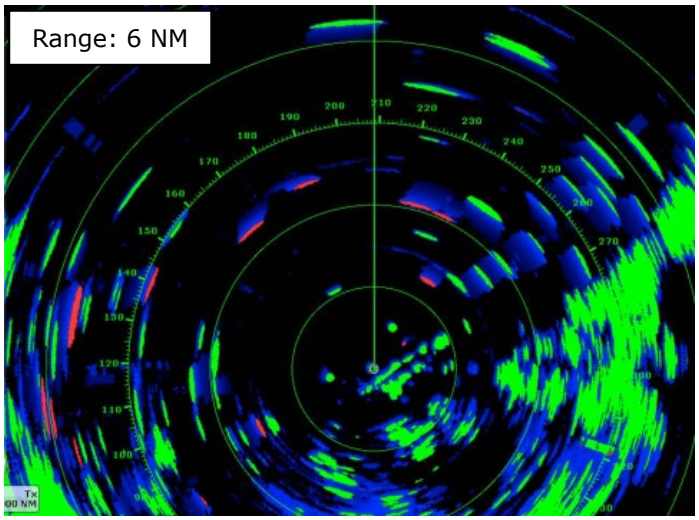
The DRS2D-NXT has a wider beam than the other models due to a shorter antenna length: Rain clutter is smoothed, so that rain targets are shown in weaker dots than would be shown on other models.

The screenshots above are also introduced in **Sales Bulletin FSB21-0019** to show the benefit of Target Analyzer – Rain Mode.

Here are other examples taken on a different day to show how **Target Analyzer – Target Mode** contributes to safe navigation by quickly identifying approaching targets.



This target is located alongside a wharf. In the conventional presentation mode, this target will be shown in the same color as the wharf and can be interpreted as a part of the wharf structure. Target Analyzer helps identify the approaching target shown in red.

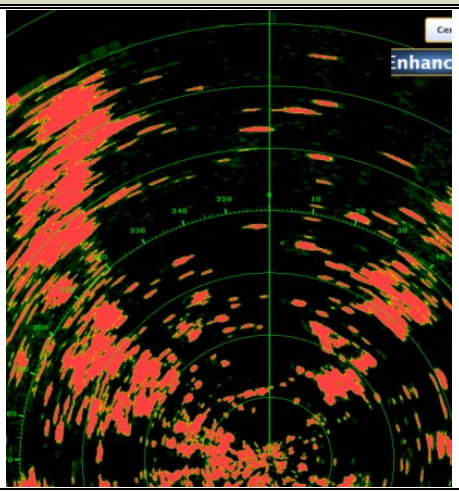
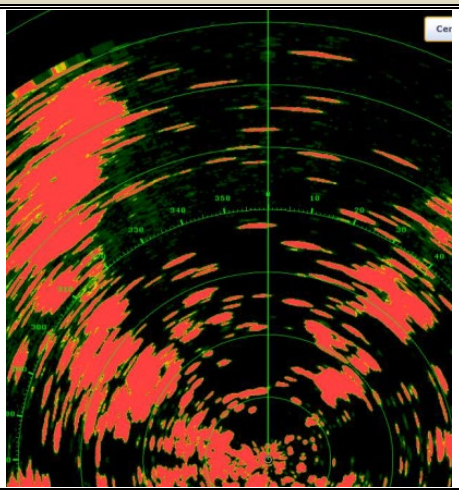
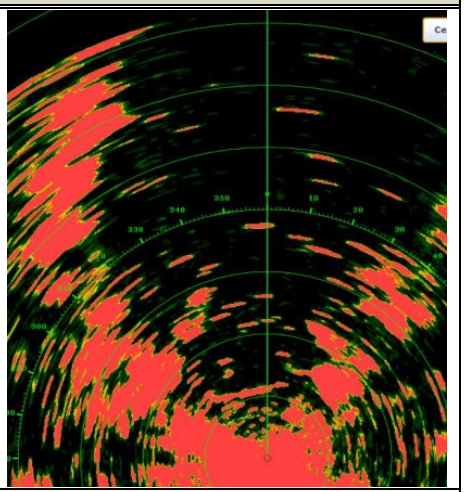


While a variety of targets are present, you can see at a glance which ones are approaching own ship. Echo Trail also helps us to see how each target has moved.

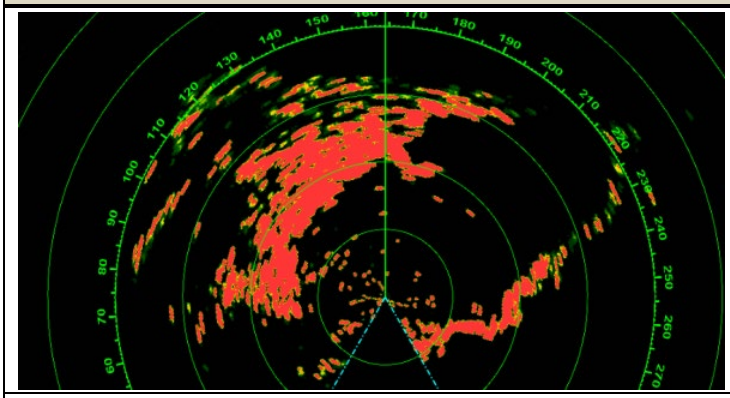
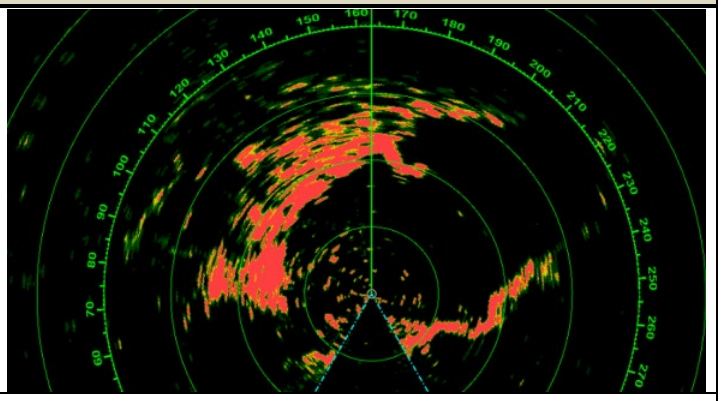
1.5. RezBoost™

While farther targets tend to be shown in fat or wide echoes, **RezBoost™** helps sharpen these target presentations.

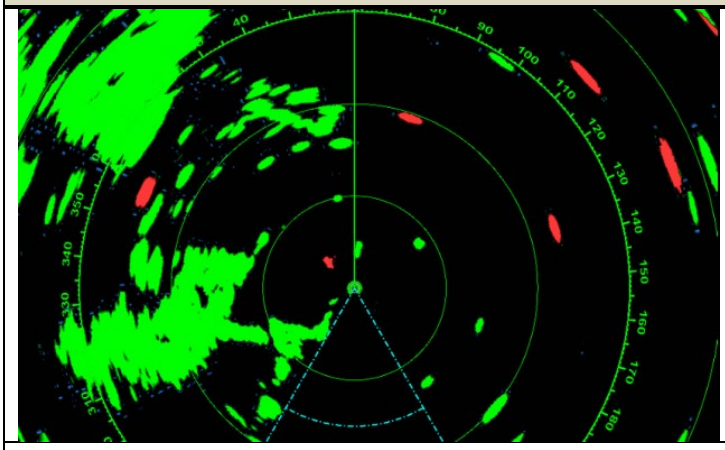
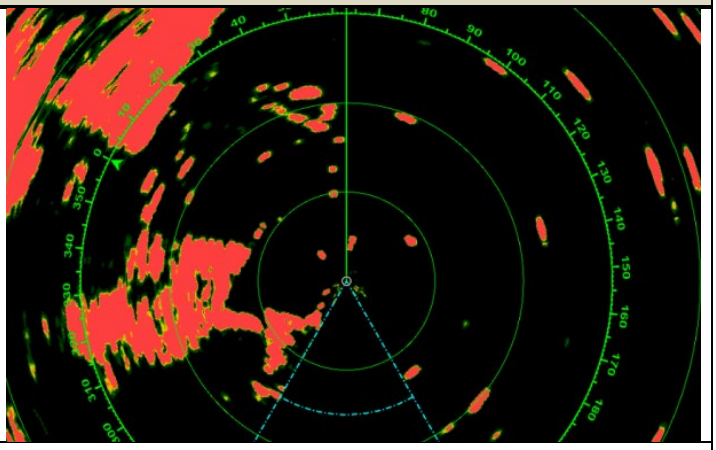
Range: 8 NM

RezBoost™ – Enhanced 3	RezBoost™ – OFF	DRS4DL+ (No RezBoost™)
		
Each target on the screen is sharpened.	The DRS2D-NXT with RezBoost™ turned off (left) and DRS4DL+ without RezBoost™ function (right) show fat or wide echoes as the targets are located farther.	

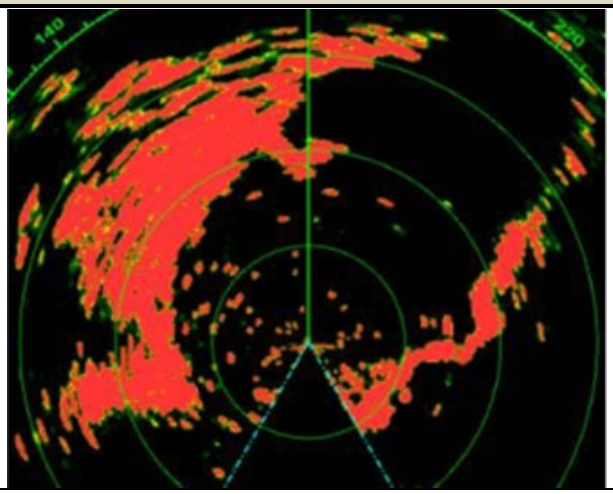
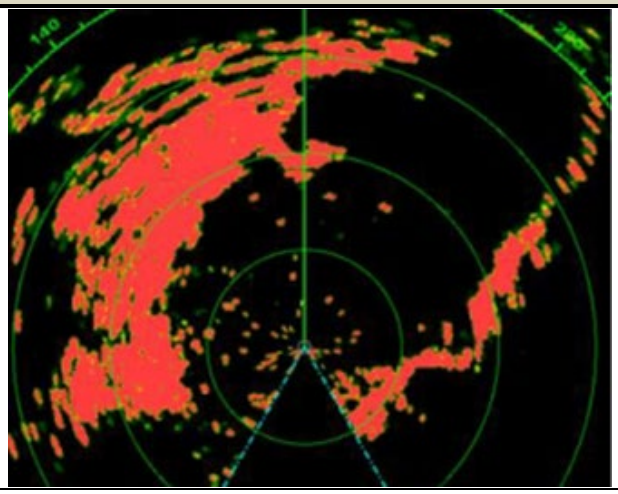
1.6. Comparing with DRS4DL+ and DRS4D-NXT

DRS2D-NXT	DRS4DL+
	

These screenshots show Osaka Bay in the 24 NM range scale. The Solid-State DRS2D-NXT is compared with the magnetron-type DRS4DL+; the DRS2D-NXT shows clearer coastlines inside Osaka Bay.

DRS2D-NXT – Target Analyzer	DRS4DL+
	

These images are from the area around the Kobe Airport in the 3 NM range scale. The DRS2D-NXT in Target Analyzer helps intuitively identify approaching and stationary targets around the airport.

DRS2D-NXT	DRS4D-NXT
	

The DRS2D-NXT shows similar images to the DRS4D-NXT in a long range scale of 24 NM. Due to the longer antenna, bearing resolution is superior with the DRS4D-NXT: The DRS4D-NXT shows echoes more sharply than the DRS2D-NXT.

2. Unique Functions and Advanced Presentation

The unique functions available with the Doppler signal processing and advanced presentations of models DRS4D-/6A-/12A-/25A-NXT are also available with the DRS2D-NXT. This section summarizes those functions: See **Sales Bulletin FSB21-0017** for detailed descriptions.

Target Analyzer – Target Mode and Rain Mode

As introduced in **Section 1.4 and 1.6**, the **Target Analyzer** feature allows you to easily identify moving or dangerous targets with **Target Mode** and **Rain Mode**: Approaching (moving) targets over 3 knots, rain, and other targets are color coded to make identification simple.

Notes:

(1) Targets with a radial velocity **over 50 knots (approx.)** may be shown in **GREEN** rather **RED**.

(2) While the Target Analyzer is turned on, the **Echo Average (EAV)** function is turned **off** and is **not** available.

Auto Acquire by Doppler

Targets in any direction in a 3 NM range can be automatically acquired and tracked.

Note:

Target with a radial velocity **over 50 knots (approx.)** may **NOT** be automatically acquired.

Quick Target Acquisition and 100 Target Tracking

Since the Target Analyzer and Auto Acquire by Doppler features are utilizing Doppler signal processing, the DRS2D-NXT can detect target motion instantly. This also allows for tracking of up to **100 ARPA targets**:

40 targets for Auto Acquire by Doppler, 30 targets for automatic tracking in guard zone, and 30 targets for manual tracking. These targets can be either manually or automatically acquired within a few seconds.

RezBoost™

RezBoost™ processing technology achieves equivalent bearing resolutions of longer antenna arrays by suppressing unnecessary echoes. This unique presentation is available with the DRS2D-NXT as introduced in **Section 1.5**.

Bird Mode

Bird Mode is available in combination with compatible NavNet MFDs: **Gain** settings will be set to **higher** values to **enhance echoes** and **detect birds**.

3. Specifications, Installation, and Interconnection

For specifications, installation information such as dimensions and cabling, and interconnection diagrams, refer to **Sales Bulletin FSB21-0017** that summarizes all the DRS-NXT series sensors, as well as retrofit from the DRS2D to DRS2D-NXT.

This document briefly explains an overview of specifications of DRS2D-NXT in comparison with the DRS4D-NXT (24 inch, Solid-State), DRS2D (19 inch, magnetron), and DRS4DL+ (19 inch, magnetron).

General and I/O	**DRS4DL+**	**DRS2D** (Discontinued)	**DRS2D-NXT**	**DRS4D** (Discontinued)	**DRS4D-NXT**
Transmitter	**Magnetron**	**Magnetron**	**Solid-state**	**Magnetron**	**Solid-state**
Transmission	Pulse	Pulse	Pulse compression	Pulse	Pulse compression
Output Power	4 kW	2 kW	25 W	4 kW	25 W
Antenna Size	19 in dome	19 in dome	19 in dome	24 in dome	24 in dome
Power Supply	12-24 VDC via ship's mains	48 VDC (via PSU/MFD 12-24 V)	12-24 VDC via ship's mains	48 VDC (via PSU/MFD 12-24 V)	12-24 VDC via ship's mains
Power Consumption*(1)	24 W / 10 W (TX/STBY)	20 W (less PSU) Approx. 44 W (w/PSU-017)	30 W / 12 W (TX/STBY)	24 W (less PSU) Approx. 48 W (w/PSU-017)	30 W / 12 W (TX/STBY)
Weight	5.7 kg	6.5 kg	6.5 kg	7 kg	7.3 kg
Protection Level	IP26	IP26 IP26	IP26		IP26
Compatible Display	NavNet TZtouch/2/3 MFDs (No NavNet 3D)	NavNet 3D and TZtouch/2/3 MFDs	NavNet TZtouch/2/3 MFDs (No NavNet 3D)	NavNet 3D and TZtouch/2/3 MFDs	NavNet TZtouch/2/3 MFDs (No NavNet 3D)
Performance					
Effective Horizontal Beam	-	-	**2.6** to 5.2° (by RezBoost™)	**-**	**2.0** to 3.9° (by RezBoost™)
Horizontal Beam Width	5.2°	5.2°	5.2°	3.9°	3.9°
Vertical Beam Width	25°	25°	25°	25°	25°
Antenna Rotation Speed	24 RPM	24/36/48 RPM	24/36/48 RPM	24/36/48 RPM	24/36/48 RPM
Maximum Range	36 NM	24 NM	48 NM	36 NM	48 NM
Minimum Detection Range	25 m	25 m	20 m	25 m	20 m
Range Resolution	25 m	20 m	20 m	20 m	20 m
SART, RACON	Available	Available	Within 0.5 to under 1 NM*(2)	Available	Within 0.5 to 1 NM *(2)
Dual Range	N/A	Available	Limited	Available	Available
ARPA Target Tracking	10 targets (Manual and automatic in guard zone)	30 targets (Manual and automatic in guard zone)	100 targets (40 × Doppler, 30 × guard zone, 30 × manual)	30 targets (Manual and automatic in guard zone)	100 targets (40 × Doppler, 30 × guard zone, 30 × manual)
Target Analyzer	N/A	N/A	Available	N/A	Available

Notes:

(1) The power consumption of DRS2D-NXT is the same as the DRS4D-NXT due to the common transceiver in use. The DRS4DL+ utilizes a simplified transmitter like the DRS4W and has a low consumption like Solid-State models even though a magnetron is used. The consumption of DRS2D-NXT is less than the DRS2D with PSU-017.

(2) See **Section 4.1** for details on limitations of SART and RACON detection.

4. Limitations

4.1. SART and RACON Detection

Compared with magnetron type Radar, the detection range of SART and RACON is shorter with Solid-State types due to less output power. Note that the actual detection range may be shorter or the frequency of detection may be less at the location where many vessels are transmitting Radar.

DRS2D-NXT : 0.5 to less than 1 NM
DRS4D-NXT and DRS6A-NXT : 0.5 to 1 NM (approx.)
DRS12A-NXT and DRS25A-NXT : 0.5 to 2 NM (approx.)

4.2. Dual-Range Display

In the dual-range display mode, there exist the same limitations found in other DRS-NXT series models.

Items	Limitations
Maximum range	Up to 12 NM
Antenna rotation speed	24 RPM only
Gain / Interference	**NOT** independent
Combination of different display modes	**NOT** available: The screens are in the same display mode, i.e. Bird Mode + Bird Mode, Target Analyzer + Target Analyzer

5. Compatible Displays and Versions

The DRS2D-NXT is compatible with NavNet TZtouch, TZTouch2, and TZtouch3 MFDs. Make sure that each MFD is updated to be compatible with the DRS2D-NXT.

Displays	Versions
NavNet 3D (MFD8/12/BB)	**NOT** supported
NavNet TZtouch (TZT9/14/BB)	**V6.03**
NavNet TZtouch2 (TZTL12F/15F/2BB)	**V8.01**
NavNet TZtouch3 (TZT12F/16F/19F)	**V2.01 and later**

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