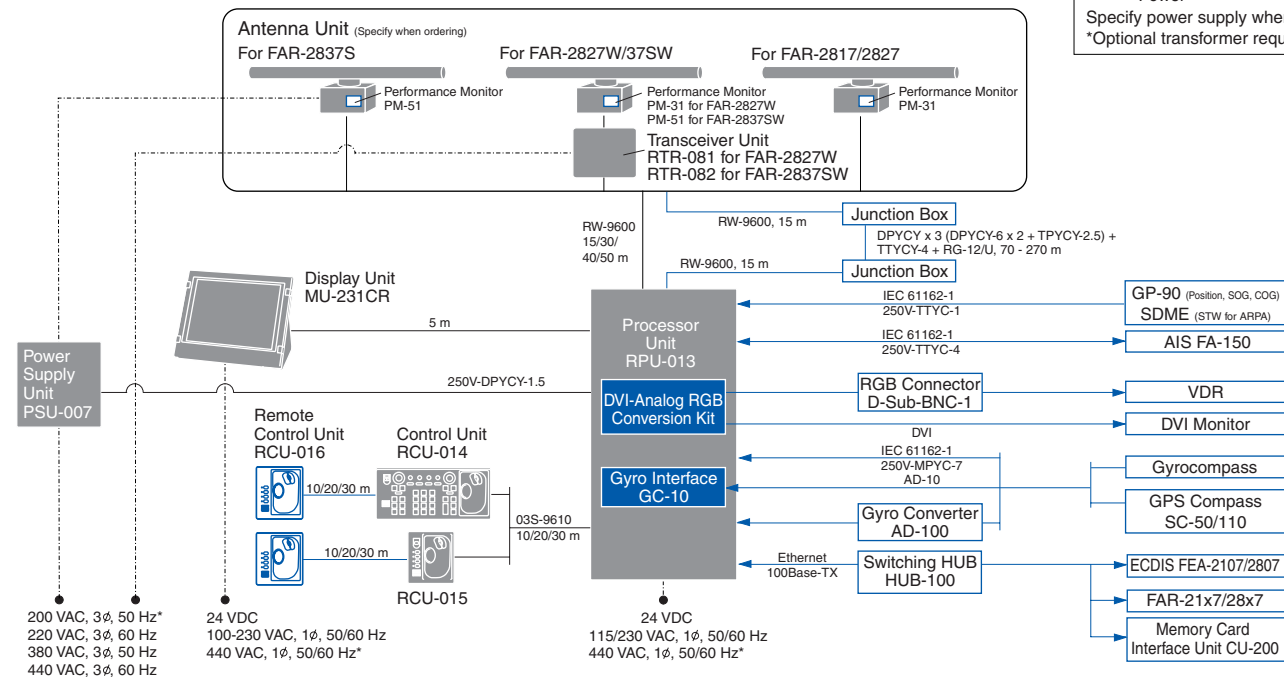
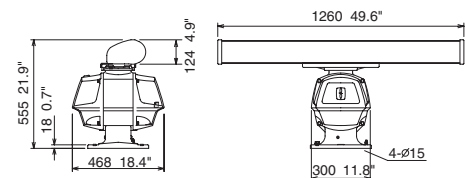


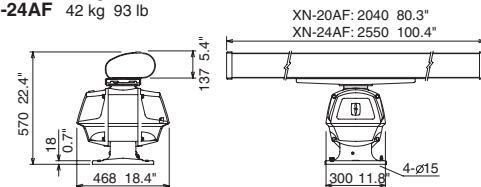
— Option or Shipyard Supply
 - - - - - Power
 Specify power supply when ordering
 *Optional transformer required



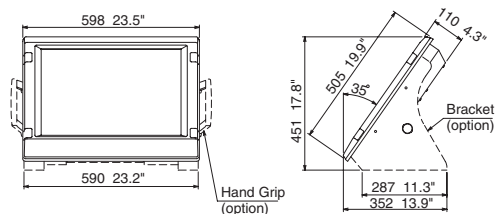
XN-12AF 33 kg 73 lb



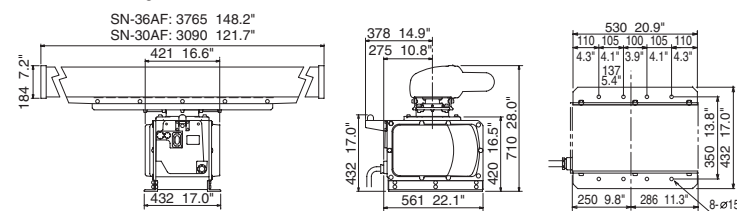
XN-20AF 39 kg 86 lb
XN-24AF 42 kg 93 lb



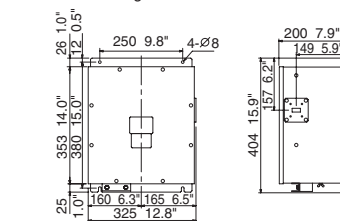
Bracket mount (exclude hand grips and bracket)



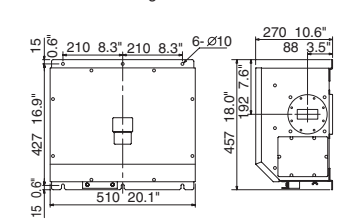
SN-30AF	127 kg	280 lb
SN-36AF	133 kg	293.2 lb



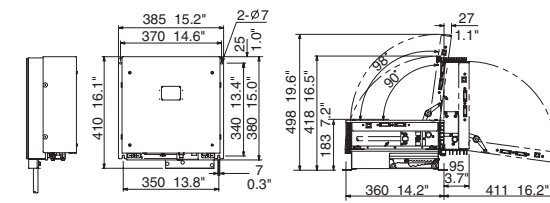
RTR-081 8.0 kg 17.6 lb



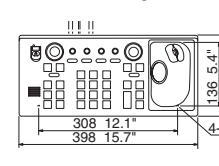
RTR-082 17.0 kg 37.5 lb



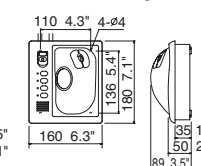
RPU-013 10 kg 22 lb



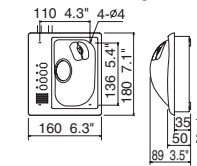
RCU-014 3.7 kg 8.2 lb



RCU-015 2.4 kg 5.3 lb



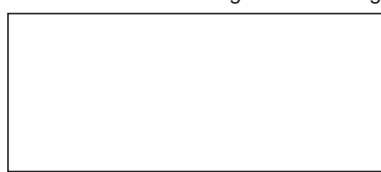
RCU-016 2.4 kg 5.3 lb



TRADEMARK REGISTERED
SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

FURUNO EURUS LLC
St. Petersburg, Russian Federation
Phone: +7 812 767 15 92
Fax: +7 812 766 55 52

09015U Printed in Japan
Catalogue No. R-184g



FURUNO

The logo for RADAR/ARPA features a large, stylized purple 'R' followed by the text 'ADAR/ARPA' in a bold, dark grey, sans-serif font. The background of the logo area is light blue with faint white line art depicting a map of the United States.

23.1" High resolution Multi-color LCD

FAR-28x7 series



FURUNODEEPSEA.com

**FURUNO has integrated leading-edge technology
with a user-friendly interface,
providing reliable performance and
simplified installation**

RADAR/ARPA
Automatic Radar Plotting Aid

The revolutionary FAR-28x7 series of X- and S-band, TR-up and -down radars are the result of FURUNO's 50 years of experience in marine electronics and advanced computer technology. This series is designed to meet the exacting standards of the International Maritime Organization (IMO) for all ships.

The display unit employs a 23.1" LCD which provides an effective picture diameter of larger than 340 mm. The high-resolution UXGA, digital flat-panel display unit provides crisp and clear radar images through a DVI interface. The DVI interface provides a pure digital video signal by using a digital signal for the entire path which maintains the image quality at the highest level, because the signal is not degraded as a result of a digital-to-analog conversion. The display has selectable color with a day and night background colors for clear presentation in all lighting conditions. Different colors are assigned for marks, symbols and text for easy observation.

Target detection is improved by sophisticated signal processing techniques featuring superb short-range detection. Two guard zones are provided as automatic acquisition zones for ARPA. One of two can be set at required ranges and any sector in any form. The FAR-28x7 series can display data about AIS-equipped ships, when connected with an AIS transponder. AIS enhances detection of other ships and AtoN (Aid to Navigation) on radar by displaying their movement and status with easy to read symbols and text.

The radar antenna is available with 4, 6.5, or 8 feet radiator. For the X-band, the rotation speed is selectable from 24 rpm for standard radars or 42 rpm for HSC. The S-band radar is also available with the antenna radiator of 10 or 12 feet. The S-band radar assures target detection in adverse weather where an X-band is heavily affected by sea or rain clutter.

**X-band antenna
for FAR-2817/2827/2827W**



8 ft antenna
(4 or 6.5 ft also available)

**S-band antenna
for FAR-2837S/2837SW**



10 ft antenna
(12 ft also available)

FAR-2817:	X-band, 12 kW, TR up
FAR-2827:	X-band, 25 kW, TR up
FAR-2827W:	X-band, 25 kW, TR down
FAR-2837S:	S-band, 30 kW, TR up
FAR-2837SW:	S-band, 30 kW, TR down



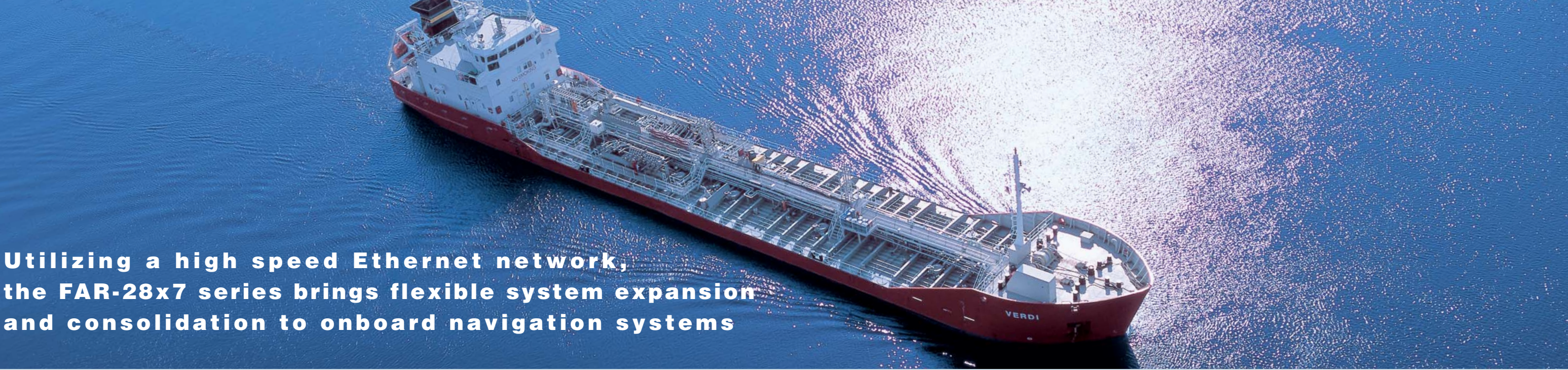
With optional mounting bracket
and connection stand

With optional white, slim pedestal

- ▶ Advanced signal processing for improved target detection
- ▶ High resolution UXGA LCD provides crisp radar images
- ▶ Complies with the existing IMO standards for all ships
- ▶ Low spurious magnetrons meeting ITU-R unwanted emission standards
- ▶ Up to four radars can be interswitched in the network without an extra device
- ▶ Automatic plotting/tracking of 100 targets manually or automatically acquired
- ▶ Displays 1000 AIS-equipped targets
- ▶ Easy operation by customizable function keys, trackball/wheel palm module and rotary controls
- ▶ Stylish streamlined design

**This series of radar complies with
the latest IMO and IEC regulations:**

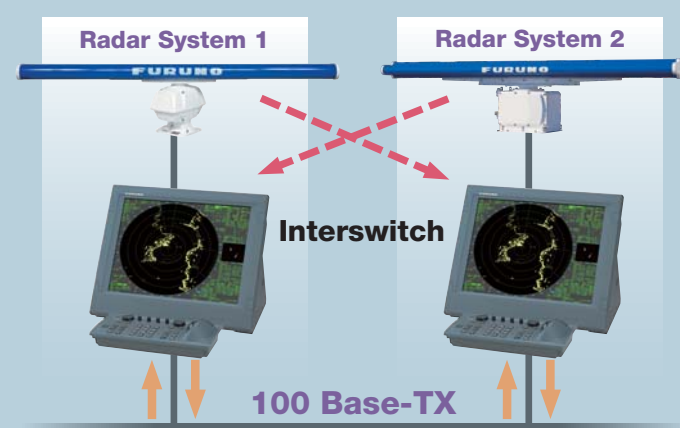
- | | |
|-------------------|-------------------|
| • IEC 60945 | • IEC 61162 |
| • IEC 62288 | • IEC 62388 |
| • IMO MSC.191(79) | • IMO MSC.192(79) |
| • IMO A.694(17) | • IMO A.813(19) |
| • IMO SN/Circ.243 | |



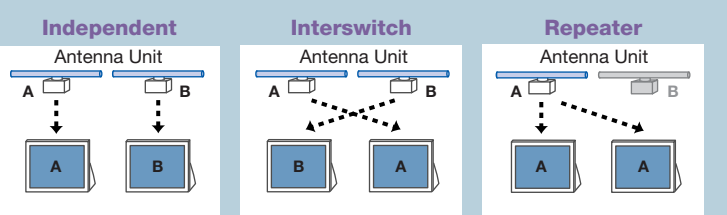
Utilizing a high speed Ethernet network,
the FAR-28x7 series brings flexible system expansion
and consolidation to onboard navigation systems

FEATURES of FAR-28x7 series

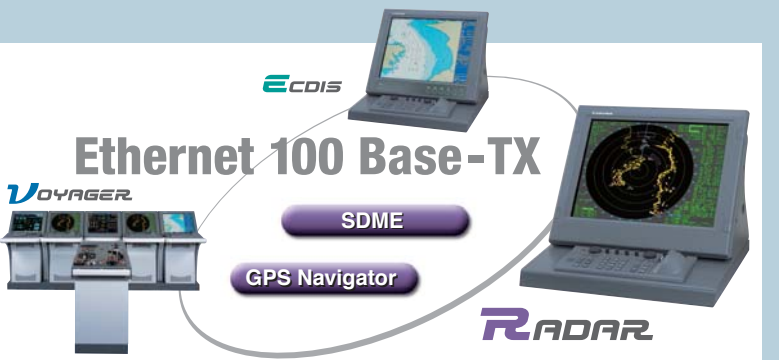
100 Base-TX Ethernet Network System



The radars can be connected to an Ethernet network for a variety of user requirements. Each of the X- and S-band radars can be interswitched without using an extra option. Up to four radars can be interchanged in the network. In addition, the essential navigational information including the electronic chart, L/L, COG, SOG, STW, etc. can be shared in the network.



The 100 Base-T Ethernet is utilized to link up to four sets of radar/ARPA FAR-21x7/28x7 with the ECDIS FEA-2107/2807. This link gives high-speed navigational data sharing within the system and allows operators to choose either a single station system or a total Integrated Navigation System (INS).



Stress-free operation with versatile control units



Full-keyboard type
The control head has logically arranged controls in a combination of push keys and trackball. Well organized menus ensure that all operations can be done by trackball.



Trackball type
Alternative to the Full-keyboard type or additional as a remote operation.

FUNCTIONS of FAR-28x7 series

ARPA/AIS

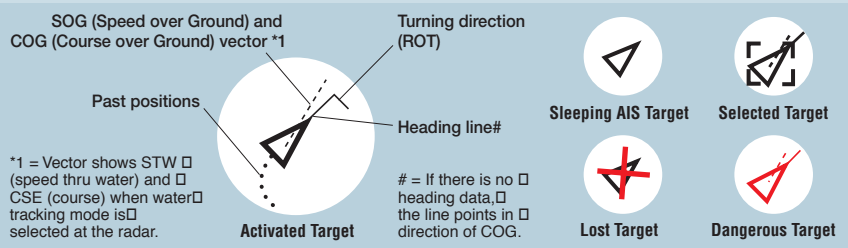


Target Association (Fusion)

An AIS-equipped ship may be displayed by both AIS and ARPA symbols. This is because the AIS position is measured by a GPS navigator in L/L while the ARPA target blip and data are measured by range and bearing from own ship. When the symbols are within an operator-set criteria, the ARPA symbol is merged with the AIS symbol. The criteria is determined by the differences in range, bearing, course, speed, etc.

Symbols for AIS

AIS COG/SOG vector changes its length with speed. ROT mark is viewable at the COG/SOG vector tip when a target ship is equipped with a FURUNO satellite compass SC-50/110 or gyrocompass which can talk ROT serial sentence.



Own ship data cell

DATA Cell 1

Tracking data

Water temp, Depth, Wind

DATA Cell 2

Tracking data

Zoom

DATA Cell 3

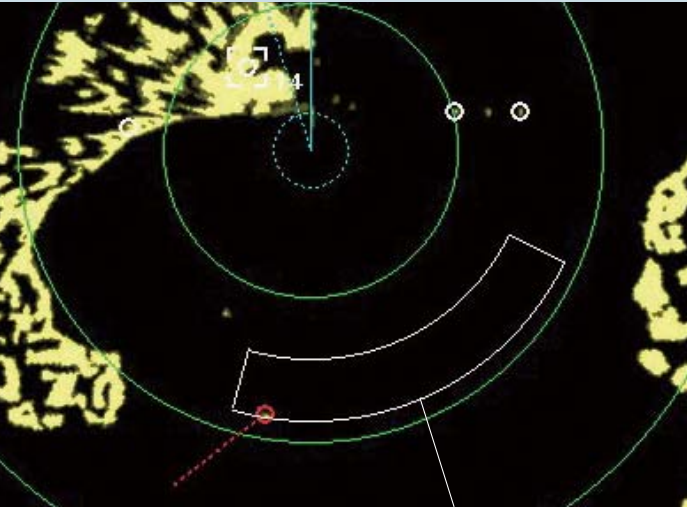
Tracking data

AIS Information

Data Display

A variety of navigational information, own ship status, radar plotting data, wind, water temperature and information from other shipborne sensors are displayed on the cells. The FAR-28x7 series has a unique zoom function, which enlarges a part of the radar image twice or three times in size.

Guard Zones



Guard Zones

Automatic Acquisition Zone

Two automatic acquisition zones may be set in a sector or any form. They also act as suppression zones, avoiding unnecessary overloading to the processor and clutter by disabling automatic acquisition and tracking outside them. Targets in an automatic acquisition zone are shown with an inverse triangle. The operator can manually acquire important targets without restriction.

Guard Zones and Anchor Watch Zone

Guard Zones generate visual and audible alarms when targets enter the operator set zones. One of the Guard Zones may be used as an anchor watch to alert the operator when own ship or targets drift away from the set zone.

CPA Alarm

The target tracking symbol changes to a triangle when its predicted course (vector) violates the operator set CPA/TCPA. The operator can readily change the vector lengths to evaluate the target movement trend.

Symbols for ARPA

Past positions

Initial stage

A vector appears to show a trend of movement.

Steady tracking

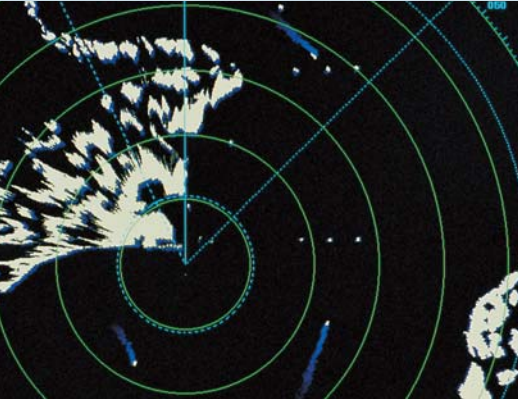
CPA alarm

Lost target (Flashing)

Past Position Display

The ARPA displays equally time-spaced dots marking the past positions of any targets being tracked. A new dot is added during preset time intervals until the preset number is reached. AIS also displays past position dots.

Target Trails



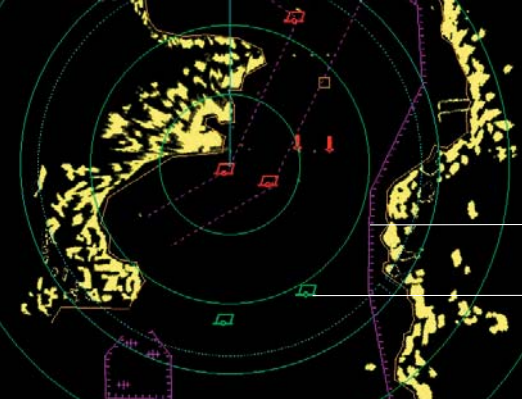
The target trails feature generates a monotone or gradual shading afterglow on all objects on the display. The trails are useful in showing own ship movement and other ship tracks in a specific fishing operation. The unique feature in this radar is a choice of True or Relative mode in Relative Motion (only True in TM). When changing modes, trails remain on the screen.

Chart Overlay



This radar incorporates a VideoPlotter that displays electronic charts, plots own and other ship's track, enables entry of waypoints/routes, and makes a radar map. The Radar targets are overlayed on the chart. (For non-SOLAS ships only)

Radar Map

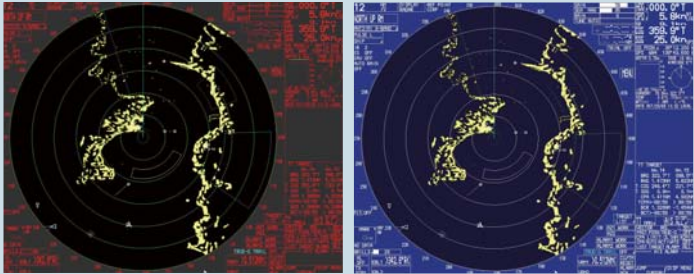


Lines

Marks

A radar map is a combination of lines and marks whereby the user can define and input the navigation area, route planning and monitoring data. The radar map can include up to 20,000 points for lines and marks. The map data can be saved to facilitate repeated use on a routine navigation area. Planned routes created on ECDIS can be transferred onto a radar display when interfaced with ECDIS.

Presentation Colors



Antenna Radiators

- 1. Type Slotted waveguide array
- 2. Beamwidth and sidelobe attenuation

Radiator Type	X-Band			S-Band	
	XN-12AF	XN-20AF	XN-24AF	SN-30AF	SN-36AF
Length	4 ft	6.5 ft	8 ft	10 ft	12 ft
Beamwidth(H)	1.9°	1.23°	0.95°	2.3°	1.8°
Beamwidth(W)	20°	20°	20°	25°	25°
Sidelobe (within ±10°)	-24 dB	-28 dB	-28 dB	-24 dB	-24 dB
Sidelobe (outside ±10°)	-30 dB	-32 dB	-32 dB	-30 dB	-30 dB

S-band 10 ft radiator usable for an HSC

3. Rotation

X-Band		
Rotation	24 rpm	42 rpm
Gear Box	RSB-096/103	RSB-097
S-Band		
Rotation	21/26 rpm	45 rpm
Gear Box	RSB-098/099/104/105	RSB-100/101/102

RF Transceiver

1. Frequency

X-band: 9410 MHz ±30 MHz
S-band: 3050 MHz ±30 MHz

2. Output power

	FAR-2817	FAR-2827	FAR-2827W	FAR-2837S	FAR-2837W
Output Power	12 kW	25 kW	25 kW	30 kW	30 kW
Transceiver	RTR-078	RTR-079	RTR-081	RTR-080	RTR-082

3. Pulselength/PRR

Range scale (nm)	Pulselength (μs)	PRR (Hz)
0.125, 0.25	0.07	3000
0.5	0.07, 0.15	3000
0.75, 1.5	0.07, 0.15, 0.3	3000, 1500
3	0.15, 0.3, 0.5, 0.7	3000, 1500, 1000
6	0.3, 0.5, 0.7, 1.2	1500, 1000, 600
12, 24	0.5, 0.7, 1.2	1000, 600
48, 96	1.2	600

- 4. I.F. 60 MHz, Logarithmic
- 5. Bandwidth Short pulse: 40 MHz
Middle pulse: 10 MHz
Long pulse: 3 MHz

RADAR DISPLAY

1. Display

23.1" color LCD (SXGA 1280 x 1024 pixels),
470 (H) x 353 (V) mm,
Effective display diameter: 340 mm
Echo Color: Yellow, green or white in 32 levels

2. Range scales and ring intervals (nm)

Range	.125, .25, .5, .75, 1.5, 3, 6, 12, 24, 48, 96
Ring	.025, .05, .1, .25, .25, .5, 1, 2, 4, 8, 16

3. Minimum range

30* m on 0.75 nm range scale
*Using a 10 m2 test target at 3.5 m high above sea and antenna at 15 m high (IEC 62388). Different conditions give a different result, maybe close to 20 m in actual installations.

4. Range discrimination

35 m

5. Range ring accuracy

1% of the maximum range of the scale in use or 30 m, whichever is the greater

6. Presentation modes

Head-Up, Course-Up, North-Up, North-Up TM

7. Heading information

GPS compass SC-50/110 is a recommendable heading sensor as a backup for a gyrocompass. Confirm if your Administrations permit its use.

8. Parallel index lines

1, 2, 3 or 6 lines (menu selectable)

9. Radar map

20,000 points to create coastlines, own ship safety contour, isolated underwater dangers, buoys, traffic routing systems, prohibited areas and fairways as required by IMO.

Automatic Plotting

1. Acquisition

100 targets (e.g., manually 50, automatically 50)

2. Tracking

Automatic tracking of all acquired targets in 0.1 to 32 nm

3. Guard zone (Target Acquisition Area)

Two guard zone, one of them 0.5 nm depth

4. Vector

True or relative, 30 s, 1, 3, 6, 12, 15, 30 min for prediction of target motion

5. Past positions

5 or 10 past positions at intervals of 30 s, 1, 2, 3, 6 min.

6. Collision warning

CPA limit: 0.2 - 10 nm, TCPA limit: 0 - 99 min.

7. Trial maneuver

Dynamic or static, with selected delay time.

AIS FUNCTIONS (Data input from AIS is required)

1. Symbols

Sleeping, Activated, Dangerous, Selected, Lost targets

2. Number of targets

1,000 targets max.

3. Data indication

Basic and expanded data

POWER SUPPLY (specify when ordering)

1. Processor Unit

24 VDC or 115/230 VAC, 1ø, 50/60 Hz
440 VAC, 1ø, 50/60 Hz with optional transformer RU-1803

2. Display Unit

24 VDC or 100-230 VAC, 1ø, 50/60 Hz
440 VAC, 1ø, 50/60 Hz with optional transformer RU-1803

3. Antenna Unit

FAR-2837S/2837SW:
200 VAC, 3ø, 50 Hz; 220 VAC, 3ø, 60 Hz; 380 VAC, 3ø, 50 Hz;
440 VAC, 3ø, 60 Hz; 110 VAC, 3ø, 60 Hz with RU-5693;
220 VAC, 3ø, 50 Hz with RU-6522;
440 VAC, 3ø, 50 Hz with RU-5466-1

EQUIPMENT LIST

Standard

- 1. Display Unit MU-231CR
- 2. Processor Unit RPU-013
- 3. Full-keyboard Control Unit RCU-014
Trackball Control Unit RCU-015
(Specify when ordering)
- 4. Antenna Unit with cable (15/30/40/50 m)
- 5. Power Supply Unit PSU-007 for FAR-2837S
- 6. Standard Spare Parts and Installation Materials

Option

- 1. Performance Monitor PM-31 for X-band, PM-51 for S-band
- 2. Remote Control Unit RCU-016
- 3. Gyro Interface GC-10
- 4. DVI-Analog RGB Conversion Kit OP03-180 (SXGA output)
- 5. RGB Connector DSUB-BNC-1 (for VDR)
- 6. Memory Card Interface Unit CU-200
- 7. Transformer RU-1803/5466-1/5693/6522
- 8. Rectifier RU-3424/1746B
- 9. Junction Box RJB-001
- 10. Antenna Cable RW-9600
- 11. Hand Grip FP03-09840
- 12. Bracket FP03-09820
- 13. Switching Hub HUB-100