

FURUNO

Multi-color High Performance **X/S-BAND BlackBox RADAR** DISPLAYING ARPA AND AIS TARGET INFORMATION Models **FAR-21x7-BB Series**

- 12, 25 kW T/R UP X-band, 30 kW S-band
- Supports non-interlaced SXGA (1280 x 1024) monitors with DVI-D input
- Presentation of very high-quality radar image by employing new Digital Video Interface (DVI) techniques
- Advanced signal processing for improved detection in rough seas
- Up to four radar sets can be interconnected in the network without an extra device
- Standard ARPA plotting/tracking of 100 targets acquired automatically or manually
- Displays up to 1,000 AIS-equipped targets
- Easy operation by customizable function keys, trackball/wheel palm modules and rotary knobs



Photo: Control unit with optional monitor MU-190HD



The finest BlackBox Radar you can own offers unmatched performance and a new user-friendly interface

FURUNO's FAR-21x7-BB series of X- and S-band BlackBox Radars are constructed with our finest commercial grade components and technology. These precision quality radar systems are designed for high end vessels and offer advanced target detection performance for safe navigation.

The BlackBox Radars work with virtually any size multi-sync SXGA (1280 x 1024) LCD or CRT monitor. Furuno also offers a premier line of high-quality LCD monitors that are a perfect complement to the FAR-21x7-BB Radar series. FURUNO's MU-155C is a high-resolution LCD monitor that features a variety of features and inputs, including 2 RGB analog, 1 DVI-D and 3 NTSC/PAL video inputs. Connecting a high-resolution SXGA monitor provides crisp radar images, which are presented in selectable colors with a

day and night background for easy observation in any lighting condition. Different colors are assigned for marks, symbols and text for user-friendly operation.

Target detection is enhanced by employing sophisticated signal processing techniques such as echo stretch, echo average and anti-clutter functions. With useful functions including ARPA, AIS target display, target trail, chart overlay and radar map, the operator can improve navigation efficiency and safety while cruising.

The radar antenna is available with 4, 6.5, or 8 ft radiator. For the X-band, the rotation speed is selectable from 24 rpm for standard radar or 42 rpm for high speed craft (HSC). The S-band radar is 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.



Courtesy of FERRETTI

Menu icons

Various menu options can be easily selected with the use of the trackball and scroll wheel. All of the settings are assigned to icons on the screen, which can be easily selected with single-hand operation.

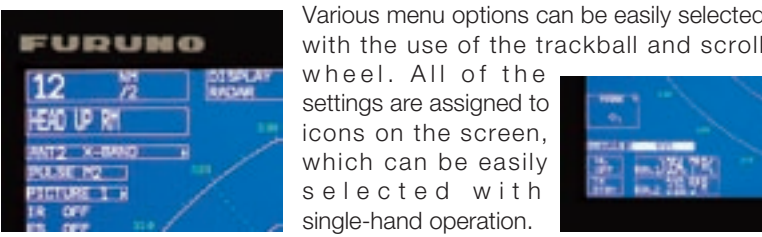
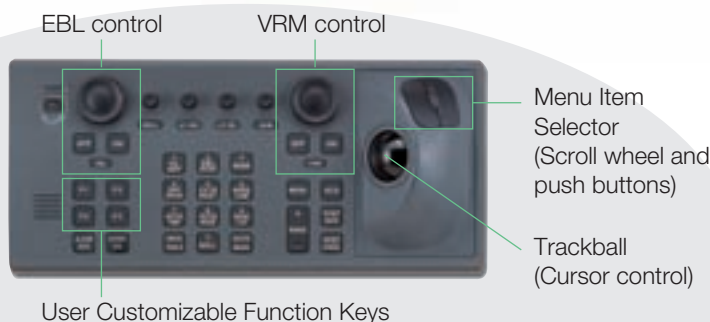


Photo: MU-150HD

The sunlight viewable MU-150HD is a 15" Color TFT LCD monitor and is an ideal match for the FAR-21x7-BB series. The monitor features 2 RGB analog, 1 DVI-D and 3 NTSC/PAL video inputs. Use the NTSC/PAL input for picture in picture (PIP).



EBL control

VRM control

Menu Item Selector (Scroll wheel and push buttons)

Trackball (Cursor control)

User Customizable Function Keys

Control Unit

An ergonomically designed control unit features a trackball, scroll wheel and operational push keys all organized in a functional and logical layout. A well organized menu structure ensures that all operation can be executed by trackball operation.

Trackball Control Unit

Use the Trackball Control Unit as a remote control for the main Control Unit, or as the main system controller for those helms with limited space.



S-band antenna



10 ft antenna
(12 ft also available)

FAR-2137S-BB: S-band, 30 kW, TR up

X-band antenna

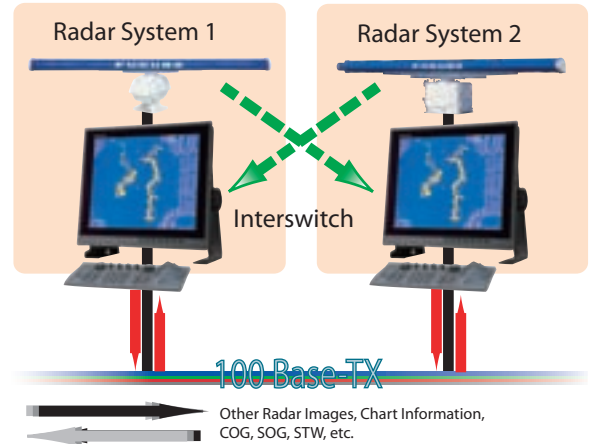


8 ft antenna
(4 or 6.5 ft also available)

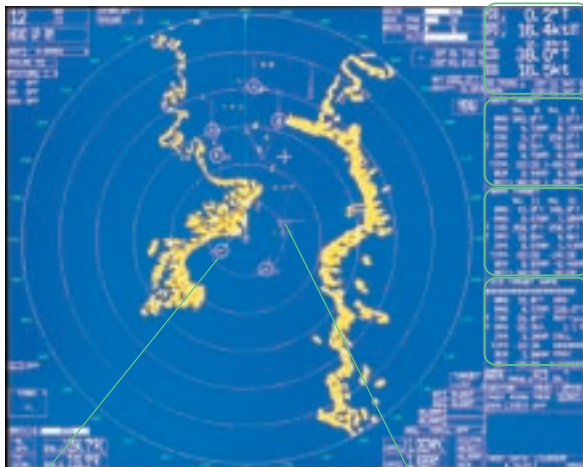
FAR-2117-BB: X-band, 12 kW, TR up
FAR-2127-BB: X-band, 25 kW, TR up

100 Base-TX Ethernet Network System

The radar can be connected to an Ethernet network for a variety of user requirements. Each of X- and S-band radars can be interconnected without requiring extra options. Up to four radar sets 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.



AIS / ARPA

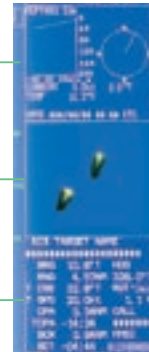


- Own Ship data cell
- DATA Cell 1
Tracking data
- DATA Cell 2
Tracking data
- DATA Cell 3
AIS Information

Water temp,
Depth, Wind

Magnify

AIS Information

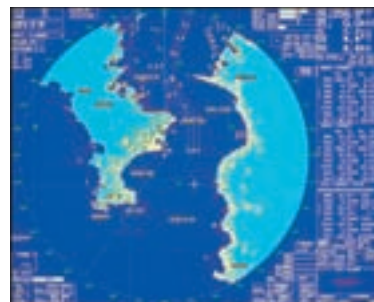


Automatically acquired targets

AIS-equipped target

A variety of navigational information, own ship status, radar plotting data, wind, water temperature and information from other shipborne sensors are displayed in the cells.

Chart Overlay



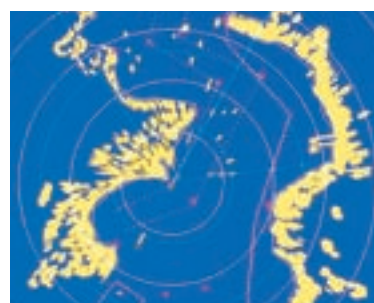
This radar incorporates a VideoPlotter that allows the user to display electronic charts (Navionics and Furuno Charts), plot own and other ship's track, enable entry of waypoints/routes, and make a radar map. A chart may be overlaid with the radar image. Optional card reader required.

Target Trails



The target trails feature generates monotone or gradual shading afterglow on all objects on the display. This feature is useful to show own ship movement and other ship tracks in a specific fishing operation. The trail time is adjustable at 30 seconds intervals or continuous.

Radar Map



Up to 200 waypoints and up to 30 routes can be stored. Each route may contain up to 30 waypoints. A radar map is a combination of map lines and marks. The radar map has the capacity of 20,000 points for lines and marks.

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 a HSC

3. Rotation

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

RF Transceiver

1. Frequency

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

2. Output power

	FAR-2117	FAR-2127	FAR-2137S
Output Power	12 kW	25 kW	30 kW
Transceiver	RTR-078	RTR-079	RTR-080

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 Unit (Locally arranged)

Type: Non-interlaced, Multi-sync monitor (DVI-D)
Resolution: SXGA (1280 x 1024 pixels)

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

4. Range discrimination

30 m on 0.75 nm range scale

5. Range ring accuracy

+0.2 %

6. Presentation modes

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

7. ARPA

Acquisition: 100 targets
Tracking: Automatic tracking of all acquired targets in 0.1 to 32 nm

8. AIS Display (Data input from AIS is required)

Targets: 1,000 targets

Power Supply (specify when ordering)

1. Processor Unit

24 VDC or 115/230 VAC, 1ø, 50/60 Hz,
7.6 A (FAR-2117-BB: 24 rpm at 24 VDC),
8.8 A (FAR-2127-BB: 24 rpm at 24 VDC)
440 VAC, 1ø, 50/60 Hz with RU-1803

2. Antenna Unit

FAR-2137S-BB:
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

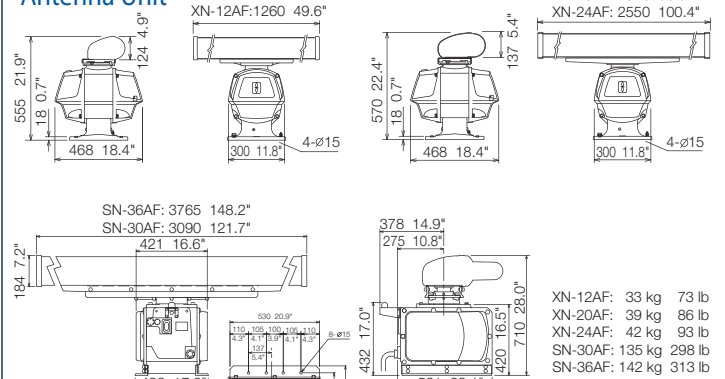
Standard

1. Processor Unit RPU-013 1 unit
2. Control Unit RCU-014 or Trackball Control Unit RCU-015 1 unit
(Specify when ordering)
3. Antenna Unit with cable, 15/30/40/50 m 1 pc
4. Power Supply unit PSU-007 for FAR-2137S 1 unit
5. Standard Spare Parts and Installation Materials

Option

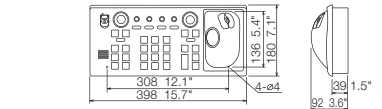
1. Performance Monitor PM-31 for X-band, PM-51 for S-band
2. Remote Control Unit RCU-016
3. Gyro Interface GC-10
4. DVI-Analog RGB Conversion Kit OP03-180
5. RGB Connector DSUB-BNC-1 (for VDR)
6. Chart/Memory Card Interface Unit CU-200-FAR
7. Transformer RU-1803/5466-1/5693/6522
8. Rectifier RU-3424/1746B
9. Junction Box RJB-001 (for expanded antenna cable, 100-300 m)
10. Antenna Cable RW-9600
11. Switching Hub HUB-100

Antenna Unit



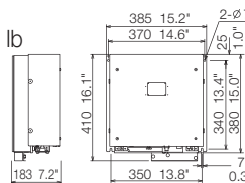
Control Unit RCU-014

3.7 kg 8.2 lb



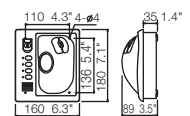
Processor Unit RPU-013

10 kg 22 lb

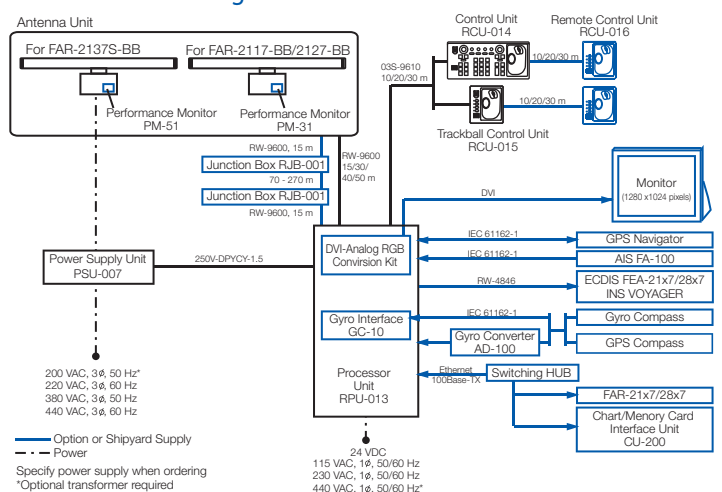


Trackball Control Unit RCU-015

2.4 kg 5.3 lb



Interconnection Diagram



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