Daylight-bright rasterscan 21-inch multi-color, high-resolution display

New microprocessing technology with high-speed, high-density gate array and software expertise

New cast aluminum scanner gearbox and new series of streamlined antennas

Easy operation by a combination of discrete keys, rotary controls, and menu operation, all logically arranged and configured

Electronic Plotting Aid (EPA) fitted as standard, Automatic Radar Plotting Aid (ARPA) option exceeding IMO and IEC standards

Reliable CPA and TCPA warning in any plotting mode, accurate target data

Optional 42 rpm scanner for high speed vessels

Meeting the new IMO and IEC requirements including:
- Radar Mapping capability to produce nav lines, aids to navigation, approximated coastlines and other features necessary for safe navigation
- Sea and ground stabilization
- True and relative vectors to determine future movement of other ships
- True and relative target trails
- Heading marker on the bearing scale, etc.
FR-2105 series X-band radars
FR-2115: X-band, 12 kW, TR up
FR-2125: X-band, 25 kW, TR up
FR-2155: X-band, 50 kW, TR up

The FR-2115/2125/2155 are designed for a wide range of users such as coasters, fishing boats, mega yachts, cargo and passenger ships, also high-speed craft or anyone requiring a high-resolution, high-refresh rate display in multi-color rasterscan.

The equipment is available in a variety of configurations: 12, 25 or 50 kW output, short or long antenna radiator, 24 or 42 rpm scanner, with standard electronic plotting facility and optional Automatic Radar Plotting Aid (ARPA). These plotting aids are essential in shipborne radar to reduce the workload of ship personnel and to improve the standard of collision avoidance.

The display unit employs a 21” high-resolution multi-color monitor which provides an effective diameter of 275 mm. Radar echoes are presented in a selected color with a day or night background color for easy observation under all lighting conditions. Different colors are assigned for marks, symbols and texts for user-friendly operation. The control head has logically arranged controls in a combination of push keys, rotary controls and a well-organized menu structure, and can be separated from the display unit via a flexible cable. The display pedestal contains all major modules and may be separated from the monitor part.

Operational features include all functions required by the IMO and IEC, such as, Head-up/Course-up/North-up orientation, parallel index lines, True Motion, sensor status message for compass, SDME, GPS and other electronic position-fixing systems, wind parameters, depth sounder data, etc. interfaced in IEC 61162.

Other features include two VRMs, range marker on the EBL, two EBLs with capability of offcentering and instant flipback, custom macro keys, multiple pulselengths, storage of operator-created maps, optional chart cards and the RP-26 Video Plotter module.

Complies with the following Regulations and Standards:
- IEC 60936-1 Shipborne radar
- IEC 60936-2 HSC radar
- IEC 60872-1 ARPA (with optional ARP-26)
- IEC 60872-3 EPA
- IEC 60945 General requirements
- IMO MSC.64(67) Annex 4
- IMO A.823 (19)
Reliability and Advanced Serviceability

Enhanced Serviceability

"Pull and lift" concept allows the service technician to easily see all surfaces of the display unit and the inside of the display base.

Radar Plotting Facilities

Target detection is enhanced by sophisticated signal processing techniques such as 16-level quantization, echo stretch, echo average, noise reducer, radar interference rejector.

The new IEC 60936 defines 3 types of radar plotting facilities: Electronic Plotting Aid (EPA), Automatic Tracking Aid (ATA), and Automatic Radar Plotting Aid (ARPA). All these Plotting Aids generate CPA and TCPA and collision alerts, complying with all IMO and IEC standards. The FR-2115/2125/2155 provide EPA and ARPA.

EPA (standard):
Electronic plotting of 10 targets in different symbols or colors

ARPA (Optional ARP-26 required):
Automatically tracks 30 targets which have been acquired manually or automatically, trial maneuverable, complying with A.823 (19).

Chart Display

Video Plotter RP-26 (optional)
The RP-26 offers the capability of superimposing the digitized chart over the real-time radar display. The chart may be instantly removed by a simple action (The radar display has the priority over the chart.) Photo by a simulator. Radar image in yellow tones, charts in blue with light brown in fill to show up the radar images day and night.

Map Area: 0.125 to 96 nm
Latitude Limits: Between 85°N and 85°S
Plot Interval: 10, 30 s, 1, 5, 10, 30 or 60 min
Built-in Memory: 6,000 points for ships track and marks, 98 waypoints, 25 routes
Tracking Speed: 120 knots max.
**SPECIFICATIONS OF FR-2115/2125/2155**

**ANTENNA RADIATOR**

1. **Type**
   - Slotted waveguide array

2. **Beamwidth**
   - FR-2115/2125 radiator
     - Radiator type: XN12AF, XN20AF, XN24AF
     - XN12AF: 1250, 49.2"
     - XN20AF: 2070, 81.5"
     - XN24AF: 2570, 101.2"
   - FR-2155 radiator
     - XN12AF: 1250, 49.2"
     - XN20AF: 2070, 81.5"
     - XN24AF: 2570, 101.2"

3. **Rotation**
   - 24 rpm or 42 rpm (option to FR-2115/2125 with XN12AF or XN20AF)

**RF TRANSCEIVER**

1. **Frequency**
   - X-band: 9410 MHz ± 30 MHz

2. **Output power**

3. **Pulse lengths and PRR**
   - FR-2115/2125: 12 kW, FR-2155: 50 kW

4. **Accuracy**
   - 1.25% of range in use or 15 m, whichever is greater

5. **Range scales**
   - P/L (μs): 0.125, 0.25, 0.5, 0.75, 1.0, 3, 6, 12, 24, 48, 96

6. **Radar map**
   - Antenna and display units
     - FR-2115/2125: 1250, 49.2" (XN12AF), 2070, 81.5" (XN20AF), 2570, 101.2" (XN24AF)
     - FR-2155: 1250, 49.2" (XN12AF), 2070, 81.5" (XN20AF), 2570, 101.2" (XN24AF)

7. **RF Antenna Size**
   - FR-2115/2125: 1250, 49.2" (XN12AF), 2070, 81.5" (XN20AF), 2570, 101.2" (XN24AF)
   - FR-2155: 1250, 49.2" (XN12AF), 2070, 81.5" (XN20AF), 2570, 101.2" (XN24AF)

8. **RF Output**
   - Power Supply
     - Unit PSU-001
     - FY-1000: 12 kW, FY-2200: 25 kW, FY-3500: 50 kW

9. **RF Pulse lengths**
   - FR-2115/2125: 12 kW, FR-2155: 50 kW

10. **RF PRR**
    - FR-2115/2125: 12 kW, FR-2155: 50 kW

11. **RF Interface**
    - Co-SpeVV-SB-C

12. **RF Gyro**
    - Gyro Interface

13. **RF Compass**
    - Compass (EPFS)

14. **RF Speed Log**
    - Speed Log

15. **RF Interswitch**
    - Interswitch

16. **RF Display Unit**
    - Display unit

17. **RF Option**
    - Performance monitor PM-30 (Relay Board Kit OP03-150 required)

**INTERCONNECTION DIAGRAM**

**DISPLAY UNIT**

- 61 kg, 134.5 lb

**POWER SUPPLY**

- Specified when ordering

**EQUIPMENT LIST**

1. Display Unit with Hand Grip
2. Antenna Unit
3. Power Supply Unit for FR-2155
4. Installation Materials and spare parts

**SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE**