MARINE RADAR EQUIPMENT

RADAR 3000

FIELD SERVICE MANUAL

JRC Japan Radio Co., Ltd.

C O N T E N T S

SECTION 1

SPECIFICATIONS

1.1 GENERAL

1. Maximum ranee: 24 Nautical Miles
2. Minimum ranee: Less than 25 m on the. 125 NM range
3. Ranee scales:

Range (NM)	Number of Rings	Ranee ring Interval(NM)
0. 125	2	0.0625
0.25	2	0.125
0.5	2	0.25
0.75	3	0.25
1.5	6	0.25
3.0	6	0.5
6.0	6	1.0
12.0	6	2.0
24.0	6	4.0

4. Range discriminations: Less than 25 m
5. Range rind accuracy: Better than ; ± 0.9% of maximum maximum range of the scale in use, or 8 m, whichever is the greater.
6. Bearing accuracy: ± 1 degree
7. Display device: CRT: 7" (640 x480 dots)
8. Environmental conditions:

Scanner unit	Temperature	- 15° C to +55° C
	Humidity	UP to 95% at 35° C
Display unit	Temperature	- 10° C to + 50° C
	Humidity	UP to 95% at 35° C

9. Input power: 10.2 V to 42V
10. Power consumption: 65 W
11. AVR: Floating AVR system

1.2 SCANNER UNIT

1. Dimensions:	Diameter	620mm
	Height	275mm
2. Weight:	Approx.	9.5 Kg
3. Polarization:	Horizontal	
4. Beamwidth:	Horizontal	4° nominal
	Vertical	25°
5. Sidelobes:	-21 dB or greater	
6. Rotation:	Approx. 27 rpm	
7. Transmitter frequency:	9410±30 MHz	
8. Peak power output:	4KW	
9. Pulse length/PRF:	0.08us/2250Hz (0. 125, 0.25, 0.5, 0.75 NM)	
	0.35us/1500Hz (1.5, 3. 6 NM)	

w

		0.7us/750Hz (3, 6, 12, 24 NM)
10.	Duplexer:	T-junction with diode Limiter
11.	Mixer:	MIC frontend
12.	IF amplifier:	Center frequency 60 MHz
		Bandwidth 3/10 MHz
13.	Noise figure	Less than 6 dB
14.	Characteristic	Semi-Log

1.3 DISPLAYUNIT

1.	Dimensions:	Width 276 mm
		Depth 250 mm
		Height 204 mm
2.	Weight:	Approx. 6 Kg
3.	Mounting:	Table, Overhead, or Flush mount
4.	Video:	8 levels quantitized
5.	Tuning:	Auto/ Manual
6.	Bearing scale:	360° scale graduated at intervals of 1°
7.	VRM:	3 digit readout
8.	EBL:	3 digit readout
9.	Alarm:	Audible alarm with zone mark
10.	Off Center:	2/3 radius
11.	Planned TX:	Rotation period 10, 20 or 30 scans
		Repetition period 3, 5, 10, 15 min.
12.	LANGUAGE:	English, Spanish, Norwegian
13.	Features:	VRM(2), EBL(2), Cursor with LL, Interference rejection, Target expansion, Target alarm, LL or TD readout, Waypoint with LL, Offset, Timed TX, Target Trail, Auto tune, Man Overboard
14.	External input:	
	NAV-AID	NMEA0183 (RMA, RMB, RMC, GLL, GTD, VTG, BWC sentence) NMEA0182
	Compass	NMEA0183 (HDM, HDT, VWH, or HSC sentence)

SECTION 2

TECHNICAL DESCRIPTION

2.1 GENERAL

The theory of operation for the Radar Set RADAR 3000 is presented here with descriptions following the functionalblock diagram circuits Figure 2-2.

2.2 RADOME ANTENNA UNIT

The Radome antenna unit consists of the RF PCB radiator, the motor /encoder assembly, radiator rotating mechanism, bearing reset assembly, and the transmitter/receiver units. These components are all housed within the 24.5" radome. The functional Block Diagram of Radome Antenna Unit appears in Figure 2-2.

2.2.1 RADIATOR

The RF PCB radiator forms the main RF transmitting beam for the radar tramsmitter and becomes the receiving antenna during the receive cycle. The beam formed by the phased array styled PCB at half power points is 4°horizontally and 25°vertically. The direction of the beam (maximum radiated power) is essentially perpendicular to the radiator surface.

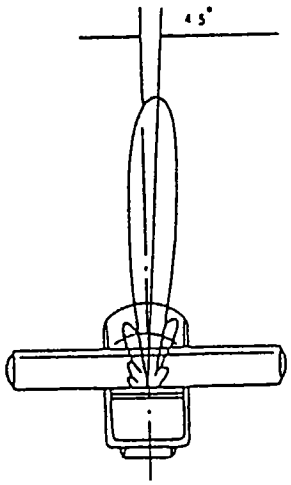

Fig. 2-1 RADIATOR PATTERN

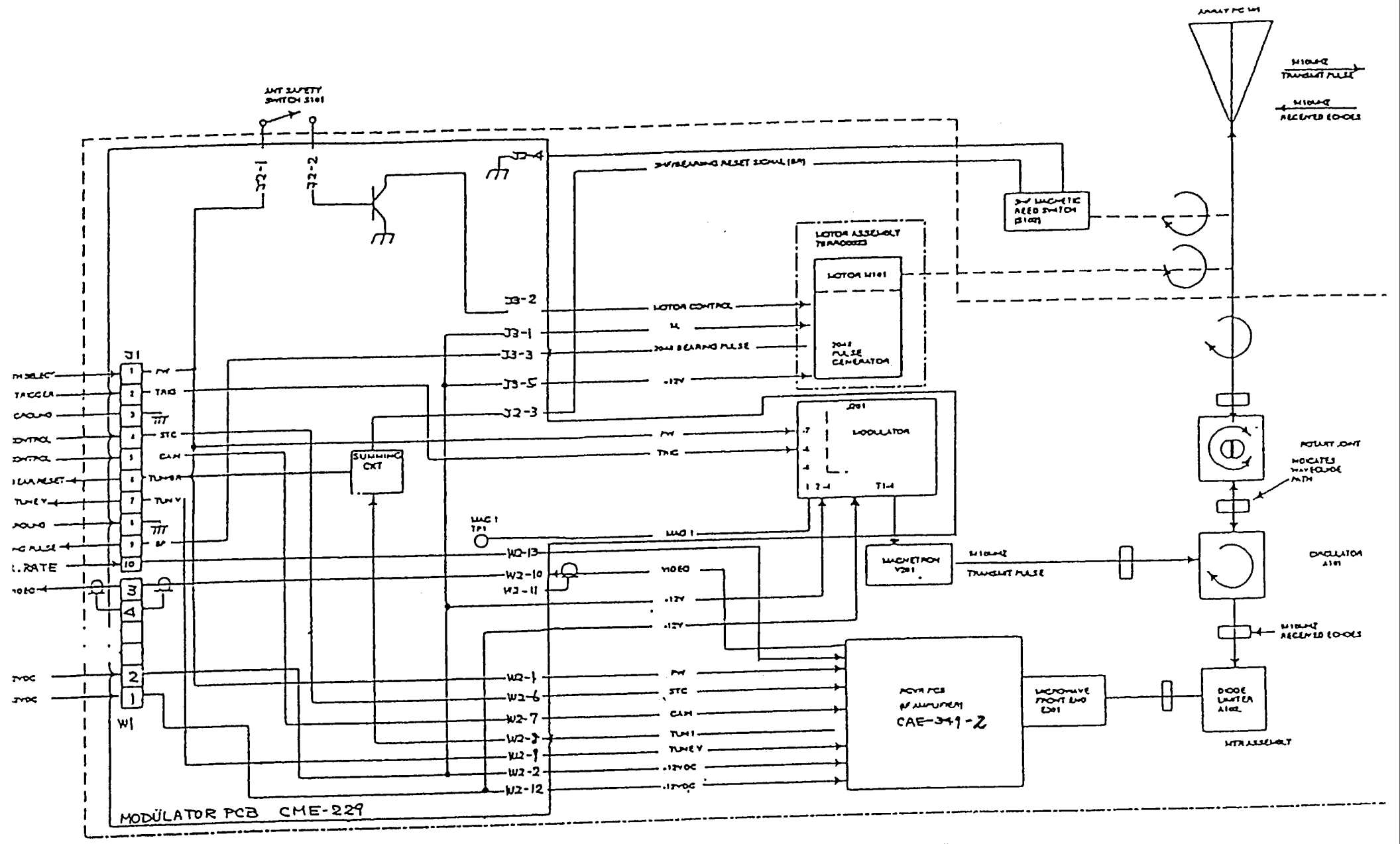

FIG. 2-2. BLOCK DIAGRAM OF RADOME SCANNER UNIT