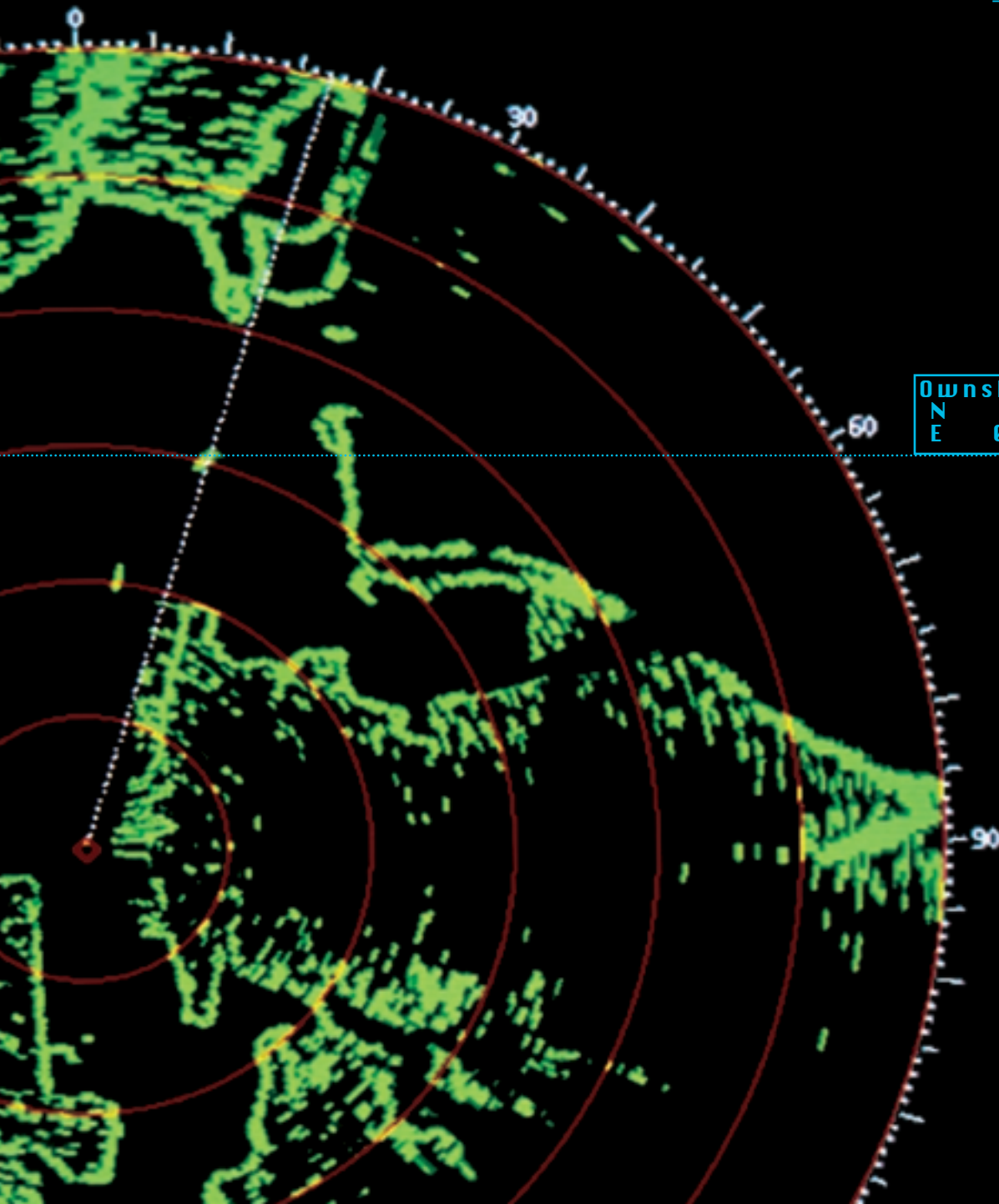


Raytheon

Leading the Way.

Pathfinder®/ST MK 2

Radar and
ARPA Systems



Ownship: Manual
N 54° 21' 45"
E 010° 08' 36"

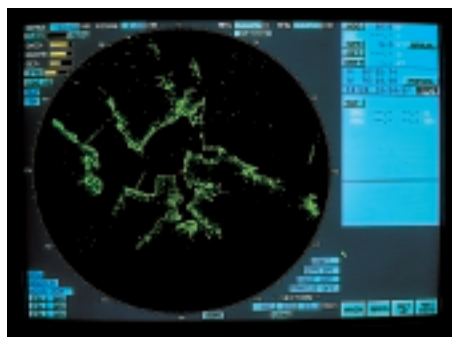
Introduction

The Pathfinder®/ST MK 2 line of ATA and ARPA radars represents the latest innovations in Raytheon's half century history of superb commercial marine electronic products.

Pathfinder®/ST MK 2 Radar systems combine innovative features such as Raytheon's patented signal processing technology, high performance transceivers, and extensive navigation tools together with an intuitive operating interface. This combination yields unmatched capability, performance, and long term reliability to meet your navigation requirements. The Pathfinder®/ST MK 2 complies with the new IMO Resolutions A.823 (19), A.694 (17), and MSC 64 (67) Annex 4. The systems are type approved acc. to MED 96/98/EC.

Pathfinder®/ST Family

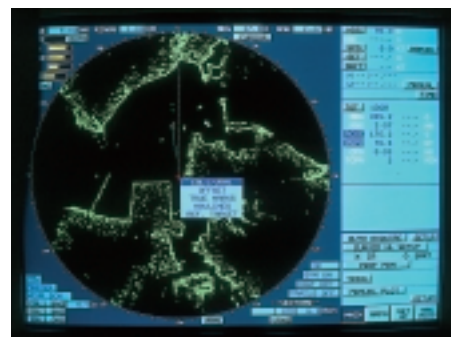
The Pathfinder®/ST MK 2 is the 2nd generation of *Superior Technology* IMO radars that have proved to be unmatched in performance, user acceptance and reliability. With a variety of selections including: 3cm and 10cm transceivers up or down, standard or high resolution color displays in IMO 250mm or 340mm configurations, ARPA or ATA, the Pathfinder®/ST MK 2 will continue as the premier product for the high seas fleet. Existing Pathfinder®/ST adaptive interface options allow the MK 2 displays to be easily back-fit to other radar transceivers, Raytheon or other makes.



Uncluttered screen: the operator can remove unnecessary information from the screen to make indications easy to read



Direct access to parallel indexing lines



Direct access to essential functions via pop-up menu: „Doesn't let you lose focus on your target.“



Autopilot Remote
Control Panel (Option)

Features

- Flexible console design for integrated bridge, stand-alone or table top applications
- Color displays available in standard or high resolution
- Easy to use with combination of traditional dedicated controls and point-and-click menu operating system
- Superior target detection and clutter suppression including patented "rain rate process"
- ARPA manual and automatic acquisition of up to 40 targets
- Dual EBL, VRM and parallel index lines as standard
- True Motion, gyro and log interface built-in, 4 programmable NMEA input/outputs
- 25kW X-Band transceivers in up or down configuration
- 30kW S-Band transceivers in up or down configuration
- High Performance Log Receiver with 130dB dynamic range
- Sector blanking
- Parallel index lines
- Nav interface alarm
- World wide sales and service support
- **Two years warranty**

Integration with Autopilot (Option)

The Autopilot Remote Control Panel is used in connection with the Raytheon Anschütz track controller or the autopilot NautoPilot® 2030 for One-Man-Bridge Operation (DNV-W1, OMBO). The following functions are then possible:

- Remote control of track control mode
 - starting/stopping of track control
 - selection of initial waypoint
- Remote control of the autopilot from the radar
 - setting actual course
 - setting radius
 - release of planned action
- Override function for the collision avoidance manoeuvre
- Display of status of the selected control mode (course-, track control)
- Information and menu guidance on the radar screen



Display consoles ergonomically
designed for stand-alone installations
and Integrated Bridge System.



Extensive Optional Features

Performance Monitor - Both X- and S-Band performance monitors in compliance with all known performance requirements are available.

Interswitch Unit - The interswitching function allows for the interswitching of up to 4 transceivers and 4 displays.

High Speed Kit - A high speed 40rpm option kit is available for use with 7 and 9ft. X-band antenna pedestals/arrays in compliance with IMO Resolution A.820(19) Performance Standards for navigational Radar equipment for high-speed craft.

Autopilot control panel.

Alarms for One Man Bridge System.

Radar/ECDIS Overlay - SENC on radar screen and radar video image displayed on Raytheon MK2 ECDIS screen.

Navline Maps - Navline maps are an optional feature on ATA displays (standard on ARPA displays).

External Map Storage - Maps can be stored externally on transportable PCMCIA cards.

Adaptive Interface - Allows Pathfinder®/ST MK2 display to connect to other radar transceivers.

Interswitch Adaptive Interface - Allows interswitching of Pathfinder®/ST MK2 Radar display with previous generation Pathfinder®/ST display.

Deck Stand

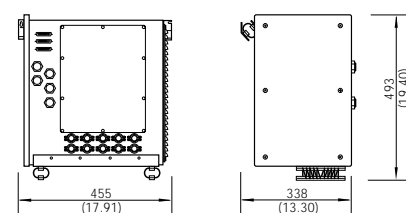
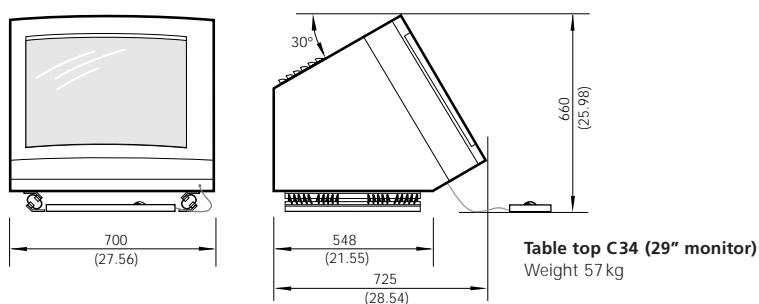
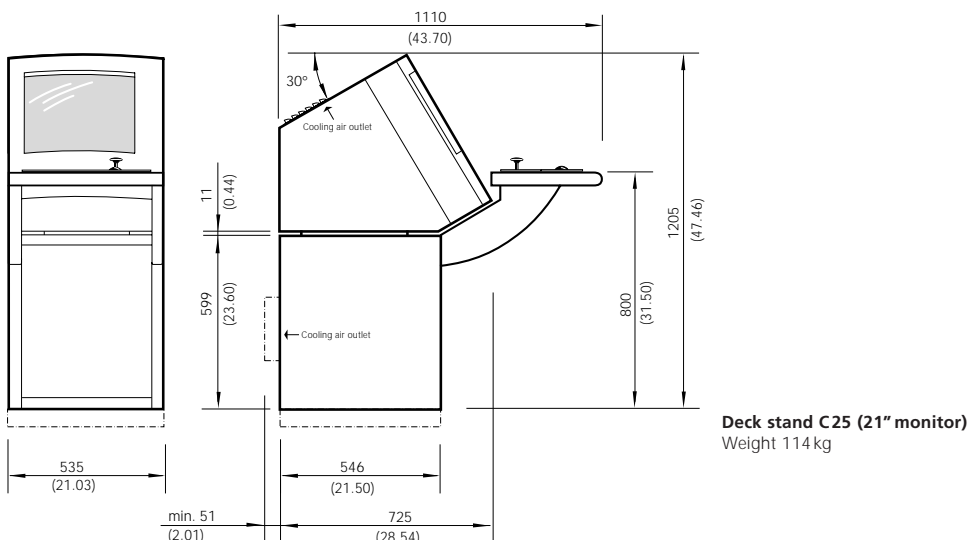
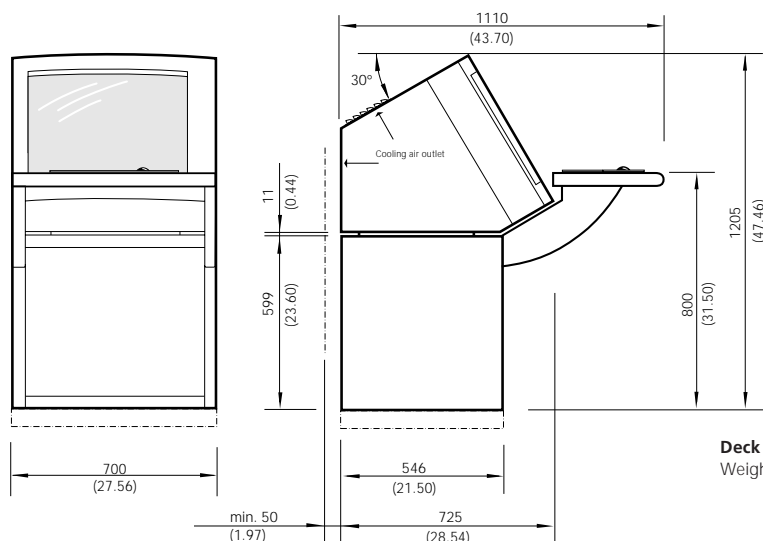
Remote Trackball

← **XVGA output for external monitor**

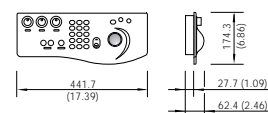
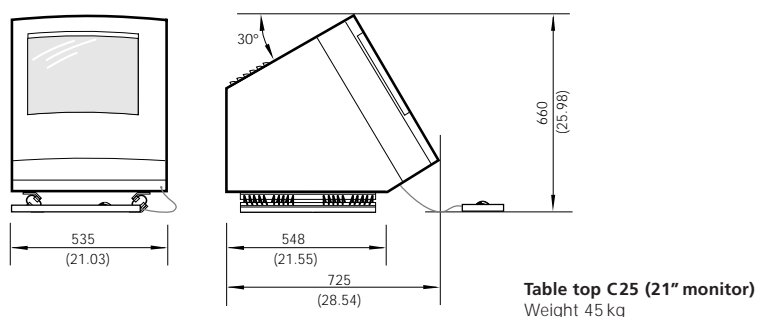


Example for external monitor

Pathfinder®/ST MK2 Dimensions



MK2 Radar Processor
Weight: 19 kg



Radar Control Panel
Weight: 3.18 kg

Dimensions in mm (inches)

Technical Specifications

Display C25M

C34M/H

		med. res.					high res.				
CRT Size (diameter/inch)	21	29					29				
PPI Diameter (inch)	12 (250mm)	16 (340mm)					16 (340mm)				
	273mm viewable	362mm viewable					362mm viewable				
Colors	16	16					16				
Resolution	768x1024	768x1024					1024x1280				
Dot Pitch (mm)	0.28mm	0.75mm					0.37mm				
Range Scales (NM)	0.25 0.5	0.75	1.5	3	6	12	24	48	96		
Range Rings Interval (NM)	0.125 0.125	0.125/0.25	0.25	0.5	1.0	2.0	4.0	8.0	16		
Number of Rings	2 4	6 / 3	6	6	6	6	6	6	6		
Minimum Range (m)	25										
Maximum Range (NM)	96										
Range Resolution	0.3% or 3.6 m, whichever is greater										
Range Accuracy	0.3% or 6.4 m, whichever is greater										
Bearing Resolution	0.3 degree absolute										
Bearing Accuracy	better than 1 degree										
EBLs	2, one centered, one floating										
VRMs	2 ownship centered										
Parallel Index Lines	2, adjustable bearing and offset										
Cursor	Range/Bearing, Lat/Long, Time to go and ETA										
Display Presentations	True or Relative Motion										
Display Bearing Modes	Head-up, North-up, Course-up in true or relative motion										
Gyro Input	Synchro (360X, 180X), Step (6 or 12 steps/degrees) or Serial interface										
Speed Log	Pulse/Contact 100-2000 PPNM or Serial interface										
Input/Output Ports	4 user-configurable NMEA input/outputs										
Footprint, WXD (inch)	21x21.5	27.5x21.5									
Voltage Requirements	115/220 VAC 50/60Hz 115/220 VAC 50/60Hz										
Power Requirements	200 VA	350 VA				350 VA					

Antenna / Pedestals

R A N G E 6 . 0 N M

	X-Band			S-Band
	7 ft.	9 ft.	12 ft.*	12 ft.
Horizontal Beam Width (deg.)	1.0	0.9	0.7	1.9
Vertical Beam Width (deg.)	23.0	23.0	23.0	23.0
Gain (dB)	29	30	32	28
Polarization	horizontal			
Rotation Rate (RPM)	22-24, 50/60Hz (optional 40, RPM 7,9 ft X-Band only)			
Wind Load (kts)	100kts operation, 150kts survival			
Voltage Requirements	115/230 V AC, 1ph, 50/60Hz or 220/380-460 V AC, 3ph, 50/6Hz			
Power Requirements	700 VA (max.)		1400VA (max.)	
Swing Circle (inch)	92	116	151	150
Swing Circle (mm)	2336	2946	3836	3810

* for e.g. Vessel Traffic System application
(not type approved for maritime use)



ARPA

Number of Targets	40
Acquisition	Manual or Automatic with guard zones/sectors
Vectors	Selectable: True or Relative point of possible collision and CPA point display
Designated Target	2-target readout includes: Range/Bearing, Course/Speed, CPA/TCPA, Bow Crossing, Distance/Time
Alarms	Dangerous target, Guard zone, Lost target

Transceiver

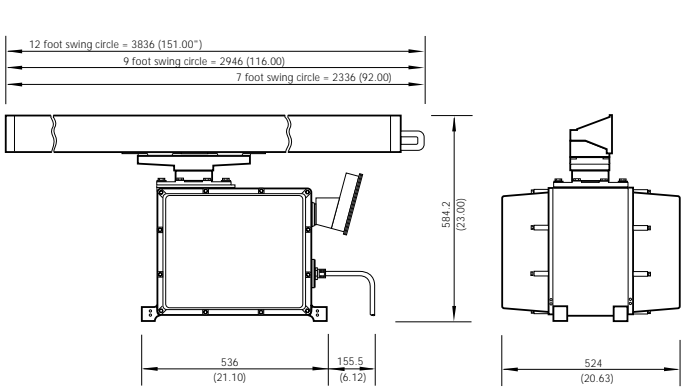
Transmitter	X-Band (3 cm)		S-Band (10 cm)	
	MTR up	MTR down	MTR up	MTR down
Height** (inch)	18.5	25.06	23.75	28
Width** (inch)	20.6	21.82	22.13	21.82
Depth** (inch)	21.10	13.5	23.35	13.5
Voltage Requirements	115/230 VAC, 1ph		115/230 VAC, 1ph	
Power Requirements	250 VA		250 VA	
Peak Power (kW, typ.)	25	25	30	30
Frequency (MHz)	9410 ± 30		3050 ± 30	
Wavelength (cm)	3.2		10	
Receiver IF (MHz)	60 log		60 log	
Receiver Noise (dB)	5.5		5.0	
Dynamic Range (dB)	130		130	
Band Width (MHz)	22.5 short pulse, 5 on med/long			
	short	med 1	med 2	long
Pulse Width (μsec)	0.06	0.25	0.5	1.0
PRF (Hz)	3000	2000	1000	750
Receiver BW (MHz)	25	4	4	4

**without antenna.....

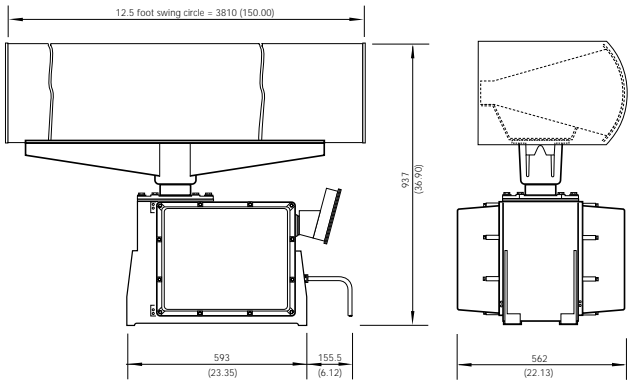
Abbreviations

ATA	Automatic Tracking Aid	ISO 9001	International Standardization Organization Quality System
ANTS	Automatic Navigation and Trackkeeping System	MITS	Maritime Information Technology Standard
ARCP	Autopilot Remote Control Panel	NMEA	National Marine Electronics Association
ARPA	Automatic Radar Plotting Aid	OMBO	One Man Bridge Operation
CPA	Closest Point of Approach	PCMCIA	Personal Computer Memory Card International Association
CTS	Course To Steer	SENC	System Electronic Navigation Chart
DNV	Det Norske Veritas	TCPA	Time to Closest Point of Approach
DNV W1	One Man Operation	TM	True Motion
EBL	Electronic Bearing Line	TTG	Time To Go
ECDIS	Electronic Chart Display and Information System	VRM	Variable Range Marker
ETA	Estimated Time of Arrival	WOP	Wheel-Over Point
IBS	Integrated Bridge System	XTD	Cross Track Distance
IEC	International Electrotechnical Commission	XTE	Cross Track Error
IMO	International Maritime Organization	XVGA	Extended Video Graphic Adapter

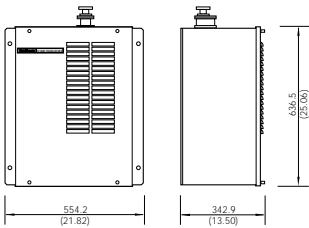
Dimensions



X-Band Pedestal
Weight pedestal 65 kg
Weight including 12-Foot antenna 78 kg
Weight including 9-Foot antenna 75 kg
Weight including 7-Foot antenna 73 kg



S-Band Pedestal
Weight pedestal 87 kg
Weight including 12-Foot antenna 141 kg



MK2 Radar Transceiver (down version)
Weight X-Band 29.5 kg
Weight S-Band 36.0 kg

Distributed by:

REL
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NautoPilot® - Raytheon Marine GmbH

Dimensions in mm (inches)
Subject to alteration due to technical developments without notice.

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