Covered in this chapter:
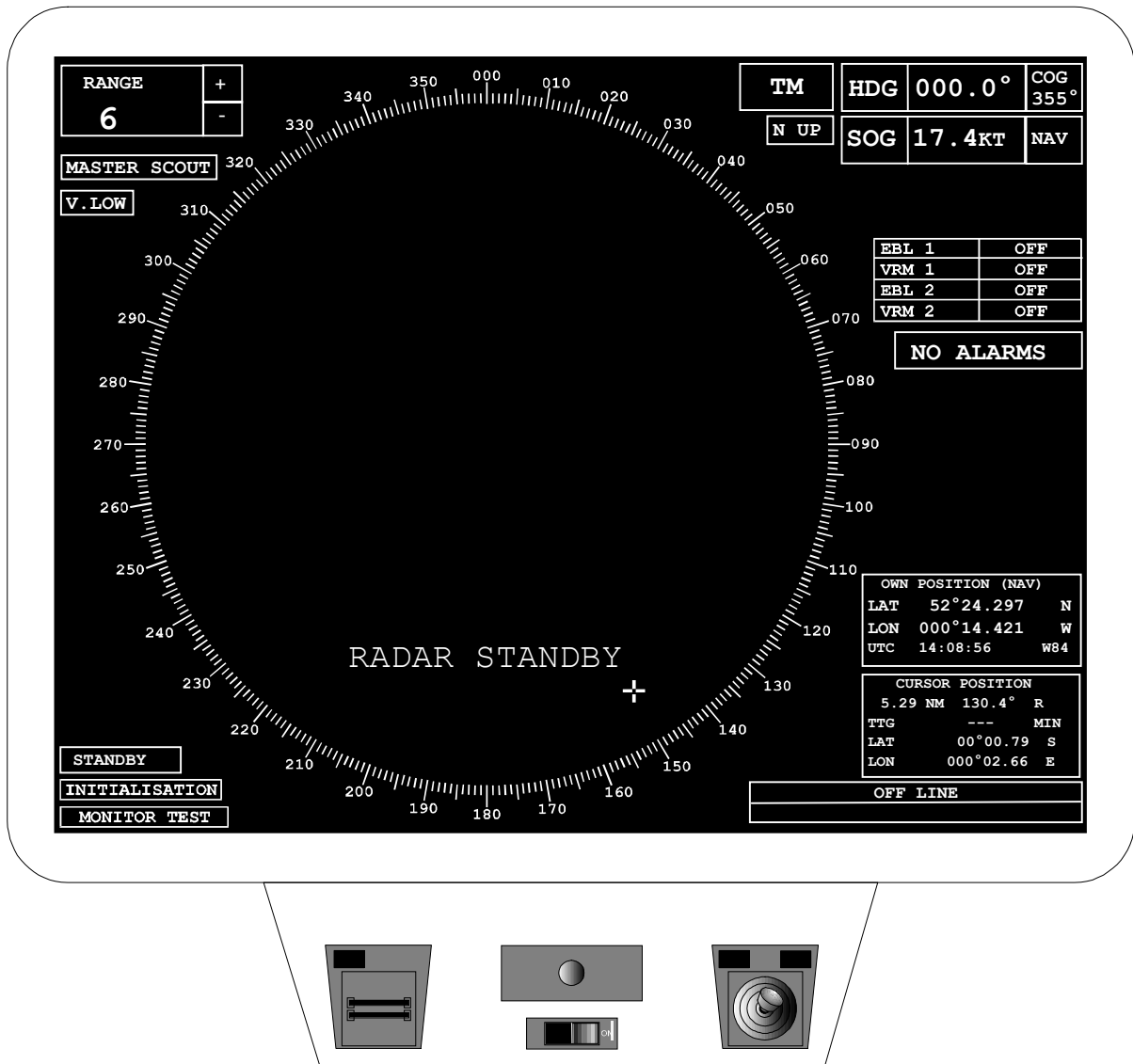
- The basic system.
- The interswitched system.
- Control panels.
- Systems features.

System Components

The major components of The Hellenic Navy Combattante III Navigation Radar
System installation (see Figure 1.1) are as follows.

Display Unit	
2 Colour Displays	250mm ARPA Displays
Control Panel	Simple Control Panel (with trackerball and memory card reader)
Scanner Unit	
Antenna Unit	3cm X-Band part of SCOUT LPI Radar
Turning Unit	SCOUT LPI Radar
Transceiver Unit "A"	SCOUT LPI Radar Transceiver
Transceiver Unit "B"	25kW 3cm X-Band Pulse Transceiver
Transceiver Compatibility Unit	
Interswitch Unit	Two way Interswitch
Video Control Unit	

*The dimensions given in mm relate to the diameter of the video circle.

There will also be a Scanner Control Unit for switching the SCOUT radar ON and
OFF, a MAN ALOFT switch to isolate ship's mains to the two transceivers and the
Turning Unit, Mains Isolation switches to isolate ship's mains from the displays
and Pulse Radar Transceiver.

System Overview

The system consists of two transceivers feeding a common scanner unit via a
waveguide change over switch.

Transceiver "A" (SCOUT) is an FMCW transceiver, transceiver "B" (NAV) is a
conventional high power pulse transceiver.

The SCOUT transceiver offers a low probability of intercept, with a greatly
reduced intercept range for ESM equipment and radar warning receivers.

The SCOUT transceiver is restricted to a maximum range of 24nm, and cannot
trigger some navigation aids such as SART's and RACONS.

The NAV transceiver provides the longer range coverage, and compatibility with
the navigation aids.

Only one transceiver can be active at a time, the waveguide switch automatically
selects the active transceiver to be coupled to the scanner unit.

The choice of active transceiver will be dependent on the operating scenario.
Two display units, and the Ship's Command system are connected via an
interswitch to the active transceiver.

Selection can be made at either display unit to configure it as a **master** or **a slave** or display.

It is only the **master** display unit that controls the transceiver functions.

Only one display can be **master** at a time.

Only one display can be **slave** at a time.

The functions that can be controlled from the Master display but NOT from the Slave display, are as follows:

Pulse Radar Transceiver Selected
- selection of transmission pulse length
- tuning the transceiver
- control of the transmitter Standby/Transmit function
- tuning the performance monitor

SCOUT LPI Radar Selected
- selection of transmission frequency
- selection of transmitter power
- control of the transmitter Transmit On/Off function
- selection of STC setting
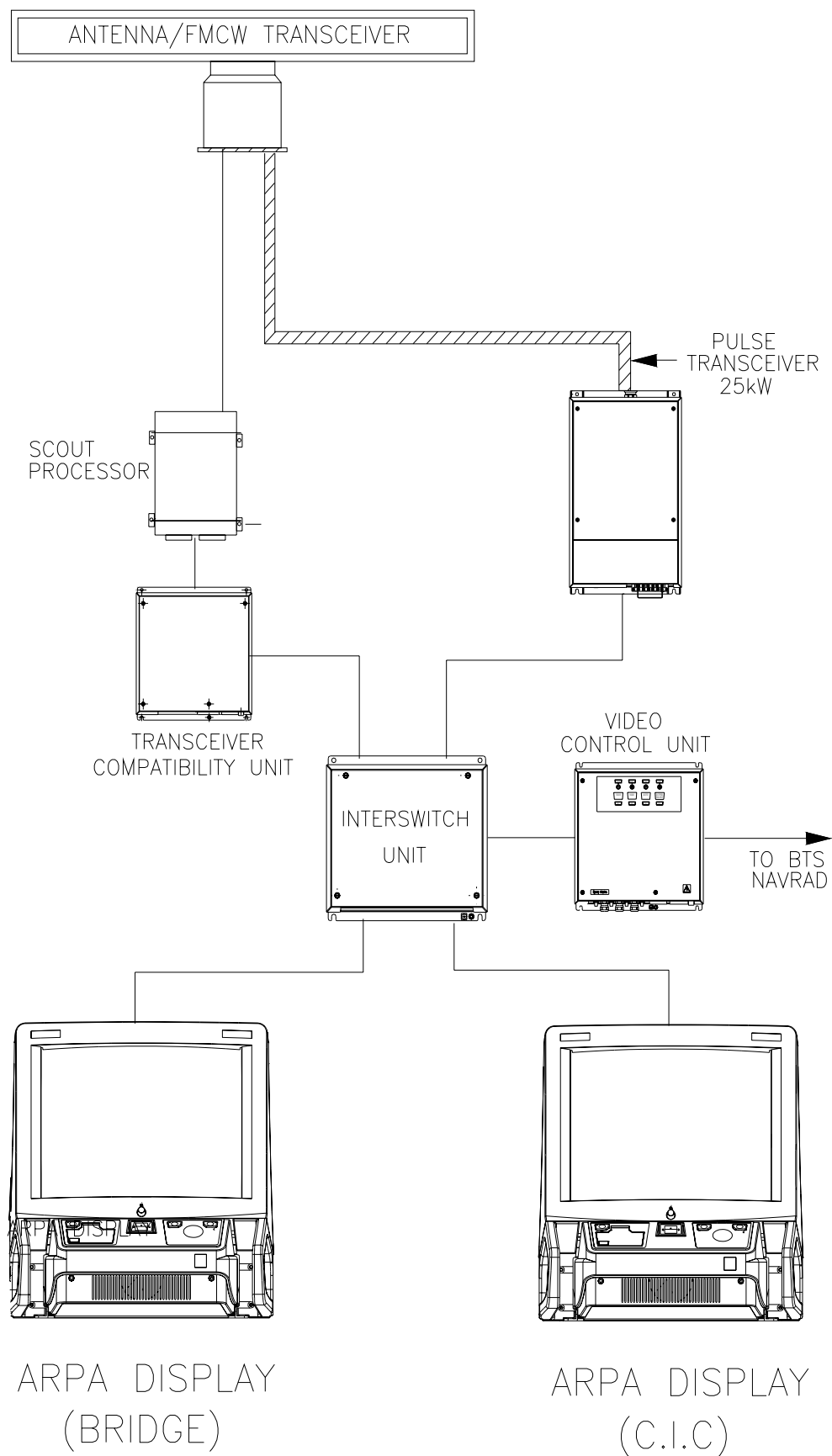- selection of SCOUT LPI Radar On/Off

ANTENNA/FMCW TRANSCEIVER

PULSE
TRANSCEIVER
25kW

SCOUT
PROCESSOR

TRANSCEIVER
COMPATIBILITY UNIT

VIDEO
CONTROL UNIT

INTERSWITCH
UNIT

TO BTS
NAVRAD

ARPA DISPLAY
(BRIDGE)

ARPA DISPLAY
(C.I.C)

Figure 1.1 Combattante III Navigation Radar System

Control Panels

The Display Unit is always fitted with a Simple Control Panel which is mounted immediately below the screen. This panel contains a simple pointing device (a tracker-ball referred to as the cursor control) with two associated keys (left and right) which are used to control the radar and its display. The panel also contains a two memory-card reader. Memory cards are used for storing and retrieving information such as maps and recorded tracks.
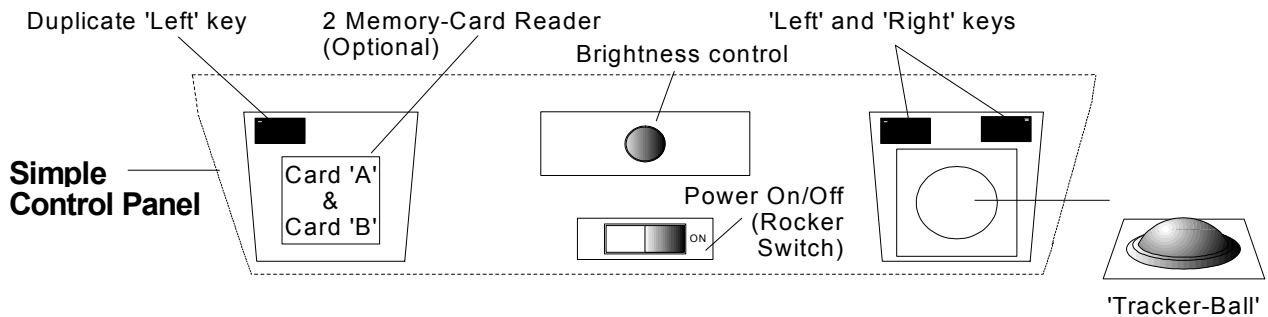
System Features

The BridgeMaster E displays for Combattante III offer the standard BridgeMaster E ARPA facilities with additional Naval features, and when SCOUT mode is selected a man machine interface for controlling the SCOUT radar.

Common Features

The following table lists the standard ARPA display features:

Feature	Additional details
Transceiver control	Selection and set up. Manual/automatic tuning. (Nav Transceiver only)
Video processing controls	Video gain. Manual/automatic anti-clutter sea/rain control. Enhanced video mode.
Display controls	Picture brilliance (day/night selection). Manual/automatic degaussing facility. Displaying/hiding heading line and synthetics. Off-centring the radar picture.
Defining and displaying user specified data	Own ship's position. Waypoint data. Wind and depth data.
Range scale selection	Range in nm. Range rings on or off.
Ship's heading and speed display	Compass alignment. Selection of speed mode. Applying drift.
Selection of presentation mode	Head-up (unstabilised). North-up or Course-up (stabilised).
Selection of motion mode	Relative motion (relative trails) – RM(R). Relative motion (true trails) – RM(T). True Motion – TM.
Selection of vector mode	Selection of true (T) or relative (R) vectors. Selection of vector time.
Selection of trails mode	Short trails. Long trails. Permanent trails. Off.
Defining and displaying EBLs, VRMS & ERBLs	2 Electronic bearing lines – EBL 1 & EBL 2. 2 Variable range markers – VRM 1 & VRM 2. Each EBL/VRM pair can be displayed as a combined ERBL – ERBL 1 and/or ERBL 2.

Navigation facilities	Position as derived from:
	    Navigational sensor
	    An estimated position
	Display of externally input route.
	Display of steering data for input route.
	Displaying, recording and replaying tracks.
	Defining the system time and date stamp.

Feature	Additional details
Defining and displaying maps	Selecting map for display. Displaying lines and symbols. Creating/editing maps and folios.
Displaying parallel index lines	Defining line type. Displaying at least four index lines.
System tools	Display of rotating half or full cursor. Defining and displaying marks. Constant radius turn. Selection of rates-of-turn. Display of ship's profile.
Extensive alarm indications	The current unacknowledged alarm with highest priority is displayed. Facility for acknowledging alarms. Display list of acknowledged alarms. Alarm buzzer facility. Watch alarm facility.
2 Memory card facility	For storage and retrieval of data.
Interswitch control capability	Selection of Master/Slave operation, and between SCOUT and Nav Radar transceivers.
Extensive monitoring and test facilities	Built in self tests (BIST).
Help line warning prompts	Permanent and temporary prompts.

Feature	Additional details
Defining closest approach and bow crossing	
Manual/automatic acquisition of targets	
Defining annular auto acquisition zones	
Defining polygonal auto acquisition zones	
Multiple target displays	
Carry out trial manoeuvres	
Naming of targets	
Displaying target IDs	
Displaying past position dots	
Track repair facility	
Test targets facility	
Output of NMEA target data	
Guard lines	
Remote alarm – with Interface Unit	
Track History	
Internal Routes	

Special Naval Features
The following table lists those features which apply to the naval display.

Feature	Additional details
Red first strike	
Freeze frame	
Target intercept	
Advanced index lines	
Helicopter approach sectors	
Station keeping	
Sector transmission	