

# NTD

## Navigation and Tactical Display

The exceptional ability of the Navigation and Tactical Display (NTD) to provide the user with the tactical picture, brings a Recognised Maritime Picture from the Operations Room (CIC) to the bridge team and other users. Multiple radar sources, data link systems, sonar, navigation, electronic warfare and optronic sensors, are all fused into a clear

and concise format instantly recognisable in the modern warfare environment. By combining both traditional and new technology sensors with all formats of electronic chart, mapping and reconnaissance data, the tactical and navigational awareness of the user is raised to a new level.



# NTD Navigation and Tactical Display

Allowing the user to create, copy or export true and relative tactical, operational or local overlays, the NTD increases overall tactical awareness. Torpedo search areas, weapon systems safety and ricochet danger zones, may also be displayed. This clearly presented information increases safety and allows for faster and more accurate decisions.

Able to track both rotary and fixed wing aircraft, the NTD can provide secondary radar information such as RRB, Vesta or IFF. In addition the NTD also displays visual glide path representation to assist in the launch and recovery of aircraft. Combining this capability with sonar search patterns and remote control of drones and underwater vehicles, the NTD is able to command and control all three dimensions of the battle-space.

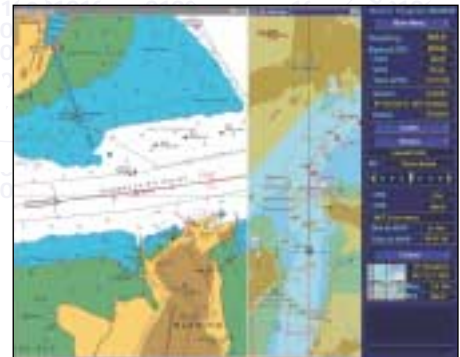
The NTD can be used equally as a stand-alone display or part of a wider network. Using modern manufacturing techniques the NTD combines truly rugged construction with state of the art PC technology. This allows displays to share information and to be networked using an Ethernet LAN or wireless network. Client Server techniques enable an unlimited number of displays to share information.

## NTD-Advantages

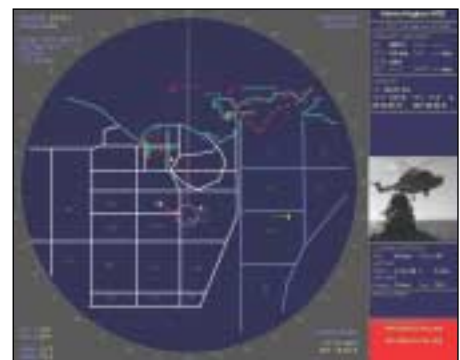
- Tactical picture compilation and multi-sensor fusion
- Real time reliable data in a clear and concise format
- Designed for use within a combat environment
- Designed, built and tested to demanding environmental standards
- Small, space saving lightweight units
- A range of display screen options
- Multi-function capability reduces the cost of multiple displays and reduces manpower levels
- Modular design allows bespoke system flexibility with reduced logistics support costs
- Hardware and software architecture enhances through life support and provides reduced cost for future upgrade
- Bi-directional networking allows NTD to be used as primary, back-up or complementary command and control workstation



The NTD provides a wide range of radar and tactical display features



Kelvin Hughes ECDIS is compatible with multiple raster and vector electronic chart formats



Picture-in-picture CCTV video displayed on tactical radar display



Multifunction NTD can display a wide range of image sources



## WECDIS Capability

The NTD product range has been extended to include the world's most advanced Warship Electronic Display and Information System (WECDIS). The NTD - WECDIS offers the functionality required by military vessels and command centres. Key features include:

- Type Approved International Maritime Organisation (IMO) ECDIS
- The use of additional Military Layers (AML) data
- Mission planning and water-space management
- Seamless fusion of all electronic chart with mapping data
- Employment of military navigation techniques such as: all forms of visual fixing, dived submarine navigation, integration with military inertial navigation and position resolution systems
- Pre-defined search and rescue (SAR) patterns



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Corvettes and Patrol Boats  
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## Roles

### Littoral Combat Ships, Corvettes and Fast Patrol Boats.

Options for tactical picture weapons control work stations can be employed to configure very cost effective command systems. For high speed vessels, the NTD is able to provide target acquisition and indication for weapon control systems when used with high-speed radar options.

### Frigates, Destroyers and Aircraft Carriers

The NTD provides complementary radar only, WECDIS only or multi-use workstations to support and exchange data with the ship's command system. The inherent flexibility and modular nature of the NTD is used to greatest effect when combinations of displays, processors and software options are used to form Naval Integrated Bridge Systems (IBS). The NTD IBS is then able to act as a tactical back up to the Command System as well as controlling position data for the vessel's weapons systems.

### Submarines

The NTD allows the fusion of data from all sensors (Sonar, Command System, ESM, Radar, and periscope Infrared and Visual Video data) with submarine navigation software. Using de-mountable, ruggedised and waterproof systems the NTD range of displays are capable of being used on an open bridge. The modular nature of the NTD then allows these units to be used in the control room, with other NTD workstations once submerged.

### Mine Counter Measure Vessels

Multiple NTDs in a networked command and control system for the bridge and operations centre provide highly accurate navigation and position keeping combined with tactical picture compilation. The NTD is able to control and deploy remote and umbilical controlled vehicles. The picture in picture capability increases safety of sweep or boat deck personnel when combined with onboard video or imaging systems.

### Logistic Transport Ships and Landing Platform Docks

Networked command and control functions allow planning, and execution of military operations without the need for separate systems. The NTD meets international standards for ARPA and ECDIS; it is then able to combine these features with the additional tactical features. When the NTD is then combined with optional WECDIS software the battle-space can be extended for amphibious and land operations, by using digital imagery and land map overlays.

### Special Forces and Landing Craft

NTD is capable of remote control, guidance and tactical data provision for amphibious operations and can be enhanced through the use of wireless networks and down loading plans from other systems. Employing these techniques allows boats and insertion vehicles to deploy personnel, move out to a holding area or recover personnel whilst unmanned.

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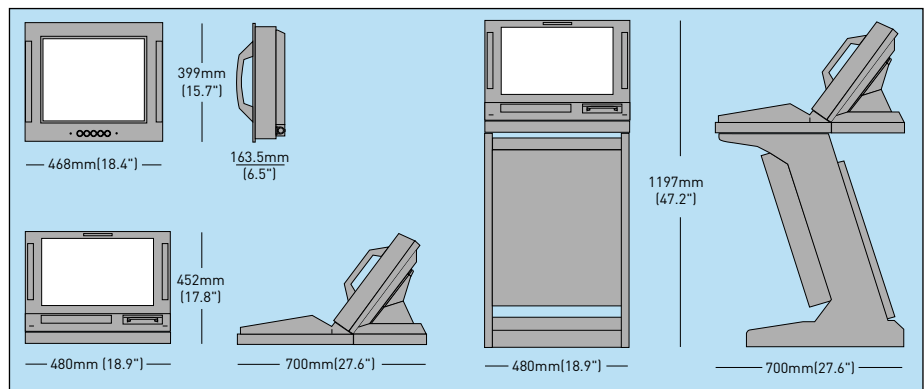
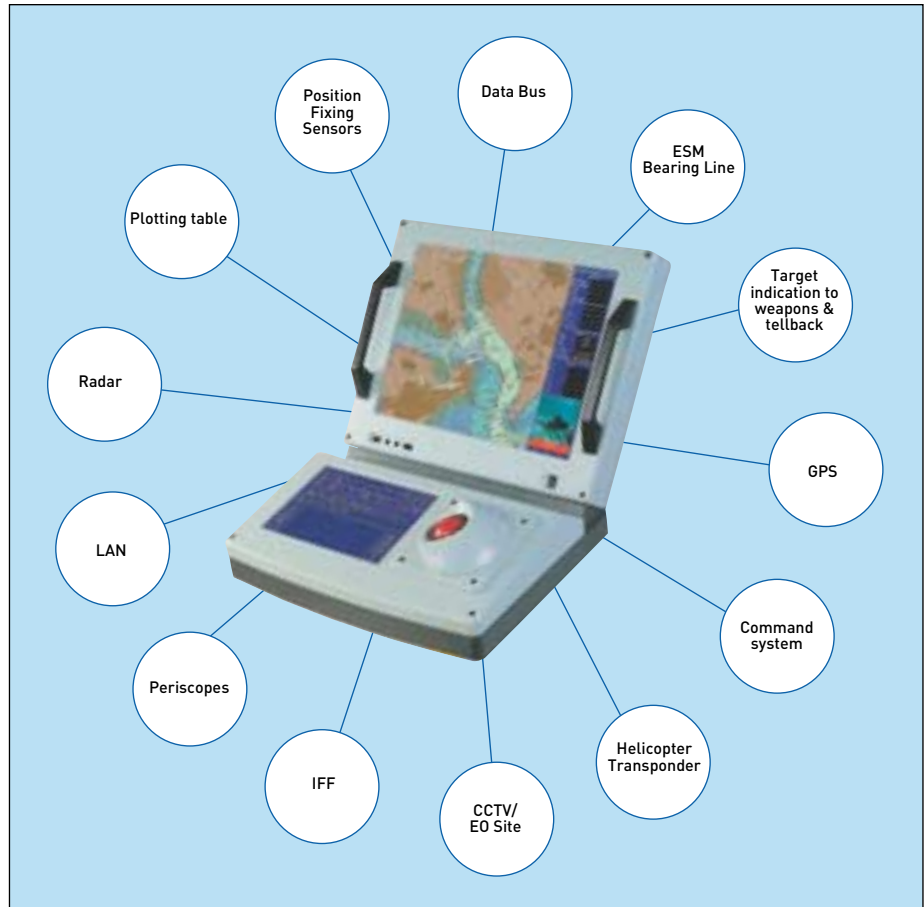
## Capability

With over 250 years of experience and innovation, Kelvin Hughes' engineers continue to lead the world in military display, radar and navigation technology. Over 30 navies world-wide are currently operating with Kelvin Hughes navigation systems.

By continuing to invest in research and development Kelvin Hughes are proud to be world leaders within their field of expertise. Current research projects include radar antenna technology development and signal processing techniques to enhance radar tracking, amongst others.

The result of this history and success is demonstrated well within the NTD. Kelvin Hughes have used the experience gained in both the retro fit and new build markets. This level of configuration flexibility is unsurpassed by other manufacturers, whilst remaining a highly cost effective.

Kelvin Hughes supports its customers and navies in many different ways. Kelvin Hughes are the largest supplier of paper and digital chart data in the world and can offer a postal or satellite broadcast for corrections to paper, electronic charts and publications. All technical manuals and handbooks are available in paper and electronic form and follow the NATO standard format. The dedicated Product Support Team, based across the globe offer, 24 hour telephone and fax support, extended warranties, service support contracts, recommended lists of spares, full ILS studies and a world-wide network of service agents.



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