

Arrowhead™ 140



A proven, capable and adaptable
frigate for modern, global navies.

www.arrowhead140.com



Babcock is committed to delivering Arrowhead 140; a proven, capable and adaptable frigate for global navies.

Utilising cost and schedule benefits, and capitalising upon a mature and proven design, Arrowhead 140 will deliver an assured frigate capability which is best placed to serve the adaptable demands of nations globally.

Proven

Developed from the proven OMT Iver Huitfeldt frigate, Arrowhead 140 builds on previous real-world NATO, Coalition and US Task Force group operational experience, providing an efficient design with an optimal layout.

The platform's clever design enables improved capability whilst retaining its proven strengths.

Capable

Arrowhead 140 is capable of fulfilling and supporting maritime security requirements world-wide.

The design can accommodate a range of mission system configurations to meet your operational and capability needs.

Based on an open architecture, the mission system manages a suite of sensors and associated communications to provide essential situational awareness, the ability to operate organic or offboard assets and conduct offensive and defensive operations, including both surface and antisubmarine warfare.

Designed to provide maximum capability and value for money, Arrowhead 140 uses modular construction combined with proven and commercially available systems and equipment. If required, its configuration is suited to a multi-site, distributed build strategy, with final assembly centred on one site but with the potential advantage of spreading the economic benefits and supply chain opportunities throughout shipyards.

Furthermore, Arrowhead 140 employs Babcock's iFrigate™ technology to reduce through-life support costs and maximise platform availability and readiness.

Adaptable

Arrowhead 140's architecture can be configured to meet specific requirements. This general purpose frigate has in-built design margins to accommodate a variety of equipment choices for a broad range of roles, from low-threat security operations to task force deployments, ensuring it will remain a credible and capable option within an international maritime force and evolving multi-threat environment.

Adaptability is a core element of the Arrowhead 140 design philosophy.

Large re-configurable mission and payload areas onboard can provide flexibility across a range of operational roles, from HADRO (Humanitarian Aid and Disaster Relief Operations) to unmanned systems deployment and operation; detecting enemy submarines and defending convoy ships.





Babcock offers a holistic breadth and depth of expertise to deliver a proven, capable and adaptable design for modern, global navies with comprehensive in-service support options.

The Arrowhead 140 team comprises:

- › **Babcock** – ship design and complex project management with a wealth of naval engineering experience
- › **Thales** – Combat Systems Integrator; combat management system and equipment design, build and integration
- › **OMT** – platform design for our proven, in-service baseline design
- › **BMT** – ship design and technical support

The Arrowhead 140 team is a fully integrated project team head-quartered in Bristol, at the heart of a robust ship design, build and support capability.

Babcock brings together a unique combination of:

- › naval and commercial vessel design, with extensive experience of compliance with both naval and commercial design standards
- › naval and commercial vessel build with modern, robust delivery practices
- › trusted combat systems design, build and integration experience
- › extensive naval engineering capability and highly skilled workforce
- › proven and efficient naval customer requirements and acceptance management processes
- › comprehensive safety and environmental management processes and compliance
- › world leading experience in naval platform in-service support with a deep understanding of support cost drivers

Tried and tested build strategy

Arrowhead 140 is designed for modular build, an approach which Babcock has proved effective through the construction of the UK Royal Navy's Aircraft Carriers.

This technique allows for improved speed and efficiency in manufacture and assembly, programme de-risking and delivers wider national prosperity.

Providing technical support throughout the build stage has meant that lessons learnt during construction have been fed back to improve Babcock's design skills for future platforms.

Our experience in platform refit and maintenance means that we have extensive knowledge of the practicality and usability of platforms, understanding the effects of design in action.

Established supply chain

As an established naval engineering design, build, train and support company, Babcock benefits from existing relationships with a broad range of military supply chains which can be utilised through all aspects of the build programme and future in-service support requirements for the new ships.

With operations around the world, Babcock has strong relationships with international suppliers providing fast, efficient delivery of materials and supplies to platforms deployed globally.



The Arrowhead 140 team has exceptional reach into global markets with established international bases, relationships and contracts.

Effective whatever the task

Arrowhead 140 can operate independently or integrated with a Task Force to conduct offensive and defensive Surface, Anti-Submarine and Air Warfare.

The baseline Arrowhead 140 design can be configured to meet the broad range of operational requirements and profiles a global frigate will be called upon to undertake.

Operational roles will change through the life of the ship, from mission to mission. Arrowhead 140 provides sufficient flexibility and adaptability for a multi-role capability to meet changing operational needs, ranging from anti-submarine warfare, surface warfare, electromagnetic manoeuvre warfare and air warfare.

Arrowhead 140 is able to:

- › destroy surface ships over the horizon
- › detect and destroy enemy submarines
- › defend convoy ships
- › employ active and passive electronic warfare systems
- › defend against swarming small boat attacks



Design baseline content which can be adapted to accommodate your specific requirements

Medium Calibre Guns

- › Design provision for MCG up to 5" (127mm) with associated infrastructure.

Missile Options

- › Deck space for up to 8 SSGWs.
- › Flexible space for VLS- up to 32 variable length cells.

Aviation

- › Flight Deck sized for AW-101 Merlin/MH-60 Seahawk.
- › Hangar capable of accommodating an organic naval helicopter including a AW-101 Merlin, or a lighter helicopter such as the AW-159 Wildcat plus unmanned air vehicles.
- › Design can accommodate a wide range of future customer naval air systems.

Aircraft	Flight Deck	Hangar
AW101 Merlin	Yes	Yes
NH90	Yes	Yes
MH-60 Seahawk	Yes	Yes
AW159 Wildcat	Yes	Together
UAV	Yes	

Small Calibre Guns

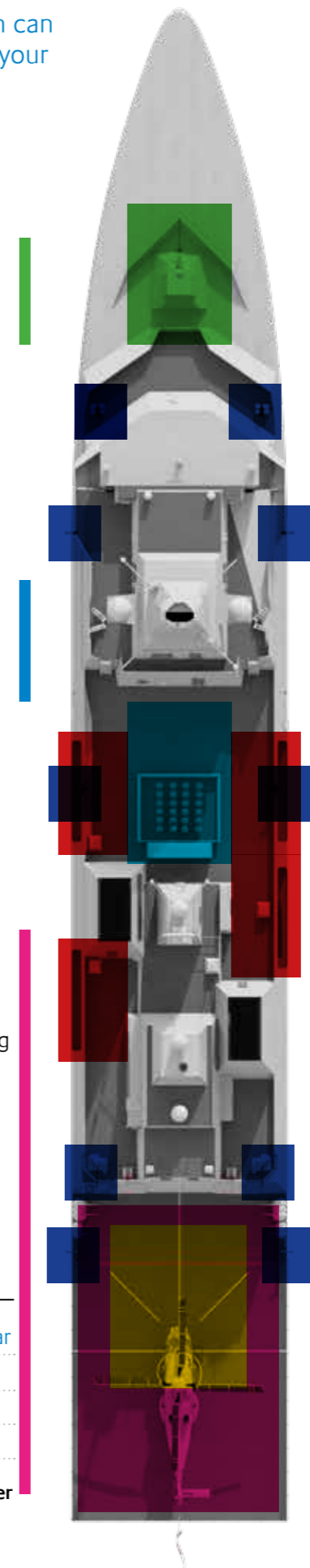
- › Design provision made for Force Protection weapons and SCGs up to 40mm with associated EO sensors and magazine arrangements.
- › Weapons can be fitted at a number of upper deck positions.

Boat Bays

- › 4 large dedicated Boat Bays with flexible launch & recovery arrangement to cater for varying operational roles, incl. deployment of RHIBs, USVs & UUVs.

Mission Space

- › Significant operational flexibility allows for numerous TEU (Twenty Foot Equivalent Unit) containers, extended stores, or personnel accommodation space.



Adaptable and established systems

Incorporating Thales' TACTICOS system with fully open architecture sets the combat systems solution apart. Currently in service for 25 years and exported to 24 navies globally, this established system and equipment in-service support package is flexible to customers' needs over the lifetime of the platform and will maximise the combat system capability for customers. Innovative design and equipment also reduce through-life costs and will negate the need for upgrade through replacement.

Certified openness and scalability of the underlying architecture is at the core of TACTICOS. A new software release every six months provides continuous evolution and functionality growth. This reduces through-life costs and keeps the system operationally relevant even if requirements change. Thanks to its modularity, the Combat Management System can easily be expanded to include additional mission profiles such as Anti Air Warfare (AAW) or Anti-Submarine Warfare (ASW). This is achieved through installing the necessary subsystems and software modules.

Flexible delivery of maritime security

Arrowhead 140 is designed to accommodate your detailed requirements and has a highly adaptable baseline of capability and systems.

Multi-role capability

Proven multi-mission reconfigurable space able to host a number of TEU containers for capability including antipiracy detention facilities, disaster relief stores or additional accommodation.

Spaces can be rapidly and simply used for HADRO through to war fighting operations, with volume spaces able to accommodate role-specific equipment in a modular form.

The ability to fit the existing systems and equipment from the parent design is retained to provide flexibility in the capability supplied at build and through the life of the platform. For example, this retained capability means that the 32 cell Mk41

Strike Length silo can be fitted to incorporate a combination of a larger number of anti-air missiles, vertical launch anti-surface missiles, precision land strike missiles or ASW weapons such as ASROC. This particular adaptability feature, alongside the ability to install a 127mm (5") medium calibre gun, host an organic medium naval helicopter or lighter helicopter such as AW-101 Merlin, install sensors such as a towed array/variable depth sonar and re-introduce a magazine-launched torpedo system, amongst other proven features, will allow the platform to be tailored on build and through-life to suit operational requirements from low-threat maritime security to warfighting in task group operations.

Accommodation

The platform will operate in all states and conditions with a Ship's Company of less than 100 personnel. With dedicated accommodation for 160+ personnel and additional temporary accommodation, the platform can carry a significant number of Embarked Military Force, including Special Forces, littoral manoeuvre troops or additional command and control personnel.

Armament

Medium Calibre Gun options up to 5" (127mm) for maritime interdiction, self-protection and engagement of surface and land targets.

Small Calibre Guns up to 40mm calibre can be located in pre-designated upper-deck weapon positions.

Capability options:

- › Provision for up to 8 canister-launched SSGW
- › VL missiles (SAM/SSGW/Land Strike/ASW) up to 32 cells
- › Close-In Weapons Systems

Intelligent layout

The layout of the design benefits from the experience of several years of real-world NATO and coalition operations, including integration within US Navy Carrier Strike Groups as an escort platform. These lessons learnt from the baseline design lead to key operational and mission areas within the Arrowhead 140 design that are situated to provide an optimal layout for operations in both peacetime and high threat operations.

The key mission areas benefit from proximity to each other and protection through the relative location within the ship. Supportability of major equipment identified through shipping routes and space envelopes.

Mission systems

Thales TACTICOS™ Combat Management System utilises open architecture networks and computing environments to provide a scalable and upgradeable mission/ combat management capability suitable for a wide range of mission profiles and scenarios.

Arrowhead 140 mission system also includes:

- › An integrated communications suite for interoperability with own and coalition forces and civilian agencies
- › Medium and short range radars for situational awareness, safe navigation, fire control and helicopter control
- › Radar ESM and Defensive Aids Suite to provide self-protection
- › EW capability upgrades
- › Electro Optical trackers for surveillance and gun fire control
- › Hull-mounted sonar for submarine detection/ mine avoidance with capability options for towed array and torpedo defence

Mission flexibility

Significant operational flexibility is inherent in a platform with the capacity of Arrowhead 140. Based on a proven NATO frigate design, with flexible spaces able to host disaster relief stores or civilians during evacuation operations amongst other roles; a demonstrated capability already employed within the in-service design.

Four large dedicated Boat Bays with flexible launch and recovery capability to operate a variety of different offboard assets, such as RHIBs, Unmanned Underwater Vehicles (UUVs) and Unmanned Surface Vehicles (USVs); able to deliver a range of roles from interdiction missions to Special Forces operations and littoral manoeuvre exploitation.

Arrowhead 140 delivers a proven flexibility and rapid ability to rerole/reconfigure to a changing operational environment.

Aviation facilities

The flight deck is designed for a wide range of naval aircraft and air systems, with a hangar that can accommodate an organic medium naval helicopter or lighter helicopter combined with unmanned air systems. Dedicated aviation magazine facilities to store and prepare air-launched weapons including ASW torpedoes and Anti-Surface missiles are provided. In addition, a fuelling system to provide HIFR capability from a proven NATO flight deck is incorporated.

The large flight deck provides the flexibility to launch and recover non-organic aircraft up to 15t in weight.

Efficient propulsion plant

The propulsion arrangement is a proven and efficient CODAD architecture, already in service. This is demonstrated to provide a flexible speed range with 28+ knot maximum and 18 knot efficient cruising speeds, in a package with a low maintenance burden and consideration towards underwater radiated noise (URN) signature. The size of the platform allows sufficient fuel for long-range independent global operations.

Space and systems configured for compliance with IMO Tier III regulations for ECAs.

- Maritime surveillance and interdiction
- Counter piracy
- Military presence and deterrence
- Humanitarian aid and disaster relief
- Task Group support
- Consort protection
- Anti Submarine Warfare

Integrated, intelligent in-service support

Arrowhead 140 is designed with reliability and high availability in mind, ensuring efficient in-service support and adaptability options. Customers benefit from our unparalleled Through-Life Support (TLS) expertise and embedded iFrigate™ technology which supports delivery of in-service support efficiencies.

Babcock is a trusted support partner to global navies and has access to a network of established, at reach facilities.

Innovation

Babcock is harnessing the power of innovative technology to advance through-life support opportunities and platform availability and readiness.

The use of iFrigate™ architecture optimises engineering support. The introduction of a suite of technology, equipment and system sensors into the build means that a wide range of operational data can be fused, modelled, transformed and visualised, improving proactive maintenance decision support and optimising planning.

An on-board analytics suite allows informed risk based maintenance decisions to be made and aids defect diagnosis, whilst shore-side data analysis helps forward deployed support, optimising the next maintenance period and de-risking Class support.

Existing data from the proven in-service platform will also be used to optimise support.

Global reach

Babcock has a presence in nations aligned with UK and NATO allegiances and strategies meaning we can react swiftly to meet operational demands and deliver timely and flexible support world-wide.

Keeping warships safe, capable and available requires a collaborative, joint approach between the operator and the support partner. From the day your ship enters service, we can work with you to provide continuous and consistent support around the world.

We understand platforms, systems, and how they operate and can take an holistic view of your through-life support requirements; helping you to reduce costs and increase platform availability.

Training

As the leading supplier of personnel training to the UK's Ministry of Defence, Babcock has more than 20 years' experience of delivering these services to the Royal Navy, Royal Air Force, British Army and many international military organisations.



Delivering TLS from our DUQM support base in Oman

iFrigate™ Babcock's in-built 'smart' technology monitors platform performance in real time, optimising support requirements and delivering improved platform availability.





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