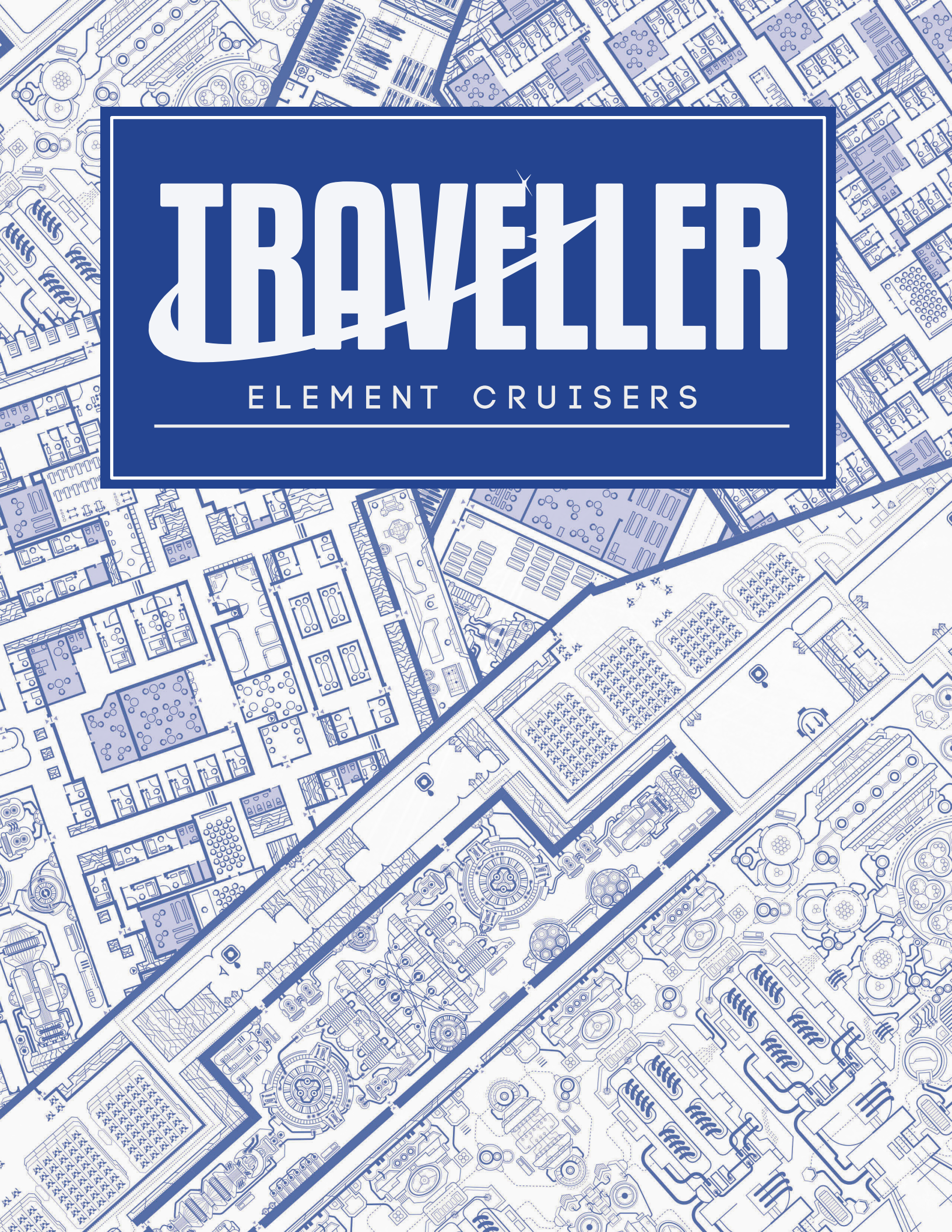
TRAVELLER
ELEMENT CRUISERS

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INTRODUCTION

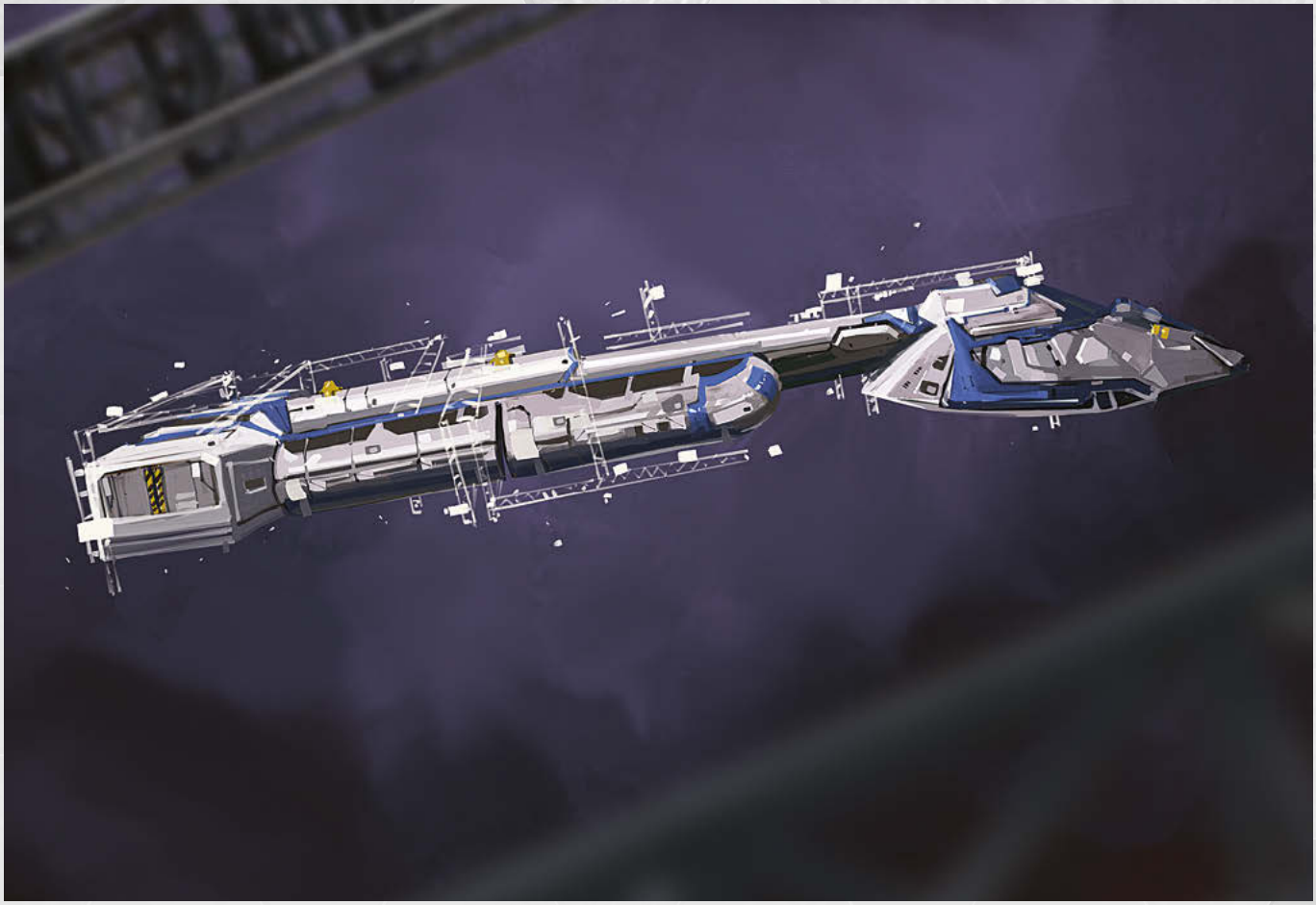
The cruisers of the Imperial Navy are both its symbol and its workhorses. Big capital ships are more impressive, however they are usually concentrated at bases awaiting the call to arms, whilst cruisers show the flag and deal with any trouble that arises.

The navy maintains a roughly 1:1 ratio of cruisers to capital ships. This tends to attract criticism in peacetime, when more cruisers would result in improved peacekeeping and a more visible navy presence on the spacelanes. When a major war breaks out, the situation is reversed – the only counter to capital ships of a foreign power is the battle line of the Imperial Navy. Cruisers support this force but cannot take on battleships and survive.

The necessity of being able to defeat an invading fleet means the bulk of the navy's budget is spent on heavy combat vessels – battleships, battle riders and fleet carriers – with cruiser, destroyer and patrol forces fighting for the remainder of the funds. To justify their existence, cruisers must either be versatile or extremely specialised. The cruiser budget is always squeezed and there are those who believe that they are a needless luxury. Destroyers and escorts can protect spacelanes from pirate vessels or escort major combatants. Battleships can blast the enemy battle line into fragments. Cruisers are too expensive for one of these roles and not powerful enough for the other.

What, then, can the cruiser force do to justify its existence?

The answer, of course, is: 'everything else'.



C H A P T E R - O N E

CRUISERS OF THE IMPERIAL NAVY

The term 'cruiser' has its origins on Old Terra, indicating a mid-sized vessel capable of undertaking long independent cruises. Such vessels had to be powerful enough to defeat any threat they might encounter on a distant station, without taking crippling damage, but could not cost so much that the battle line was deprived of a capital vessel. The list of tasks undertaken by cruisers has expanded greatly over the millennia, yet the definition still remains, more or less, true.

CRUISER MISSIONS

In wartime, cruisers take part in major combat operations, although usually in a supporting role. One or more cruiser squadrons will be assigned to a battle fleet, acting as flank guard or advance guard. The firepower of a cruiser allows a squadron to repel a strike by destroyers or smaller combatants, providing security for a fleet whose capital assets need to remain concentrated. Cruisers can also be detached to attack secondary objectives or conduct reconnaissance in force.

In battle formation, cruisers are tasked with protecting heavy assets from distractions or potentially serious threats from lighter craft. Some navies use over-gunned vessels, in light cruiser or destroyer classes, as strike assets capable of crippling or even killing a battleship with massed torpedo or heavy beam attacks. Even if they do not inflict serious damage, a battleship under close-range attack will not be operating effectively as part of its squadron, reducing the fighting capability of the force as whole. Battles have been lost as a result of such disruption.

Cruisers have the firepower to destroy lighter craft efficiently if they try to bypass the flank guards; if they instead attack the cruisers, the battle line is still protected. A few cruisers out of action will not stop a fleet completing its objectives; the loss of even a single battleship might. The role is an important one, although often it consists of long-range sniping at an enemy with missiles whilst waiting for a threat to appear.

Of course, cruisers can add firepower to any formation. Many cruiser classes have very significant missile armament and can augment a strike – some actually carry more missiles than a battleship. When forced to engage in direct combat, cruisers do not fare well against capital ships but sometimes there may be no alternative but to fill out a deficient battle formation with cruisers. This divides the enemy's firepower and, occasionally, a well-handled cruiser force manages to inflict serious damage on capital vessels.

The other battle fleet role for cruisers is as heavy escorts for carriers, tankers or battle tenders. These vessels are normally kept back, away from major threats, but may be attacked by fast strike ships. A single heavy or light cruiser may be sufficient to deter such an attack or break it up with heavy firepower. Where a supporting formation is attacked by overwhelming force, it is the duty of the escorting cruiser(s) to delay the enemy whilst the near-defenceless support vessels flee or jump out.

Likewise, it is common to use cruisers to protect battle tenders during the critical launch and recovery phases. With powerful battle riders out of the fight, the tender is very vulnerable and light escorts may not be enough to protect it from heavy attack. Many cruisers have met a gallant end keeping heavy enemy units away from retreating battle tenders, however since the battle-tender model is currently out of favour, the need for cruiser escorts has diminished.

Cruisers thus have a variety of roles to play in battle forces, however it is when operating detached or as part of a task force that they really come into their own. They can be encountered on a variety of missions and their crews might have to deal with a range of challenges in the course of a deployment. Most are routine, such as stop-and-search operations when a suspect vessel is encountered and enforcement of Imperial laws and regulations, yet sometimes a cruiser will be the only representation of Imperial authority when a revolt or plague breaks out in a backwater system. Its officers

and crew will have to deal with the situation on their own initiative until assistance arrives, which can be weeks or even months. Commanding a cruiser is a more varied occupation than being a battleship captain and many famous admirals made their name in cruisers before moving to fleet-level command.

Flag Showing is an important part of the navy's role. An impressive ship in orbit and smartly-uniformed personnel on the ground, reminds member worlds and potential enemies alike of the power of the Imperium. Light and heavy cruisers are the platforms of choice for this mission, although specialist vessels may sometimes be used instead. Occasionally a warship is ordered to proceed through a troubled or contested region to demonstrate freedom of navigation. This essentially comes down to giving the opposition a choice between firing on a navy ship or admitting that they do not control the disputed area.

Patrol and Guardship deployments are often combined with general showing-the-flag. Guardships are placed on a long-term basis and usually do not leave their station until relieved by another vessel. They are assigned to protect threatened or strategically important worlds, whether or not they have their own forces. Likewise, cruisers can undertake long patrols on or off the main trade lanes. If trouble arises, a cruiser is normally more than enough to deal with it. The loss of a major warship on patrol is usually an indication that a fleet-level response is needed.

Escort and Commerce Protection missions are similar to a patrol deployment, with a greater emphasis on protecting ships and installations. A heavy cruiser is overkill as escort for a small merchant vessel but sometimes a big warship will accompany a convoy or a large freighter for a couple of jumps. In wartime, commercial traffic is often gathered into convoys to protect against raiders, with captains willing to wait a week or two for an escort – or, in extreme cases, being forced to.

Commerce Raiding, or cruiser warfare, is the deliberate destruction of commercial traffic and the infrastructure that supports it. Cruisers are the preferred platforms for raiding operations and are also assigned to hunt down raiders. Whilst battleships could kill a raiding cruiser more effectively, dispersing the fleet to hunt raiders weakens the main striking arm, with potentially disastrous consequences. Even in peacetime, the immense cost of a capital ship deployment means that cruisers are preferred for this mission.

Interdiction operations are rarely carried out by vessels larger than a cruiser. Some Red Zones are not enforced other than by an occasional patrol; monitoring satellites and the threat of legal sanctions are considered sufficient in many cases. However, very troubled worlds or regions where there is a threat of attack on the interdiction flotilla are often assigned a cruiser as flagship for the force.

Intervention operations can be planned beforehand or may have to be undertaken in response to a rapidly developing situation encountered on patrol. Most are on a small scale and undertaken as an aid to civil power at the request of a world government. Ship's troops and vehicles may render assistance in a disaster or help prevent a coup. In the event that the world government is committing some serious transgression, such as harbouring pirates or engaging in biochemical warfare, intervention can be made at the discretion of the ship's captain. This is subject to a considerable body of law and no captain takes action against a member world's government lightly.

Strike missions are aimed at a specific target such as a major shipyard or starport, as distinct from general commerce raiding, in which targets of opportunity are taken at the captain's discretion. Strike missions are intended to cause direct damage to the enemy, by weakening the infrastructure supporting their fleet, and affect strategy by forcing a redeployment of naval assets to chase down or guard against raiders. A well-executed strike can affect the course of a war and making or preventing one is a major role for cruisers. Sometimes a strike is made against a low-value target for political reasons; in this case, the intent is to send a message without causing massive casualties in the hope of starting or influencing negotiations.

Bombardment missions are a subset of strike operations, targeted against planetside installations. Despite the name, which implies a fairly indiscriminate attack, most bombardments are very precisely targeted. Wherever possible, population centres are spared and weapons – usually but not always guided missiles or torpedoes – are targeted against troop concentrations, military bases and aerospace defence installations. Civilian infrastructure is avoided, not just for humanitarian reasons. Destruction of industrial centres and civilian infrastructure requires an expensive rebuilding process, acceptable in war against an external enemy, yet an internal conflict that results in economic self-harm is not in the interests of the Imperium.

Reconnaissance/Scouting missions are often the province of small and unobtrusive vessels, yet for fleet scouting a more robust method is often appropriate. Cruisers can undertake reconnaissance of the local area, for example approaching an installation ahead of heavy assets or can scout neighbouring systems and deal with enemy reconnaissance assets or minor threats.

Reconnaissance in force is often the only way to obtain reliable information on an enemy's rear area. In this case, cruiser forces penetrate deeply into enemy territory to scout and attack targets of opportunity. Depending on this mission, assets may be forbidden to make discretionary attacks or have a free hand to cause as much mayhem as possible.

SQUADRONS, TASK FORCES AND FLEETS

In peacetime, the Imperial Navy assigns vessels to numbered subsector fleets (such as the 117th Fleet) and named sector fleets (such as the Spinward Marches Sector Fleet) but this is an administrative measure only. When a job needs doing – from fighting a major war to escorting the new sector duke to his investiture – a suitable force is assembled and an officer of appropriate rank is assigned to lead it.

A single ship, such as a detached cruiser acting as guardship over a world, or undertaking a flag-showing cruiser, will be under the control of its commanding officer. A single-ship force of this kind is sometimes referred to as a Task Unit. In the case where a Task Group is created, by assigning a small number of ships or a major warship like a cruiser supported by several lighter escorts and/or noncombatant support assets, the major ship's captain commands the force without any need for temporarily altered rank.

A Task Force consists of two or more major warships, usually of different types, with escorts or supporting craft. For example, a task force might be created by deploying a light cruiser, a carrier and a handful of destroyers. Where possible, such a force would be commanded by a commodore but if necessary the captain of the task force's centrepiece (probably the carrier in this case) would be placed in overall command.

The Imperial Navy formally defines a Squadron as four vessels of identical or near-identical design, although the term is extended to any group of 2-6 vessels of broadly similar type. Squadrons exist that contain a missile cruiser, a heavy cruiser and a light cruiser, however these are typically administrative or 'holding' formations or else scratch forces thrown together out of necessity.

A squadron is commanded by a commodore, typically an officer who already holds the relevant rank and assigned to the squadron on a long-term basis. Where no suitable officer is available, the senior captain or the commanding officer of the most powerful ship is given the brevet (temporary, or acting) rank of commodore for the duration of his assignment. He may or may not retain command of his own ship – usually he does, however since he will be consumed with the affairs of the squadron as a whole he will rely heavily upon subordinates to run his ship and fight in combat.

Larger formations, such as fleets comprising multiple squadrons, will be commanded by an admiral, with a specific rank dictated by the size of the fleet. Admirals very rarely use a cruiser as their flagship unless there are no capital ships in the fleet, so the most senior officer who can be expected to be aboard a cruiser is a commodore. Occasionally, a squadron commodore receives a brevet to admiral and command of a fleet but he will almost certainly transfer his flag to a more potent vessel.

Forces and Commanders

Force	Composition	Commanding Officer
Task Unit	Single ship	Ship's commanding officer
Task Group	2-6 vessels of varying type and size	Commander of most powerful ship or senior rank present
Task Force	Two or more primary vessels plus supports	Commodore or senior officer present with the acting rank of commodore
Squadron (formal)	Typically 4 ships of near-identical performance or design	Commodore or senior captain with the acting rank of commodore
Squadron (informal)	2-6 ships of same general type	Commodore or senior captain with the acting rank of commodore

C H A P T E R - T W O

TYPES AND CLASSES

Over the centuries, a range of cruiser types have emerged. These are broad categories only; specific classes can sometimes fill more than one niche. The two most common types are light and heavy cruisers. Many vessels have no specific definition beyond this and are general-purpose vessels. The light/heavy designation refers to capability rather than size; a light cruiser will have less powerful armament and lighter armour than a heavy vessel but this does not necessarily mean it will be physically smaller. A ship that is mostly fuel tank might be bigger than a heavy cruiser but capable only of undertaking the light cruiser role.

In general, Imperial light cruisers are constructed at under 50,000 tons displacement, resulting in a habit of referring to any 50,000-ton-plus cruiser as a heavy cruiser or just 'cruiser', although a truly huge light cruiser might be constructed for a specific purpose.

Most, but not all, cruisers carry a spinal weapon mount; some specialist types do not. Most carry subordinate craft but a few have a sufficiently large complement that they are considered hybrid cruiser-carriers. Although some carriers have the tonnage to be considered a cruiser – and a few carry a spinal mount – once the vessel's primary capability is carried craft rather than armament it is no longer designated a cruiser.

Light Cruisers are usually in the 10,000-50,000 ton range and armed with a spinal weapon capable of devastating destroyer size vessels or lightly protected ships such as carriers and tankers but are not heavily protected. Light cruisers undertake patrol work or act as escorts for important vessels. Some are detached as destroyer leaders, adding firepower to a destroyer force, whilst others can be found scattered across a sector on solo deployments or as guardships. In wartime, the light cruiser force acts as raiders, escorts and scouts.

Heavy Cruisers are typically in the 50,000-100,000 ton range and carry a spinal weapon capable of inflicting serious damage to a cruiser or even a capital vessel. By convention, a specialist cruiser not designated as light (for example, light strike cruiser) is usually a heavy cruiser, with armament and protection proportional to its role.

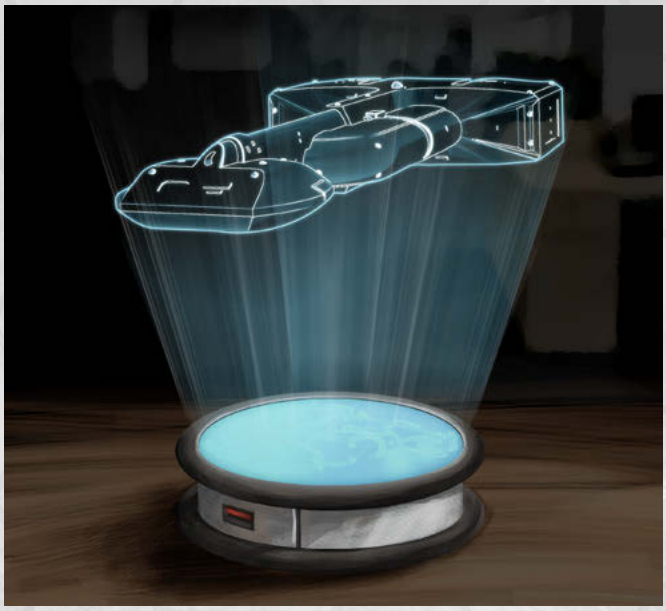
Armoured Cruisers are, as the name suggests, heavily armoured. This level of protection often comes at the expense of mobility or firepower; many armoured cruisers are capable of less than the standard jump-4 required for fleet-mobile assets. They are very tough ships, however, often deployed on their own or as the centrepiece of a task group guarding a strategic location or maintaining an interdiction. An armoured cruiser is unlikely to take damage that will drive it off station from anything less than a heavy cruiser.

Battlecruisers are uncommon in Imperial service, although experiments have been conducted. Battlecruisers mount the armament of a battleship on a lightly protected hull, coupling it with high mobility. As such, they can be considered an extreme form of the strike cruiser. Battlecruisers are best suited to fast raids or chasing down cruiser-sized raiders, operating on the principle that they can outrun whatever they cannot outfight. However, experience has shown that this is not always the case.

Bombardment Cruisers are specialised vessels not usually counted among the cruiser strength of a fleet since their role is planetary attack rather than space combat. They are armed well enough for self-protection against smaller vessels but the majority of their armament is optimised for attacks upon ground targets. Missiles and torpedoes are the usual weapons of choice but mass drivers are sometimes mounted instead. Bombardment ships are often fitted with heavy close-in defences, as they are targeted for return fire by missiles or fighter squadrons.

Escort Cruisers are optimised for the protection of other vessels against smaller craft. An escort cruiser under 10,000 displacement tons will usually be designated a fleet escort but larger vessels are counted among the fleet's cruiser strength. Many escort cruisers have no spinal mount or carry a lighter one (by cruiser standards) intended for destroyer-killing. Commonly, numerous bay weapons backed up by beam turrets for fighter defence are mounted. Escort cruisers are considered useful for anti-piracy work as their armament is tailored to the smaller ships pirates use. They cannot take on a cruiser of the same size with any real chance of victory.

Flag/Command Cruisers are uncommon and tend to be modifications of existing designs rather than a specific class of ship. Many cruisers carry a flag bridge for use by a task group or squadron commander but a flag cruiser has more extensive command, control and intelligence facilities. These usually include conference rooms,



accommodation for additional staff and workplaces for intelligence analysts, logistical planners and all the other staff required for command of an operation. Some senior members of the Imperial nobility have a flag cruiser as their personal vessel, rather than a yacht and escorts. These vessels are often demilitarised by having part of their armament removed but some retain almost their full warfighting capabilities.

Intervention Cruisers are unusual, being designed for internal security matters rather than fighting wars. An intervention cruiser is lightly armed for its size but carries a large troop contingent and the interface craft to get them planetside quickly. The concept behind these ships was sound enough; they would undertake long cruises through the backwaters, resolving problems as they are encountered, but the authorities considered funds would be better spent on more versatile ships.

Patrol Cruisers are optimised for long deployments, with extensive crew accommodation and facilities to reduce fatigue. Armament and protection tend to be lighter than usual for a ship of their size and often jump capability is lower as well since these ships are not expected to make rapid strategic redeployments. Patrol cruisers are well suited to commerce protection, flag-showing and guardship deployments, and often used as training ships.

Protected Cruisers are similar to armoured cruisers – indeed, the terms are often used interchangeably – but the defences of a protected cruiser are of a different sort. Armour is installed but a protected cruiser will carry an unusually heavy point-defence armament, more sandcasters and additional nuclear dampers or repulsors to enhance survivability at the expense of mobility or firepower.

Rift Cruisers are high-jump vessels for use in regions of low stellar density. The need to carry large quantities of jump fuel means that firepower and armour must be reduced and rift cruisers tend to be extremely expensive for the fighting power they provide. They are sometimes pressed into service as rapid-response vessels

Strike cruisers sacrifice weapons, thrust and armour for the greatest jump range, occasionally carrying drop or dis-mountable fuel tanks in order to extend their reach yet further. Such ships embody the philosophy of hit and run design, striking deep behind enemy lines to pick off key targets and vital assets, before jumping away.

VARIANTS AND EXPERIMENTS

Cruisers are built in significant numbers and serve for a sufficiently long time that variants of any given class inevitably emerge. Updating to meet new threats is usually done at scheduled refits, although sometimes a vessel will be altered when it comes in for repair after combat and occasionally a whole class is recalled for an urgent upgrade.

Over time, a given design will evolve and might diverge into several distinct variants. Threats in one region might require additional point defences; in another these might not be needed and increased troop accommodation is fitted instead. Some designs deliberately incorporate ‘upgrade space’, sacrificing a little capability on the day of launch in return for longer service life and the opportunity to add necessary equipment in a rational and crew-friendly manner. Ships without such upgrade capability end up with retrofitted equipment jammed into any available space, making maintenance and sometimes even routine operations a difficult business.

Cruisers are often used as testbeds for new technologies or techniques, usually old vessels that have been retired from combat service, but occasionally a new ship is built specifically as a development platform. One-off vessels are also sometimes constructed to try a new concept. These ships may be later converted to other roles but occasionally are pressed into service to meet an urgent need. It is thus possible to encounter the occasional experimental cruiser (quite possibly of extravagant or unworkable design) carrying out routine operations. These ships are nicknamed ‘funnies’ in spacer parlance. Their capabilities vary enormously but a cruiser is still a cruiser; no matter how inefficient or just plain weird the design may be, a 75,000 ton vessel is a very significant presence on the spacelanes.

PROCUREMENT AND DISPOSAL

Naval procurement is a lengthy and complex business. Admirals and ship crews might wish for ships bought with nothing but capability in mind, yet procurement is far more complex than this. It has been wisely said that many naval actions were won or lost in a procurement meeting five decades before and that the only certainty in strategic planning is that whatever you are best prepared for will not happen.

Procurement decisions are made by the Admiralty, subject to a great many competing requirements. Obviously, the type of ship the navy wants or needs must be considered and often the decision is made to create a class that can handle more than one role. This approach sacrifices high-end capability for cost-effectiveness, allowing the navy to buy more hulls for the same budget allocation. With a lot of star systems to cover, this is an essential consideration.

There are other pressures at play, as well. Megacorporations and major shipyards have a lot of influence and can persuade the procurement board to buy their design even though that of a competitor is, on balance, better. Employment is yet another issue; the navy has, at times, ended up with rather poor vessels because building them kept huge numbers of people in work. It is the naval crews that end up paying the price for this sort of economic decision but, in a system as complex as the Imperium, trade-offs are inevitable.

The procurement process can be very complex, with the cost of a ship class offset in various ways. For example, a shipyard might offer to build a particular class at a discount, providing the Imperium funds the construction of a prototype it hopes will later be adopted for service. Conversely, the navy might agree to award a build contract to a particular megacorporation in return for the construction of infrastructure on a key world. These offset deals can be so complex that nobody really knows the true cost of the project and this, in turn, can lead to some rather strange decisions.

Once a contract is awarded the ships go into production, usually at several yards in different regions. Lessons learned with the lead ships of the class are then incorporated into later examples, which in some cases can lead to an extensive mid-build redesign. One trick used by the procurement board is to initially build a ship with a reduced specification, then ask for money for upgrades in future budgets. When this works, it can produce very capable vessels that would not have been affordable in a single budget allocation, yet if the extra funding is not awarded the ship will have to manage without some of its intended systems. This is one reason why some classes never receive their full electronics fit, point defences or other necessary components.

Disposal is, in some ways, the opposite of procurement. Something has to be done with old warships and their fate can vary a lot. Some are mothballed in the reserve fleet, awaiting reactivation in the future. Usually this never happens and vessels deteriorate over time, although occasionally a class will be put back into service either ‘as is’ or after an upgrade and refit.

A few retired ships become museums or monuments but most go to the breakers’ yard for dismantling. A lot of the basic materials and some of the systems built into a ship can be re-used but breaking is not simply about recouping some of the costs of the ship. A vessel that has been dismantled has definitely gone and can be written off the books. Those that are out of service but still extant must be monitored – an old warship is dangerous in the wrong hands and rival powers can learn a lot from the possession of a former navy ship.

Some warships are transferred to other users, typically the planetary navy of a world rich enough to operate warships of its own. Planetary navies may not feel the need for a jump-capable force, in which case jump drives may be removed, creating a powerful in-system defensive asset whose systems, even if they are old, are interoperable with those of the current generation of Imperial Navy ships. Veterans of the Imperial Navy who go into service with a planetary force sometimes find themselves crewing a ship they served aboard earlier in their career.

Other end users include the Scout Service, which sometimes buys vessels for conversion into exploration platforms and corporate fleets. Regulations exist governing what systems can be carried aboard a vessel in private hands; often the spinal weapon of a warship will be disabled by the removal of critical components, although there have been occasions where these components were then mysteriously ‘lost’, giving a well-connected corporate noble a vessel capable of taking on all comers.

Those vessels that do not find another home or are too decrepit for mothballing are often expended as targets, testing weapons under live conditions. This is a rather sad end for a well-liked warship and large-scale campaigns to save a vessel are not uncommon. These occasionally succeed, with ancient ships assigned to the navy’s ‘honour squadrons’ to participate in ceremonial occasions. Most ships, however, are destined to be dismantled or blasted to pieces at the end of their career.

C H A P T E R - T H R E E

OFFICERS AND CREW

A warship is a huge and complex system, comprising both machinery and people. It is beyond the abilities of any one person to completely control all functions of a large ship, even under routine conditions. Those who try to micromanage everything inevitably overload themselves and prevent subordinates from doing their own jobs properly. A well-run ship is best thought of as a set of more or less autonomous systems and sub-systems, each carrying out its function and feeding the results back to the officers in command.

CREW BRANCHES AND DEPARTMENTS

A warship has a clear chain of command, with rules for who can give orders to whom and who takes over when no-one more senior is available. This can happen due to loss of internal communications, disablement of personnel or far more routine reasons – such as crewmembers being given a task and then expected to carry it out without endless oversight.

The commanding officer of a warship is known as its captain, whatever rank he may actually hold. Smaller vessels such as destroyers might be commanded by a lieutenant-commander, cruisers by a commander and capital ships are – in theory – always commanded by a full captain. In wartime or other unusual circumstances these rules are subject to expediency but the senior command structure is ironed out as soon as possible. Thus, normally, a cruiser will have a commander as its senior officer or possibly a full captain. These more experienced officers lead task forces and squadrons, eventually moving up to a capital ship command or straight to commodore.

The captain of a warship makes big-picture policy decisions, implemented by his crew. He may take a look at the details when there is time but for a ship to function properly the officers must give the commander only as much information as he needs. The captain of a cruiser in action does not need to know everything about the situation; he does not have time for a lengthy lecture about the possibility of power failure on two of the ship's hundred-odd laser turrets and the exact number of reloads available for the missile bays. What he needs to know is that the ship is combat-capable but missiles are getting low.

The captain is assisted by his executive officer, or XO, who manages the day-to-day running of the ship. The XO is more concerned with details than the captain and is expected to have up-to-date information available on all manner of subjects. Large ships typically have a backup command facility far enough from the main bridge that a direct hit will not take both out of action. This is usually the XO's combat station, from where he directs operations, such as damage control, and takes over the ship if the bridge is inoperable.

The crew is divided into departments, each with its own officers, mostly specialists who must know at least a little about the work of other departments in order to co-operate with them. The Imperial Navy divides its personnel into branches, with most officers and crew spending their entire career in one branch.

Flight branch deals with bridge operations such as sensors, astrogation and piloting the ship. Subordinate craft also need a pilot (and often a co-pilot). Personnel who fulfil other functions such as engineering aboard a small craft come from the appropriate department; only those who operate bridge controls belong to the flight branch.

Gunnery branch includes gunners, missile technicians, electronic warfare specialists, sensor operators and so forth. When the vessel is not in combat, gunnery personnel perform maintenance on equipment and provide additional support to other departments. Typically, this means basic maintenance and technical tasks – warship crews are set up such that some of the routine work is done by specialists who have no pressing tasks in their own department, rather than having gunners lounging about whilst non-specialists clean the decks and service galley ovens.

Engineering branch operates drives, power systems and any heavy machinery that may be aboard. Where there is crossover, such as torpedo hoists, the system is the responsibility of its specialist branch. Engineering crew and officers tend to be the busiest of all departments – a ship can coast through space without the flight crew needing to do much but drives and power plants must be constantly monitored.

Technical branch is responsible for computers and light machinery, which is not the property of another department, and supports all departments when specialist assistance is required. Technical personnel might be called upon to assist a gunnery team with a stuck turret traverse, whilst others are working on an upgrade to the ship's cyber-security package. Technical branch has a very varied workload and is rarely short of things to do.

Medical branch is small and provides medical support as necessary. Doctors and surgeons are commissioned officers but are not in the ship's chain of command. In the past, medical officers have taken over a vessel in the case of catastrophic damage but only as an emergency expedient rather than something that has rules in place. Normally a medical officer, however senior, will defer to any 'fighting' officer if one is available.

Crew branch is a non-specialist arm, although there are specialisms within the branch. Crew personnel keep the ship running day-to-day and undertake damage control operations in combat. Some crew personnel have a specific role that consumes all of their on-duty hours, such as administrators and chefs, but others are multiskilled at a fairly low level and undertake basic maintenance, security and similar tasks when they are not called upon to provide labour. A crewmember's day can be quite varied, involving heavy work bringing supplies aboard for a mission, general cleaning and routine maintenance, then a couple of hours running errands for the officer of the watch.

Line branch is for officers only and is a non-specialist department. Command officers (the captain and XO) transfer to the Line when they assume their first position of command and other officers may also belong. Some are on their way to command, undertaking a period of general orientation or cross-training to enable better understanding of departments they have not served in. Others fulfil necessary tasks but whilst they might climb the ranks to a high level, they will never go to command college and take over a starship. These officers usually transfer to Staff when they reach lieutenant-commander and include administrators, lawyers, chaplains and officers who specialise in areas such as damage control, liaison with planetside governments and shipboard security. Some specialist vessels carry officers who have a very narrow role such as experts in biochemical warfare or a scientific field. Whilst assigned to a ship's company, such officers are in Line branch and wear its insignia although they are not in the chain of command for the ship.

Staff branch is open to both enlisted and commissioned personnel. The Staff branch contains most non-fighting personnel of the navy, including administrative personnel who handle recruitment, training, pensions and general support tasks for the navy. The Staff also contains some extremely specialised officers, such as theoretical gravitics experts, training officers and accountants. When permanently assigned to a ship's company, specialists and their supporting enlisted personnel are part of the Line or Crew departments but those who are aboard for a specific mission are not in the ship's chain of command and remain part of the Staff branch. There are several sub-branches within Staff including procurement, intelligence, research & development, training, astrophysics, diplomacy & liaison and some departments with bland sounding names and obscure remits whose personnel are strangely vague about what they do.

Crew Requirements

The system given in High Guard includes a considerable amount of 'wiggle room' for the Referee. Crew requirements for larger ships can be reduced by up to two-thirds but this should not be done as a blanket reduction. Instead, the Referee should examine the crewing requirements of the vessel and assign personnel accordingly, which will result in a figure somewhere between the upper and lower requirements postulated by *High Guard*.

The reduction of nominal crew figures will not fall evenly upon all departments. Concentrated equipment such as drives and power plant, and maintenance or technical crews, can be reduced considerably from the full figure given in *High Guard*, but weapon systems and small craft may still require most or all of the nominal crew level.

The number of officers required to properly run a ship depends very much on how many different types of specialist system exist and how much compartmentalisation of systems exists. There is some crossover between crew numbers and officers; for example some of the ship's engineering crew requirement might be provided by junior officers and similarly some senior petty officers might be included among the required officer complement noted by *High Guard*.

In short, the system in *High Guard* is entirely sufficient to create a ship, in general terms, and this is fine if it is encountered occasionally. If a campaign is set aboard a major warship, then the Referee should take the time to determine exactly what level of staffing is required to operate the vessel.

CREWING A WARSHIP

For all the systems integration and advanced electronics aboard a vessel, it is the crew who determine whether the ship will be an effective fighting platform or an expensive spacegoing target. It is people who make decisions and people who implement them, all the way down the chain of command from the captain to the enlisted personnel carrying out the task.

The navy seeks to recruit the best people for the job and to train them to be as effective as possible. Some are augmented with cybernetic systems or come from cultures where they are already augmented before joining the navy. Others have natural advantages such as greater dexterity or agility in microgravity. However, in the end it is the ability to make good decisions under pressure, function as a team and reliably get the job done no matter what is going on that makes a good crew. Other advantages are of little use if not well applied.

It is true that some staffing decisions are made for political reasons. Nobles tend to receive assignments suited to their political status – although not all nobles entering the navy can expect a prestigious posting. Officers from certain colleges, or who have connections to megacorporations that supply the navy with equipment, may be placed more for political reasons than suitability for the post. And of course, some personnel are less effective than others but ships still have to be crewed. Many vessels have a number of 'difficult' crewmembers and a few incompetents among their company who cannot always be weeded out, not least for budgetary reasons. It costs far more to train a new crewmember than retain one who has already been through the process so, as they say, 'once you're in, you're in'. The recruitment process does not always screen out poor prospects and sometimes the navy must simply make do with what it can get.

The recruitment net is spread wide in the hope of attracting as much talent as possible. This means the navy is open to almost all races found within the borders of the Imperium. There are a few exceptions, mainly those who cannot possibly be accommodated on a starship without radical redesign or those culturally or temperamentally unsuited to naval service. The majority of crewmembers tend to be human or humanoid, with similar requirements in terms of atmosphere, internal gravity and living conditions. In general, diet can be accommodated within the normal mess and galley system but there are exceptions.

Some species and cultures have special dietary requirements, such as compounds that are unpleasant or noxious to other species. Whilst segregation of a crew is undesirable in most circumstances, many ships have smaller galley facilities to deal with specialist requirements or keep groups with conflicting requirements from spoiling one another's meals. Some of these mess areas also have tables and chairs arranged for unusually large personnel or those who need particular seating arrangements. Whilst the main mess halls can be configured for anyone at need, it is generally easier to tailor an area to those who will use it most frequently, reducing the amount of time spent configuring the larger mess halls.

These considerations also apply to equipment. There is an unspoken but obvious bias in recruitment towards races who can use standard equipment, with many unusual species serving in specialist roles aboard vessels designed or converted to accommodate them. However, talent is more important than shape or size and it is always possible to find a crewmember whose hands or equivalent are not well suited to human equipment. The navy tries to make equipment and controls as generic as possible but in some cases a ship must be set up for its more unusual crewmembers.

The navy maintains several standard species-accommodation packages such as the Virushi Pack, which is geared to members of that very large race. It is not uncommon for these modifications to be left in place once installed, creating a situation where some vacc suit lockers contain something that looks like a pressurised tent with a glass dome on top.

Regulations for uniform and procedures are generally presented with 'humans and similar species' as the baseline and variations for other species. Whilst it is unacceptable to sideline personnel on the basis of race, manuals for drills and parades recognise that it can be absolutely impossible to achieve anything but chaos when members of very different species are mixed in formation. Where possible, groups of similarly-enabled personnel are formed, although sometimes a ship will have a single member of a race incompatible with standard drill movements.

This can sometimes be an advantage; many ships' companies invent creative variations on the standard drill evolutions to put on a show for visitors. For routine purposes, the usual solution is to have blocks of humans and similar creatures carrying out standard drill and any unusual personnel in solo roles such as flag bearers or acting as pivot points for the main body. Most vessels have a large number of flags and pennants denoting battle honours or signifying a division of the ship's crew and can usually find a useful role for personnel of any shape.

C H A P T E R - F O U R

THE ELEMENT CRUISER FAMILY

The Element family of cruisers (also called the Lurissha family) and all of its many variants, modifications and close relatives began as the prosaically named Requirement CC-1054 (Fleet Cruiser, Multirole). Over the decade following the publication of the requirement, a number of designs were presented, with contenders narrowed to three by the year 1063. At this time no great urgency was felt and it was not until 1067 that the final selection was made.

Proposal XCC-1061 (revised) was selected largely because it might also fulfil an upcoming need for a light cruiser design (Projected Requirement CL-1070) and had significant economic advantages. Proposal BC-1055, an ambitious design little short of a capital ship, remained a strong contender and was favoured by some members of the procurement board for its very high capabilities, yet was ultimately rejected on cost grounds. Not only was BC-1055 potentially very expensive to build, it would also be excessively manpower-intensive. Salaries represent a large segment of the naval budget and BC-1055 was ultimately deemed too expensive to operate.

The third contender, which ended up as Proposal CC-1062, was revised several times to suit the evolving parameters of the Official Requirement. It began as a missile-heavy design and evolved into a more conventional heavy cruiser on a slightly increased tonnage. A stripped-down version of CC-1062 eventually went into production as the sublight-only-capable Kekakhar-class heavy monitor, intended for the planetary navy market. It has met some success there, mainly with worlds along the Solomani border that feel the need for enhanced system security.

XCC-1061 reached the prototype stage in 1070, with the lead ship completing trials the following year. Series production began in 1071, with the first vessels reaching the fleet from 1073. A twelve-year refit-and upgrade programme was envisaged but this quickly slipped to fifteen years, then twenty-one. Most early production ships have undergone one or two major refits, with some already converted to other roles or disposed of to other users.

By the time the first ships entered service, the design had evolved considerably away from the original CC-1054 requirement. This is not uncommon, given the lead times involved in starship design, development and construction, yet in the case of Project CC-1061 the process of evolution led to three broadly similar vessels now classed as separate designs, with multiple variants of each.

PROJECT CC-1061

Project CC-1061, as the design was designated once agreed by the procurement board, took an unusual approach to construction. The vessel was to be built as a main hull with two pairs of 'pods' containing some of the ship's systems. This permitted construction to be shared between several yards, with benefits for the economies of all worlds involved in the project and facilitated modification in the event that alternative capabilities were later required.

The hull form of Project CC-1061 is a partially streamlined structure consisting of a forward command section, engineering and drives section aft, and a long spine connecting the two. This contains the collimation tunnel for the spinal mount and some subsidiary systems. It also has connection points for pods, which are attached in pairs. The pods are an integral part of the design; whilst the ship can operate with no pods attached, its capabilities are low and the ability to resist vigorous manoeuvring is reduced. The pods are attached by a framework that seems delicate compared to the spine of the ship but can support the mass of a 2,600 ton pod during high-g turns.

Compartmentalisation is good, as might be expected. The fore and aft sections are constructed as separate units, as is the spine and each pod. Once bought together these components create a powerful fighting ship, which has the potential for upgrade or re-use of components from a catastrophically damaged vessel. Pods can be replaced or fitted to another ship's spine; a wrecked main hull does not mean the whole ship has to be written off.

This modularity not only allowed Project CC-1061 to be dispersed among competing shipyards and manufacturers but also permitted the creation of what are essentially separate but related vessels all built around the same pod design.

The initial project was put into production as the Ghalalk-class armoured cruiser, a 50,000 ton vessel consisting of a 39,600 ton main hull and four 2,600 ton pods. It is built around a powerful particle accelerator and is intended to fulfil the multirole fleet cruiser role originally envisaged, although any particular vessel can be outfitted with different pods for another role at need.

Soon after production began, Project CC-1061 (Enhanced Capability) was rushed through development, making use of the already designed pods to create a larger heavy cruiser. Project CC-1061 (Enhanced Capability) went into series production in 1074, initially under the designation 'Stretch Ghalalk' but later in its own right as the 75,000 ton Amara-class heavy cruiser. Carrying six pods on an elongated main hull rather than the four of the Ghalalk, the Amara was intended as a more capable alternative undertaking a broadly similar role. It was envisaged that, where possible, Amaras would remain with the fleet whilst the Ghalalk undertook patrols and guardship deployments but, in practice, the two types are used interchangeably.

Project CC-1061 (L) followed in 1077, using a smaller central hull to carry a single pair of pods. Designated the Khumakirri-class, this 'Mini Ghalalk' is a light cruiser intended for patrol and escort work. It carries a smaller spinal mount, with a much shorter collimating tube resulting in reduced effectiveness against major warships. The Khumakirri-class is quite capable of swatting destroyers however, which is to a great extent its intended role.

Other versions of the Ghalalk design are also in limited service, using the same standard pods to create vessels tailored to a range of roles. Collectively, all the Project CC-1061 ships are known as the Element family of cruisers.

NAVAL ARCHITECT NOTES

The main hulls of the Element cruisers contain the primary and secondary armament, drives and control systems. The jump and manoeuvre drives are sufficient to provide strategic and tactical mobility to the entire vessel, with or without pods attached.

Sufficient fuel is carried in the main hull of most vessels to make a 4-parsec jump with pods attached and all three configurations are theoretically capable of jump-5 without pods. The Khumakirri-class lacks the internal fuel to do this, although it will maintain 7g of thrust without them.

These ships are not intended to operate without pods but the internal fuel tankage means the ship can make transit from shipyard to fitting-out location or undertake space trials before pods are fitted. Installing pods is a dockyard job requiring several weeks of work, as they become an integral part of the final design and are not a detachable or breakaway component.

AMARA-CLASS MAIN HULL

TL15		TONS	COST (MCr)
Hull	59,400 tons, Standard	-	2,700
	Reinforced	-	1,350
	Radiation Shielding	-	1,350
Armour	Bonded Superdense, Armour: 8	3,456	2,592
M-Drive	Thrust 6 (assumes 75,000 tons)	4,500	9,000
J-Drive	Jump 4 (decreased fuel, assumes 75,000 tons)	7,505	14,071.75
Power Plant	Fusion (TL15), power 90,000	4,500	9,000
Fuel Tanks	J-4, 8 weeks of operation	27,900	-
Bridge	Bridges x2, Holographic Controls	120	937.5
	Command Bridge, Holographic Controls	80	703.125
Computer	Core/100 and Core/90	-	250
Sensors	Advanced (distributed arrays) x2	30	31.8
	Military Countermeasures Suites x2	30	56
	Enhanced Signal Processing x2	4	16
Weapons	Spinal - Particle Accelerator (improved, 2DD)	5,600	2,600
	Fusion Barbettes x16	80	64
	Triple Turrets (sandcasters) x20	20	35
	Triple Turrets (beam lasers) x30	30	75
	Point Defence Batteries (type III) x2	40	40
Ammunition	Sandcaster Barrel Storage (400 barrels)	20	-
Screens	Meson Screens x10	100	200
	Nuclear Dampers x10	100	100
Armoured Bulkheads	Power Plant	450	90
	Spinal Mount	560	112
	Meson Screen	10	2
	Nuclear Damper	10	2
	Bridge	12	2.4
	Command Bridge	8	1.6
	Sensors	6	1.28
Systems	Full Hangar (240 tons)	480	96
	Repair Drones	750	150
	Sensor Stations x8	8	4
	Briefing Rooms x8	32	16
	Armoury	50	12.5
	Brigs x4	16	1

CREW

CAPTAIN, PILOTS X 15, ASTROGATORS X 2, ENGINEERS X 175, MAINTENANCE X 60, MEDICS X 4, GUNNERS X 146, STEWARDS X 12, ADMINISTRATORS X 16, OFFICERS X 66

RUNNING COSTS

MAINTENANCE COST
Cr3842000/month

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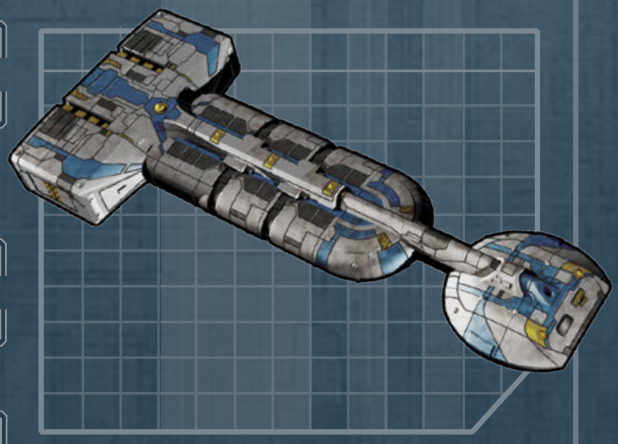
PURCHASE COST
MCr46102.355

POWER REQUIREMENTS

45000 MANOEUVRE DRIVE	15000 BASIC SHIP SYSTEMS
30000 JUMP DRIVE	32 SENSORS
200 FUEL PROCESSOR	2730 WEAPONS



41250
HULL POINTS

TL15		TONS	COST (MCr)
	Fuel Scoop	-	1
	Fuel Processor (4,000 tons/day)	200	10
	Medical Bays x6	24	12
	Additional Airlocks x15	30	3
	UNREP System (200 tons/hour)	10	5
	Workshops x4	24	3.6
Staterooms	High x3	18	2.4
	Standard x300	1,200	150
	Barracks x200	400	20
Software	Manoeuvre/0	-	
	Intellect	-	1
	Jump Control/4	-	0.4
	Evade/3	-	3
	Advanced Fire Control/3	-	18
	Auto-Repair/2	-	10
	Anti-Hijack/3	-	10
	Battle System/1	-	18
	Broad-Spectrum EW	-	14
	Point Defence/2	-	12
	Virtual Crew/0	-	1
	Virtual Gunner/0	-	1
	Library	-	-
Common Areas		800	80
Cargo		227	-

TOTAL: MCr 46102.355

* DATA PRESENTED HERE ASUMES THAT ALL 2/4/6 PODS ARE EMPTY

GHALALK-CLASS MAIN HULL

TL15		TONS	COST (MCr)
Hull	39,600 tons, Standard	-	1,980
	Reinforced	-	990
	Radiation Shielding	-	990
Armour	Bonded Superdense, Armour: 8	2,534	1,900.8
M-Drive	Thrust 6 (assumes 50,000 tons)	3,000	6,000
J-Drive	Jump 4 (decreased fuel, assumes 50,000 tons)	5,005	9,384.375
Power Plant	Fusion (TL15), power 60,000	3,000	6,000
Fuel Tanks	J-4, 8 weeks of operation	18,600	-
Bridge	Bridges x2, Holographic Controls	120	625
	Command Bridge, Holographic Controls	80	468.75
Computer	Core/100 and Core/90	-	250
Sensors	Advanced (distributed arrays) x2	30	31.8
	Military Countermeasures Suites x2	30	56
	Enhanced Signal Processing x2	4	16
Weapons	Spinal - Particle Accelerator (improved, 1DD)	2,800	1,300
	Fusion Barbettes x12	60	48
	Triple Turrets (sandcasters) x20	20	35
	Triple Turrets (beam lasers) x20	20	50
	Point Defence Batteries (type III) x2	40	40
Ammunition	Sandcaster Barrel Storage (800 barrels)	40	-
Screens	Meson Screens x10	100	200
	Nuclear Dampers x10	100	100
Armoured Bulkheads	Meson Screen	10	2
	Nuclear Damper	10	2
	Bridge	10	2.4
	Command Bridge	8	1.6
	Sensors	6	1.28
Systems	Full Hangar (240 tons)	480	96
	Repair Drones	500	100
	Sensor Stations x8	8	4
	Briefing Rooms x8	32	4
	Armoury	50	12.5
	Brigs x4	16	1
	Fuel Scoop	-	1
	Fuel Processor (4,000 tons/day)	200	10

CREW

CAPTAIN, PILOTS X 15, ASTROGATORS X 2, ENGINEERS X 125, MAINTENANCE X 40, MEDICS X 3, GUNNERS X 115, STEWARDS X 10, ADMINISTRATORS X 12, OFFICERS X 62

RUNNING COSTS

MAINTENANCE COST
Cr2581000/month

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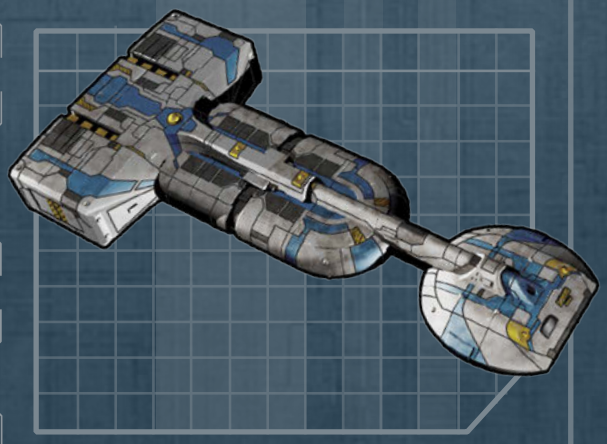
PURCHASE COST
MCr30971.505

POWER REQUIREMENTS

30000 MANOEUVRE DRIVE	10000 BASIC SHIP SYSTEMS
20000 JUMP DRIVE	32 SENSORS
200 FUEL PROCESSOR	2080 WEAPONS



27500 HULL POINTS

TL15		TONS	COST (MCr)
	Medical Bays x6	32	12
	Additional Airlocks x12	24	2.4
	UNREP System (200 tons/hour)	10	5
	Workshops x4	24	3.6
Staterooms	High x3	18	2.4
	Standard x250	1,000	125
	Barracks x200	400	20
Software	Manoeuvre/0	-	
	Intellect	-	1
	Jump Control/4	-	0.4
	Evade/3	-	3
	Advanced Fire Control/3	-	18
	Auto-Repair/2	-	10
	Anti-Hijack/3	-	10
	Battle System/1	-	18
	Broad-Spectrum EW	-	14
	Point Defence/2	-	12
	Virtual Crew/0	-	1
	Virtual Gunner/0	-	1
	Library	-	-
Common Areas		800	80
Cargo		227	-

TOTAL: MCr 30971.505

* DATA PRESENTED HERE ASUMES THAT ALL 2/4/6 PODS ARE EMPTY

KHUMAKIRRI-CLASS MAIN HULL

TL15		TONS	COST (MCr)
Hull	19,800 tons, Standard	-	990
	Reinforced	-	495
	Radiation Shielding	-	495
Armour	Bonded Superdense, Armour: 8	1,267	950.4
M-Drive	Thrust 6 (assumes 25,000 tons)	1,500	3,000
J-Drive	Jump 4 (decreased fuel, assumes 25,000 tons)	2,505	4696.875
Power Plant	Fusion (TL15), power 30,000	1,500	3,000
Fuel Tanks	J-2, 8 weeks of operation	4,800	-
Bridge	Bridges x2, Holographic Controls	120	312.5
	Command Bridge, Holographic Controls	80	234.375
Computer	Core/100 x2	-	260
Sensors	Advanced (distributed arrays) x2	30	31.8
	Military Countermeasures Suites x2	30	56
	Enhanced Signal Processing x2	4	16
Weapons	Spinal - Particle Accelerator (improved, 1DD)	2,800	1,300
	Fusion Barbettes x12	60	48
	Triple Turrets (sandcasters) x20	20	35
	Triple Turrets (beam lasers) x15	15	37.5
	Point Defence Batteries (type III) x2	40	40
Ammunition	Sandcaster Barrel Storage (800 barrels)	40	-
Screens	Meson Screens x10	100	200
	Nuclear Dampers x10	100	100
Armoured Bulkheads	Meson Screen	10	2
	Nuclear Damper	10	2
	Bridge	12	2.4
	Command Bridge	8	4
	Sensors	6	1.28
Systems	Full Hangar (240 tons)	480	96
	Repair Drones	250	50
	Sensor Stations x6	6	3
	Briefing Rooms x4	16	2
	Armoury	50	12.5
	Brigs x4	16	1
	Fuel Scoop	-	1
	Fuel Processor (4,000 tons/day)	200	10

CREW

CAPTAIN, PILOTS X 15, ASTROGATORS X 2, ENGINEERS X 75, MAINTENANCE X 25, MEDICS X 3, GUNNERS X 95, STEWARDS X 8, ADMINISTRATORS X 10, OFFICERS X 48

RUNNING COSTS

MAINTENANCE COST
Cr1394000/month

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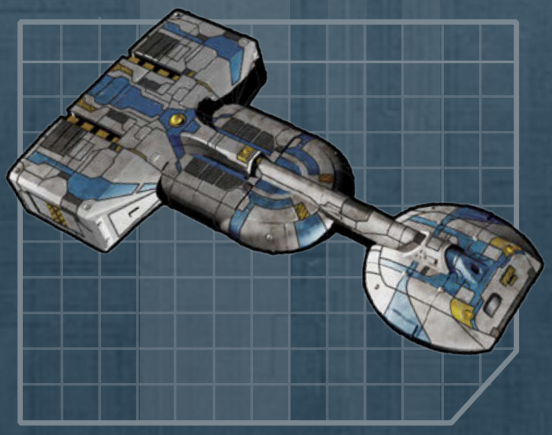
PURCHASE COST
MCr16730.63

POWER REQUIREMENTS

15000 MANOEUVRE DRIVE	5000 BASIC SHIP SYSTEMS
10000 JUMP DRIVE	32 SENSORS
200 FUEL PROCESSOR	2015 WEAPONS



11000
HULL POINTS

TL15		TONS	COST (MCr)
	Medical Bays x6	24	12
	Additional Airlocks x10	20	2
	UNREP System (200 tons/hour)	10	5
	Workshops x4	24	3.6
Staterooms	High x3	18	2.4
	Standard x200	800	100
	Barracks x200	400	20
Software	Manoeuvre/0	-	
	Intellect	-	1
	Jump Control/4	-	0.4
	Evade/3	-	3
	Advanced Fire Control/3	-	18
	Auto-Repair/2	-	10
	Anti-Hijack/3	-	10
	Battle System/1	-	18
	Broad-Spectrum EW	-	14
	Point Defence/2	-	12
	Virtual Crew/0	-	1
	Virtual Gunner/0	-	1
	Library	-	-
Common Areas		1,000	100
Cargo		1,449	-

TOTAL: MCr 16730.63

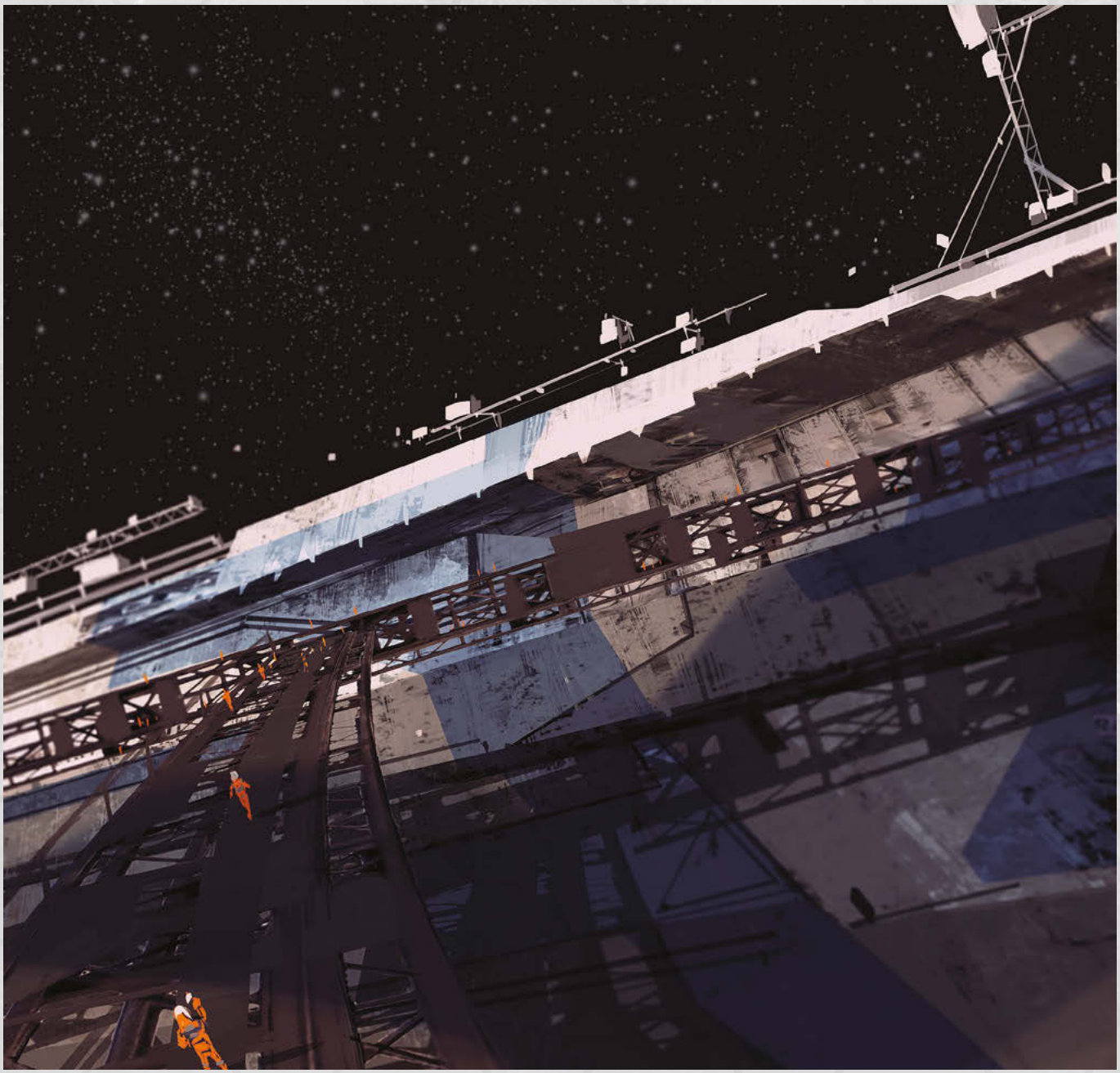
* DATA PRESENTED HERE ASUMES THAT ALL 2/4/6 PODS ARE EMPTY

C H A P T E R - F I V E

POD CONFIGURATIONS

While the pods carried by the Element family of cruisers are not 'hot-swappable', instead taking several weeks to refit, they do allow each vessel to be exceedingly flexible from a strategic point of view, allowing them to adopt many different roles throughout their lives, as required. The large Amara-class carries six pods, while the Ghalalk-class carries four. The smaller Khumakirri-class carries two pods.

The standard configuration for a Ghalalk or Amara class cruiser uses missile pods, all of the same internal design. However, a ship might be reconfigured with other pods for a particular mission or even given custom-built pods to create a one-off variant.



MISSILE POD

TL15		TONS	COST (MCr)
Hull	2,600 tons, Standard	-	130
	Reinforced	-	65
	Radiation Shielding	-	65
Armour	Bonded Superdense, Armour: 8	166.4	124.8
Power Plant	Fusion (TL15), power 2,000	100	200
Fuel Tanks	8 weeks of operation	20	-
Bridge	Small	30	6.5
Weapons	Medium Missile Bays x 12	1,200	300
	Triple Turrets (beam lasers) x 12	12	30
Ammunition	Missile Storage (5,760 Missiles)	480	-
Armoured Bulkheads	Missile Storage	48	9.6
Staterooms	Standard x50	200	25
Common Areas		300	30
Cargo		44	-

TOTAL: MCr 985.9

CREW

OFFICERS X 5, GUNNERS X 48, ENGINEERS X 3

RUNNING COSTS

MAINTENANCE COST
Cr82158/month

PURCHASE COST
MCr985.9

POWER REQUIREMENTS

756	520
WEAPONS	BASIC SHIP SYSTEMS

1144
HULL POINTS

The missile pod exists primarily to provide the cruiser with heavy standoff attack capability. It mounts twelve large missile bays in two rows of six along the outer surface, each with its own armoured magazine. The fire of these weapons is normally coordinated by the ship's central gunnery director but local control is exercised from a missile direction centre within the pod. Similarly, the beam laser turrets mounted on the dorsal and ventral surfaces of the pod are normally tied into the ship's overall defence net but can be directed locally if need be.

Under most circumstances, each pod's commanding officer runs his pod and directs its weapons from its own command centre, with instructions passed down from the fire direction centre or directly from the bridge. The pod has its own power plant, which is more than sufficient to support its own systems. In an emergency, power can be supplied to a neighbouring pod and local power plants also assist in sharing the load of shipboard operations.

The missile pod also incorporates accommodation for personnel sufficient to run its systems, plus additional accommodation and living space, which makes the vessel more habitable. This is useful in reliving crew fatigue on a long voyage.

FUEL POD

TL15		TONS	COST (MCr)
Hull	2,600 tons, Standard	-	130
	Reinforced	-	65
	Radiation Shielding	-	65
Armour	Bonded Superdense, Armour: 8	166.4	124.8
Power Plant	Fusion (TL15), power 1,000	50	100
Fuel Tanks	8 weeks of operation,	10	-
	For main vessel	2,250	-
Weapons	Triple Turrets (beam lasers) x 6	6	15
Staterooms	Standard x12	48	6
Common Areas		48	4.8
Cargo		21	-

TOTAL: MCr 510.6

CREW

OFFICER, ENGINEERS X 2, GUNNERS X 6

RUNNING COSTS

MAINTENANCE COST
Cr430000/month

PURCHASE COST
MCr510.6

POWER REQUIREMENTS

35
WEAPONS

520
BASIC SHIP SYSTEMS

1144
HULL POINTS

Fuel pods are little more than huge fuel tanks, although they contain a small power plant to augment the ship's own systems, along with point-defence weaponry. Fuel pods do not carry a local command centre but have accommodation for their small number of engineering and gunnery personnel. Provision is slightly more than needed, on the grounds that a ship carrying extra fuel is likely to be sent on longer missions and more crew space translates to reduced fatigue.

All vessels in the Element family, other than the occasional one-off variant, use reduced-fuel-requirement drives. The fuel capacity of pods is calculated so that increasing the jump capacity of a ship by one parsec requires one pod per 25,000 tons of the overall vessel's size.

HANGAR POD

TL15		TONS	COST (MCr)
Hull	2,600 tons, Standard	-	130
	Reinforced	-	65
	Radiation Shielding	-	65
Armour	Bonded Superdense, Armour: 8	166.4	124.8
Power Plant	Fusion (TL15), power 2,000	100	200
Fuel Tanks	8 weeks of operation	20	-
Bridge	Small	30	6.5
Weapons	Triple Turrets (beam lasers) x12	12	30
Systems	Launch Tubes (20tons) x2	400	200
	Recovery Decks (20 tons) x4	800	400
	Full Hangar (180 tons) x2	720	144
Staterooms	Standard x60	240	30
Common Areas		100	10
Cargo		11	-

TOTAL: MCr 1405.3

CREW

OFFICERS X 3, PILOTS X 30, GUNNERS X 12, ENGINEERS X3

RUNNING COSTS

MAINTENANCE COST
Cr1170000/month

PURCHASE COST
MCr1405.3

POWER REQUIREMENTS

35
WEAPONS

520
BASIC SHIP SYSTEMS

1144
HULL POINTS

The hangar pod is designed to allow the rapid launch and recovery of small craft, typically light fighters or utility craft used for customs inspections and similar routine tasks.

Nominal complement is twenty-four 10-ton light fighters and six 20-ton launches. Twenty of these craft can be launched simultaneously and four recovered at once. Small craft operations are run from the pod's command centre, which can also direct the fire of its close-in defensive armament.

Sufficient accommodation is provided for the craft crews plus maintenance personnel, defensive gunners and engineers assigned to the pod's small power plant. The common areas have a tendency to become – unofficially at least – 'pilot's country', with non-flight personnel tolerated by invitation only. Some captains encourage this practice as enhancing esprit de corps among the pilots; others see it as divisive and insist that gunners and engineers be treated as equals in the pod's common areas.

MARINE OPERATIONS POD

TL15		TONS	COST (MCr)
Hull	2,600 tons, Standard	-	130
	Reinforced	-	65
	Radiation Shielding	-	65
Armour	Bonded Superdense, Armour: 8	166.4	124.8
Power Plant	Fusion (TL15), power 2,000	100	200
Fuel Tanks	8 weeks of operation	20	-
Bridge	Specialist Control Centre	40	6.5
Weapons	Triple Turrets (beam lasers) x12	12	30
Staterooms	Standard x24	96	12
	Barracks (300 personnel)	600	30
Systems	Sensor Stations x4	4	2
	Full Hangar (300 tons)	600	120
	Armoury	75	18.75
	Briefing Rooms x4	16	2
	Brigs x4	16	1
	Medical Bays x5	20	10
	Workshops x4	24	3.6
	Training Facilities (70 personnel)	140	28
Common Areas		600	60
Cargo		70	-

TOTAL: MCr 908.65

CREW

OFFICERS X 2, ENGINEERS X 3, GUNNERS X 24, PILOTS X 6, MARINES X 240

RUNNING COSTS

MAINTENANCE COST
Cr75721/month

PURCHASE COST
MCr908.65

POWER REQUIREMENTS

156	520
WEAPONS	BASIC SHIP SYSTEMS

1144
HULL POINTS

The marine operations pod is designed to carry and support additional marines over and above the ship's usual complement and provide additional small craft capacity to allow them to be deployed and recovered. The pod is armoured to the same standard as the main hull and mounts self-defence armament to ensure there is no gap in the parent vessel's point defences.

The pod's crew consists of engineers to run the power plant, point-defence gunners, a gunnery officer (typically an ensign) who controls the weapons battery and another officer (an ensign or sublieutenant) in overall command of the pod. In addition, one or more naval liaison officers may be assigned to the pod either to control small craft operations or provide information and relay orders to marines on the ground.

The marine operations pod is designed to house and deploy two companies of marines or other ground troops, plus additional personnel as necessary. It has more than enough armoury space to support its personnel and usually has accommodation left over unless significant numbers of additional personnel are carried. Training facilities and a medical unit are also provided, although under most circumstances serious casualties would be moved to the ship's main medical facility as soon as they are stabilised.

TORPEDO POD

TL15		TONS	COST (MCr)
Hull	2,600 tons, Standard	-	130
	Reinforced	-	65
	Radiation Shielding	-	65
Armour	Bonded Superdense, Armour: 8	166.4	124.8
Power Plant	Fusion (TL15), power 2,000	100	200
Fuel Tanks	8 weeks of operation	20	-
Bridge	Specialist Control Centre	40	6.5
Weapons	Medium Torpedo Bays x6	600	36
	Medium Fusion Gun Bays x6	600	96
	Triple Turrets (beam lasers) x12	12	30
Ammunition	Torpedo Storage (1080)	360	-
Armoured Bulkheads	Torpedo Storage	36	7.2
Staterooms	Standard x 50	200	25
Common Areas		300	30
Cargo		165.6	-

TOTAL: MCr 815.5

CREW

OFFICERS X 5, GUNNERS X 48, ENGINEERS X 3

RUNNING COSTS

MAINTENANCE COST
Cr67958/month

PURCHASE COST
MCr815.5

POWER REQUIREMENTS

570
WEAPONS

520
BASIC SHIP SYSTEMS

1144
HULL POINTS

A variant on the concept of the missile pod, the torpedo pod is actually a 'close combat pod' in that it does not only mount torpedo weapons. Additional fusion gun bays are mounted on the dorsal and outer surfaces, augmenting cruiser-close-range combat capabilities. Like most other pods, the torpedo pod has its own power plant and carries sufficient crew to operate all its systems.

ORBITAL ASSAULT POD

TL15		TONS	COST (MCR)
Hull	2,600 tons, Standard	-	130
	Reinforced	-	65
	Radiation Shielding	-	65
Armour	Bonded Superdense, Armour: 8	166.4	124.8
Power Plant	Fusion (TL15), power 2,000	100	200
Fuel Tanks	8 weeks of operation	20	-
Bridge	Specialist Control Centre	40	6.5
Weapons	Triple Turrets (beam lasers) x12	12	30
	Orbital Strike Missile Bays x6	300	96
	Orbital Strike Cannon Bays x6	300	30
Ammunition	Missile Stowage (1,200 missiles)	100	-
Staterooms	Standard x48	192	24
	Barracks (100 personnel)	200	10
Systems	Sensor Stations x4	4	2
	Full Hangar (100 tons)	200	40
	Armoury	25	6.25
	Briefing Rooms x 4	16	2
	Orbital Assault Systems x16	384	64
	OAS Capsules x200	200	50
	Orbital Support Systems x2	24	12
	OSS Capsules x6	36	3
	Workshops x 2	24	1.8
	Training Facilities (20 personnel)	40	8
Common Areas		200	20
Cargo		23	-

TOTAL: MCR 1110.35

CREW

OFFICER X 5, ENGINEERS X 3, GUNNERS X 48

RUNNING COSTS

MAINTENANCE COST
Cr92529/month

PURCHASE COST
MCr1110.35

POWER REQUIREMENTS

275
WEAPONS

520
BASIC SHIP SYSTEMS

1144
HULL POINTS

The orbital assault pod is often used in conjunction with the marine operations pod but is optimised for the delivery of troops planetside as quickly as possible and support of those forces in terms of both orbital gunfire and additional supplies landed to assist the attack.

Like most other pods, the orbital assault pod has its own control centre, power plant and point-defence weaponry along with accommodation for the crews using them. It can deliver 192 personnel at once, plus additional equipment, supplies and weaponry.

FIGHTER POD

TL15		TONS	COST (MCR)
Hull	2,600 tons, Standard	-	130
	Reinforced	-	65
	Radiation Shielding	-	65
Armour	Bonded Superdense, Armour: 8	166.4	124.8
Power Plant	Fusion (TL15), power 2,000	100	200
Fuel Tanks	8 weeks of operation	20	-
Bridge	Specialist Control Centre	40	130
	Sensor Stations x4	4	2
Weapons	Triple Turrets (beam lasers) x12	12	30
Armoured Bulkheads	Hangers	96	19.2
Staterooms	Standard x 80	320	40
Systems	Additional Airlocks x2	20	2
	Armouries x4	4	0.2
	Full Hangar (240 tons) x2	960	192
	Launch Tube (10 tons)	100	50
	Recovery Deck (20 tons) x2	400	200
	Workshop	144	21.6
	UNREP System	2	1
	Construction Decks (10 tons) x4	80	40
	Medical Bays x2	8	4
Common Areas		130	13

TOTAL: MCR 1339.8

CREW

COMMANDING OFFICER, OFFICERS X 6, PILOTS X 48, ENGINEERS X 12, MAINTENANCE X 12, GUNNERS X 12, MEDICS X 2

RUNNING COSTS

MAINTENANCE COST
Cr111650/month

PURCHASE COST
MCr1339.8

POWER REQUIREMENTS

60	520
WEAPONS	BASIC SHIP SYSTEMS

1144
HULL POINTS

Launch and recovery operations are normally as widely separated as possible on a 'real' carrier but this is not possible in a pod. Recovery is by way of a deck on the outer surface of the pod. Recovered craft are transferred by hoist into the hangar area and from there to maintenance or launch facilities depending upon their condition. Internal airlocks penetrate the armoured bulkheads around the hangars and allow maintenance bays to be crewed in a 'shirtsleeve' working environment, which greatly improves efficiency, although vacc suits are worn during combat operations.

The pod is designed to support and operate 48 light (10-ton) fighters, usually grouped as pairs into flights of four and squadrons of eight. Launch and recovery can be conducted simultaneously. A small UNREP system allows fighters to replenish life support supplies without entering the recovery/hangar/launch cycle, which is useful when maintaining a long-duration ready state.

The pod can support a full complement of 48 fighter pilots plus four fighter control officers, each of whom has a dedicated sensor/control station within the command centre of the pod. Fighter control officers and the pilots themselves answer to the pod commander, who is also a qualified fighter control officer.

Up to 24 support crew can work on the fighter complement at once, using the ship's open-plan workshop layout, which is part of the hangar complex. Seriously damaged craft or those requiring major maintenance are shifted to the four construction/repair bays as necessary. It is possible to keep a 48-fighter group in operation almost indefinitely with the resources of a single pod, providing sufficient spares and supplies are available.

FORWARD COMMUNICATIONS POD

TL15		TONS	COST (MCr)
Hull	2,600 tons, Standard	-	130
	Reinforced	-	65
	Radiation Shielding	-	65
Armour	Bonded Superdense, Armour: 8	166.4	124.8
Power Plant	Fusion (TL15), power 2,000	100	200
Fuel Tanks	8 weeks of operation	20	-
Bridge	Specialist Control Centre	40	130
	Sensor Stations x 4	4	2
Computer	Model/10		0.16
Weapons	Triple Turrets (beam lasers) x12	12	30
Staterooms	Standard x40	160	20
Systems	Full Hangar (200 tons) x4	1600	32
	Armouries x4	4	0.2
	Workshop	24	0.36
	UNREP System	2	1
	Additional Airlock	200	20
	Mail Distribution Array (advanced)	20	10
Common Areas		240	24
Cargo		14	-

TOTAL: MCr 2649.36

CREW

COMMANDING OFFICER, OFFICERS X 4, COURIER CREWS X 16, GUNNERS X 12, ENGINEERS X 6, MAINTENANCE X 6

RUNNING COSTS

MAINTENANCE COST
Cr220800/month

PURCHASE COST
MCr2649.36

POWER REQUIREMENTS

60	520
WEAPONS	BASIC SHIP SYSTEMS

1144
HULL POINTS

The forward communications pod is built around a group of jump-capable courier vessels. These may be sent on specific missions, such as to go to a particular world and pick up dispatches and general information, or may ply back and forth between the parent vessel and outposts or other ships in nearby systems. Relay chains of these small couriers are sometimes used to maintain communications between vessels on distant deployments and their home stations.

Information collation and distribution is handled by a dedicated computer and a small staff of communications analysts. There is some overlap in their function with the staff of an intelligence gathering pod but the role of this unit is to keep orders straight and ensure timely movement of information rather than trying to discern the complexities of intercepted communications.

Fuel for the courier craft is fed from the ship's main fuel processing unit. The module does not have one of its own but couriers can be directly fuelled from a tanker or fuel shuttle through the UNREP system. This is rarely used to refuel couriers outside the ship; they are instead brought aboard for maintenance and refuelling. Most commonly the UNREP system serves as a direct resupply route for the pod itself.

NAVAL COURIER

ISKIMKILUKHUIR

TL15		TONS	COST (MCr)
Hull	200 tons, Standard	-	10
	Radiation Shielding	-	5
M-Drive	Thrust 4 (energy efficient x 3)	8	24
J-Drive	Jump-3 reduced fuel requirement x 2, (energy efficient)	20	45
Power Plant	Fusion (TL15), power 120	6	12
Fuel Tanks	7 parsecs range, 8 weeks of operation	126.2	-
Bridge	Small	6	1
Computer	Computer/20	-	5
Sensors	Civilian Grade	1	3
Weapons	Dual Turrets (beam lasers) x 2	2	3
Systems	Fuel Scoop	-	1
	Fuel Processor (60 tons/day)	3	0.15
	Mail Distribution Array	10	20
Software	Manoeuvre/0	-	-
	Jump Control/3	-	0.3
	Library	-	-
Staterooms	Standard x 2	8	1
Common Areas		6	0.6
Cargo		2.8	-

TOTAL: MCr 131.05

CREW

ASTROGATOR, PILOT, ENGINEER, GUNNERS X 2

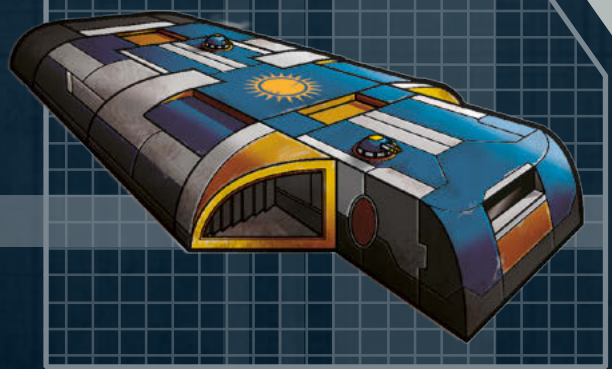
RUNNING COSTS

MAINTENANCE COST
Cr10920.8/month

PURCHASE COST
MCr131.05

POWER REQUIREMENTS

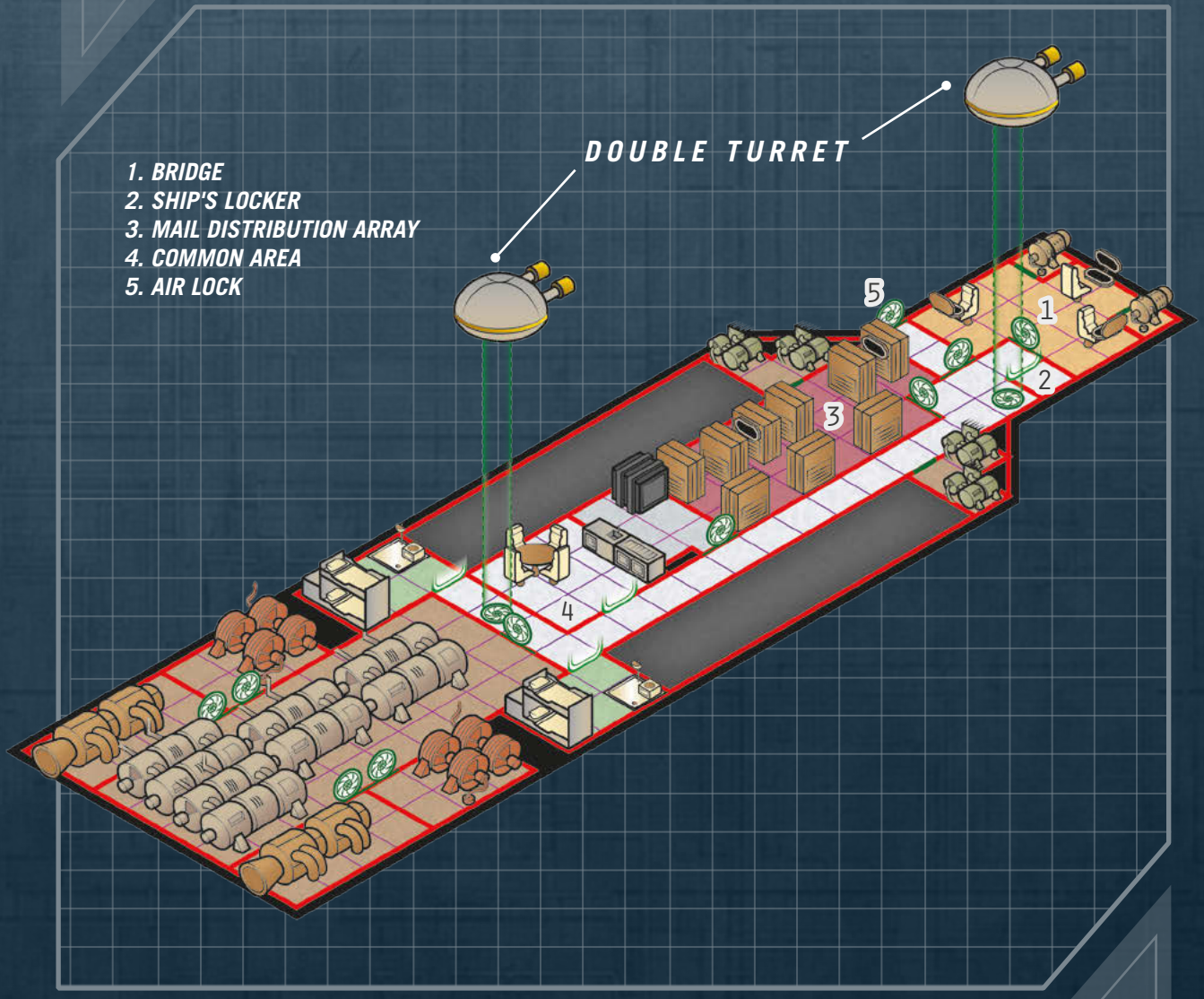
20 MANOEUVRE DRIVE	40 BASIC SHIP SYSTEMS
45 JUMP DRIVE	1 SENSORS
14 WEAPONS	3 FUEL PROCESSOR



80
HULL POINTS

The Iskimkilukhuir-class is not really a starship as such, in that it is not intended for independent operations. Vessels of this class are designed to move information, orders and critical personnel between bases or ships, and to be housed aboard a parent vessel or station when not en route. As a result, the design is cramped and uncomfortable to operate and has few applications outside its intended role.

One consequence of this is that the Iskimkilukhuir-class is an exception to the Imperial Navy's rule that all starships are commanded by an officer of at least lieutenant rank. An Iskimkilukhuir courier is numbered among the parent platform's subordinate craft and is incapable of doing much when acting independently, so is normally placed under the command of a junior officer. Typically, this is an ensign or sublieutenant, although if a properly qualified crew can be assembled from enlisted personnel the vessel might even be commanded by a petty officer.



ISOMETRIC DECKPLAN KEY

BUNK

FRESHER

WORKSTATION

G-CHAIR

LOW BERTH

CRATE

HATCH

IRIS VALVE (WALL)

IRIS VALVE (FOOR/CEILING)

INTERNAL WALL

HULL

FUEL PROCESSOR

POWER PLANT

JUMP DRIVE

MANOEUVRE DRIVE

1.5M

3M

EXPLORATION POD

TL15		TONS	COST (MCr)
Hull	2,600 tons, Standard	-	130
	Reinforced	-	65
	Radiation Shielding	-	65
Armour	Bonded Superdense, Armour: 8	166.4	124.8
Power Plant	Fusion (TL15), power 2,000	100	200
Fuel Tanks	8 weeks of operation	20	-
Bridge	Specialist Control Centre	40	130
	Sensor Stations x 12	12	6
Computer	Model/10		0.16
Weapons	Triple Turrets (beam lasers) x 12	12	30
	Medium Missile Bays x 2	200	50
Ammunition	Missile Magazine (600 missiles)	50	-
Staterooms	Standard x 40	160	20
Systems	Full Hangar (200 tons)	400	8
	Advanced Medium Observatory	400	500
	Chart Room x 2	32	2.5
	Briefing Room x 4	16	2
	Gravitational Analysis Suite	8	12
	Advanced Sensor Suite Semi-Distributed Arrays	15	15.9
	Deep Penetration Scanners	100	100
	Enhanced Signal Processing Suite	2	8
	Life Scanner Analysis Suite	1	4
	Mineral Detection Suite	-	5
	Scientific Operations Suite	48	38.4
	Laboratories (3 person) x5	60	15
	Armouries x 4	4	0.2
	Workshops x 4	24	0.36
	Additional Airlocks x 3	30	3
	Brig	4	0.25
	Specialist Equipment store x 2	2	0.1
	Library	4	4
Common Areas		320	32
Cargo		376	-

TOTAL: MCr 935.8

CREW

OFFICERS X 4, GUNNERS X 36, ENGINEERS X 3, SCIENTISTS X 15

RUNNING COSTS

MAINTENANCE COST
Cr780000/month

PURCHASE COST
MCr935.8

POWER REQUIREMENTS

WEAPONS	HULL POINTS	BASIC SHIP SYSTEMS
35	1144	520

The exploration pod is intended to convert a cruiser into a heavy exploration platform. It is enormously over-gunned for the role but that is sometimes an asset. The chances of running into an unexpected threat so severe that it requires heavy cruiser firepower to deal with are very small, however exploration ships are often the first contact a minor race or small interstellar polity has with the Imperium. A first impression of strength is a good start as far as Imperial authorities are concerned.

It is not uncommon for the Scout Service to pick up rumours of a new alien species or undiscovered power on the frontiers of explored space, only to have the navy sweep in and take over the first-contact mission. An exploration pod might therefore have a mixed scout/navy crew or be entirely crewed by scouts. In this case, a liaison officer is usually assigned and, given the unmilitary nature of most scout personnel, this is not a popular duty.

As with many exploration ships, common spaces and recreation areas are generous and supporting facilities for long-term missions are installed.

INTELLIGENCE OPS POD

TL15		TONS	COST (MCR)
Hull	2,600 tons, Standard	-	130
	Reinforced	-	65
	Radiation Shielding	-	65
Armour	Bonded Superdense, Armour: 8	166.4	124.8
Power Plant	Fusion (TL15), power 2,000	100	200
Fuel Tanks	8 weeks of operation	20	-
Bridge	Specialist Control Centre	40	130
Sensors	Advanced Sensor Suite Semi-Distributed Arrays	12	30
	Sensor Stations x24	24	12
	Deep Penetration Scanners	100	100
	Enhanced Signal Processing Suites x4	8	32
	Life Scanner Analysis Suites x4	4	16
	Military Countermeasures Suites x4	60	112
	Mineral Detection Suite		5
Computer	Model/10		0.16
Weapons	Triple Turrets (beam lasers) x12	12	30
	Medium Missile Bays x 2	200	50
	Missile Magazine (600 missiles)	50	-
Staterooms	Standard x40	160	20
	High x10	60	8
	Luxury x4	40	6
Systems	Full Hangar (400 tons)	800	160
	Brigs x2	8	0.5
	Armouries x4	4	0.2
	Briefing Rooms x4	16	2
	Gaming Space (120 persons)	180	1.08
	Laboratory (intelligence analysis)	120	30
	Mail Distribution Array (advanced)	20	10
	Library	4	4
	Studio (6 persons)	24	2.4
	Training Facilities (12 persons)	24	4.8
Common Areas		292	29.2
Cargo		55	-

TOTAL: MCR 2649.36

CREW

OFFICERS X 4, GUNNERS X 36, ENGINEERS X 3, SENSOR OPERATIVES X 36

RUNNING COSTS

MAINTENANCE COST
Cr780000/month

PURCHASE COST
MCr935.8

POWER REQUIREMENTS

35 WEAPONS

520 BASIC SHIP SYSTEMS

1144 HULL POINTS

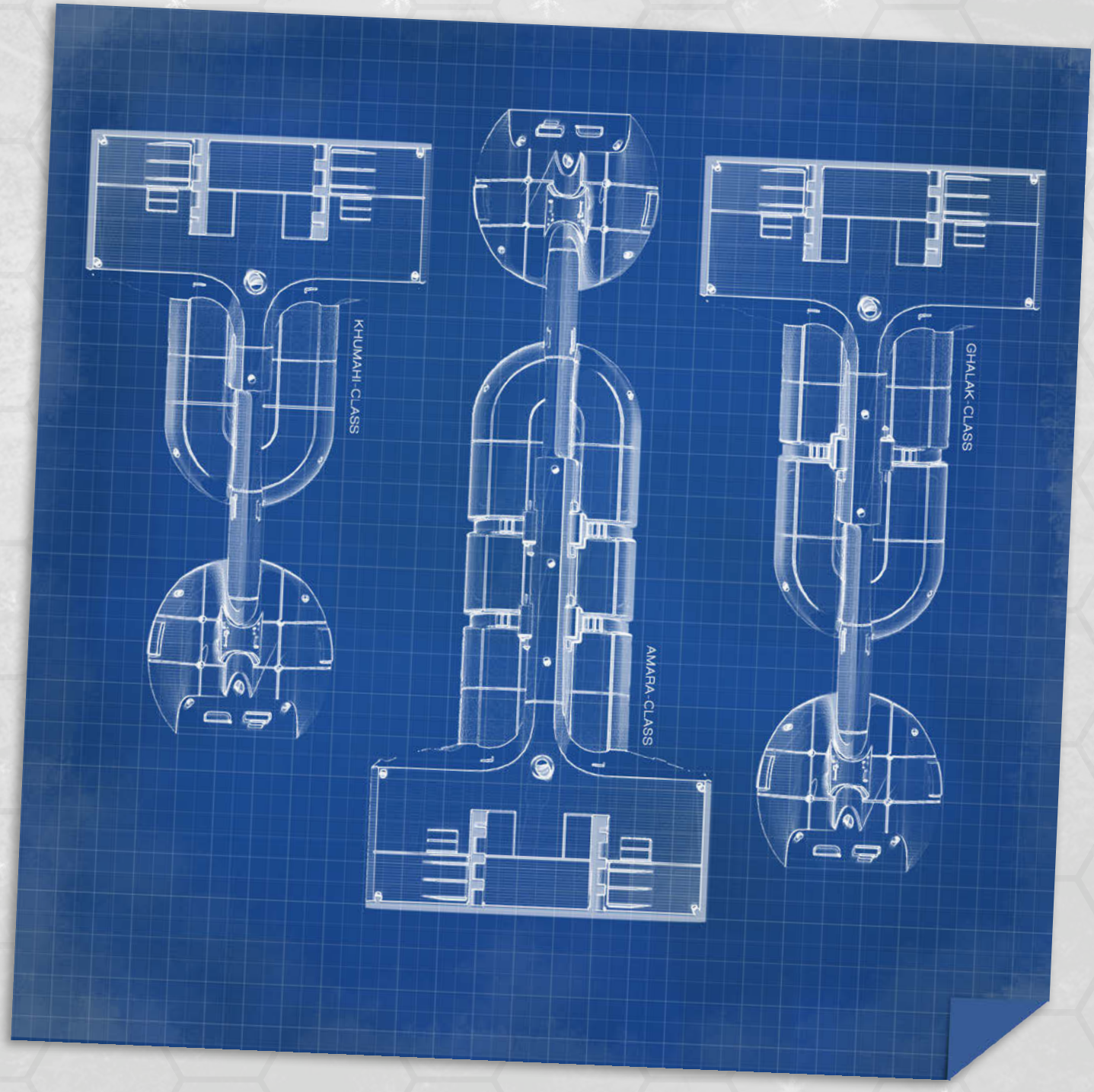
Using a heavy cruiser as a spy ship is, in some ways, a sledgehammer approach to intelligence operations but a vessel equipped with this pod is not merely an intelligence-gathering platform. Much of the raw data that comes in is from other sources – real spy ships disguised as normal free traders, operatives on long-term deployments and routine monitoring by electronic devices. The intelligence operations pod allows some direct data gathering to be undertaken – by electronic means as well as inducing local officials to talk at fancy parties hosted aboard the vessel – but its role is largely one of data collation and dissemination.

The pod has its own sensor array, granting DM+1 on checks to obtain information from an emission source, such as a city or ship, and to intercept and clean up transmissions that might otherwise be lost in background static.

The missile bays are fairly standard but many of the missiles carried are sensor probes or transportation 'buses', used to deploy satellites or deliver sensor packages. Probe operations are controlled from the pod's command chamber but in combat the missile bays would normally be tied into the fire control of other missile-equipped pods.

C H A P T E R - S I X

HULL CONSTRUCTION AND LAYOUT



All members of the Element cruiser family follow a similar layout. Indeed, the fore section is identical on almost all vessels, which can make visual identification of individual ships difficult. The obvious answer is to count the pods – six for an Amara, four for a Ghalalk and two for a Khumakirri. General attention to the ship's lines will also provide a clue; the lighter cruisers have a narrower and shorter spinal weapon column, with the Khumakirri having a noticeably smaller aft section than its larger relatives.

The main hull is constructed around a central spine, which houses the primary particle accelerator armament. All structural members are composed of AA-744 Bonded Superdense Composite with standard honeycomb configuration. Rigid structural members are constructed on a rod-and-tube model, with vacuum spaces to absorb deformation and reduce shock transmission. A hull skeleton with decks in place, but without armour, supports maximum manoeuvre with a 72% margin of safety. With armour and external hull plating in place, margin of safety meets or exceeds Navy Standard 8954 under all conditions.

Tests of the original vessel indicated a weak point in the central spine, displaying damaging levels of deformation when exceeding 3g forces under yaw-and-pitch conditions. No deformation was observed under maximum emergency thrust in a fore-and-aft direction, although safety margins for yaw-and-pitch were considered inadequate for combat manoeuvring. The addition of a reinforcing rib on the ventral side of the spinal mount proved inadequate under subsequent testing, requiring a triple-rib configuration along the ventral surface.

Spinal rigidity currently exceeds all required standards. An Amara-class cruiser cannot exert forces on its own structure exceeding 3.2g under yaw or pitch under its own power, and smaller vessels of the family have shorter spinal members and are therefore subject to lesser stresses. In theory, a direct hit on the central spine area with a kinetic weapon or large warhead might induce sufficient flexing to induce catastrophic structural failure if it coincided with a maximum-rate pitch-and-yaw manoeuvre. This possibility is considered vanishingly small but it is possible that the loss of INS Kireme in 1101 was due to such an occurrence.

Partial streamlining allows skimming of fuel from a gas giant or descent into the upper reaches of a planetary atmosphere. This capability is rarely used but the Amara-class has more than enough thrust to risk such a manoeuvre if circumstances merit it. One tactical use for this capability is to approach a target world 'hot' and use an aerobraking manoeuvre to decelerate sufficiently to remain in orbit without taking the spinal weapon off target. Whilst somewhat inefficient, this tactic causes significant shockwaves in the upper atmosphere and makes the cruiser extremely visible from the ground. As a 'broad hint' gambit, it has worked well in reducing the need to fire on ground targets during an intervention.

The primary hull consists of two main sections in addition to the spinal member.

Note: The three-rib reinforcing section is boxed in on all vessels as they receive it in a refit; new-build vessels integrate the reinforcing section in a less intrusive manner. Pre-1092 built *Amara*-class cruisers therefore have the so-called 'pipe box' under the spinal section. This can be accessed at various points in the main hull and is used for trunking auxiliary cables. The remaining space is usually subdivided with light partitions installed during routine maintenance, creating a crawlway with spaces that can be used for storage of items unlikely to be needed in a hurry. It is possible to proceed almost the entire length of the ship using the 'pipe box', although not quickly. This is not considered a serious security flaw as access can only be made from deep within the ship, however periodic inspections are recommended as the pipe box is a popular place for crew to store contraband.

Contraband: Mirage-liquor

FORWARD SECTION

The forward section contains flight operations systems and accommodation for flight crew, plus a small power plant that powers the point-defence and short-range weapon systems of this hull section in addition to controls, sensors and general systems. Overall, critical systems such as the bridge, power plant, sensor processing centres and fire control for the forward batteries are located more or less on the centreline, with other systems in surrounding spaces.

The main bridge, protected by armoured bulkheads, is located close to the front of the section, surrounded by the main sensor nodes and accommodation for junior members of the flight crew. The command bridge, intended to be used by a task force commander or commodore, is at the aft of this section. Between them lies officers' country, with suites for senior officers and accommodation for senior bridge crew plus briefing rooms, intelligence analysis stations and war rooms for senior and mid-level officers. A specialist galley serves these areas, with a small subdivided area for the preparation of meals for the captain or commodore.

Two power nodes containing small power plants and supporting machinery are located to the rear flanks of the forward section. These are surrounded by cabins for engineering and technical crew, living spaces and general stowage, plus a small fuel reserve.

In the forward part of each side of the section is a security node. This contains control chambers for the forward batteries and associated electronic systems as well as accommodation for the crews who operate them. Some of the ship's nuclear dampers and meson screens are also located in these areas, as well as a group of staterooms set aside for the use of marines assigned to the forward section along with a small armoury for shipboard weapons and damage control lockers.

Between the power and security sections on each side, the forward section also contains accommodation for members of the technical and general crew assigned to this part of the ship, along with mess facilities and general living spaces.

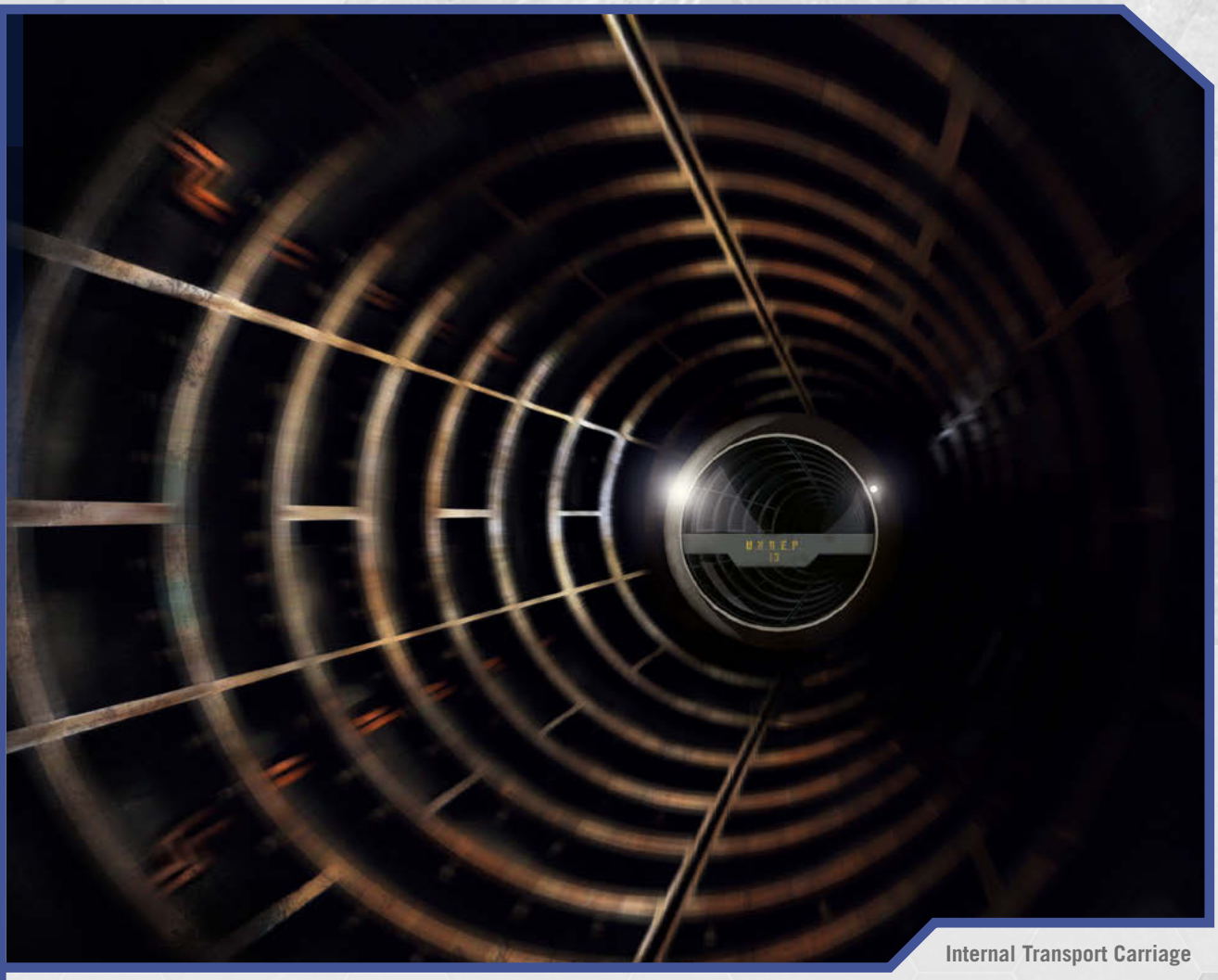
Officer's Briefing Room

SPINAL SECTION

The spinal section is built around the spinal weapon tunnel and its associated heavy structural bracing. Directly beneath the spinal tunnel on older ships is an area of low overhead clearance where the pipe box containing additional structural members runs. This intrudes into chambers right along its length, forcing some realignment of cabins and working areas. On newer ships the structural reinforcement is built into the spinal tunnel and the pipe box is not present.

Under and around the spinal tunnel is a utility area containing stowage space for spares as well as accommodation for gunnery personnel and some general crews. The roots of the attachment framework that supports the pod are interspersed with chambers containing an auxiliary power plant, some of the ship's screen generators and the primary gunnery control chamber. This part of the ship is the most structurally sound of the whole vessel, especially where the pod-roots meet the main spine.

The ship's main fuel tanks run the length of the spinal section, surrounding it and the decks beneath it. They are subdivided in places, with accommodation or structural members pushing through the tanks to the outer hull. The largest of these intrusions is the base segment of the so-called 'pod caps'. These provide a streamlined frontal cover for the ship's pods, enabling fuel skimming operations, and contain the marine barracks, armouries and hangars for the ship's utility craft. An Underway Replenishment (UNREP) System enables stores and supplies to be transferred through these sections without interfering in the normal operations of the vessel.



Internal Transport Carriage

AFT SECTION

The aft section contains the ship's main power plant, its drives and most of the working spaces. The main power plant is located deep in the heart of the aft section, partially surrounding the main firing chamber of the spinal particle accelerator. This gives a very short power transfer distance, reducing the chances of armament failure due to interruption of conduits or combat damage.

The jump drive is located directly aft of the main power plant, with the manoeuvre drive aft of that and distributed across the rear of the ship. Two smaller power plants are located to port and starboard. Accommodation for technical and engineering personnel surrounds the power plant and jump drive, with accommodation and working areas for general crew distributed along the port and starboard flanks.

The aft section also contains a secondary bridge, from where the ship can be commanded if necessary. Sometimes referred to as the 'engineering bridge', this chamber is often set up for optimised oversight of technical and engineering operations and used as a command post by the chief engineer. It is always manned by a flight or line officer – however junior – with a pilot on call just in case disaster disables the bridge and command crew.

At the fore corner of each flank is an accommodation complex for most of the ship's crew. Cargo space and general working areas are also dispersed along the flanks, along with specialist facilities such as workshops, sick bays and heavy maintenance equipment. Some of the ship's screen generators are also located in these areas.

Engine Room

COMMAND, CONTROL AND INTELLIGENCE

The cruiser is normally commanded from its main bridge, located in the forward section, and surrounded by sensor data and intelligence processing chambers. The command bridge, located aft of the main bridge, can be used to control the ship, although it is optimised for task force control operations. During operations without a flag officer aboard, the captain will normally run both his own ship and any escorts, support vessels or squadron mates he may have control over from his own bridge.

A support staff led by a junior officer will man the command bridge in case of emergency, using its facilities to conduct intelligence analysis or larger sensor tasks handed off from the main bridge. Thus whilst the main bridge is concerned with operating the ship at peak efficiency, the supporting staff in the command bridge may be conducting a long-range sensor sweep and analysis of distant parts of the system, overseeing small craft operations and liaising with local merchant traffic.

A command bridge can be used to fly the ship, although it is optimised for policy-making and fleet control operations rather than the details of running a cruiser. Controls must be reconfigured for ship operations, however most vessels have a configuration stored and ready to run in the ship's computer.

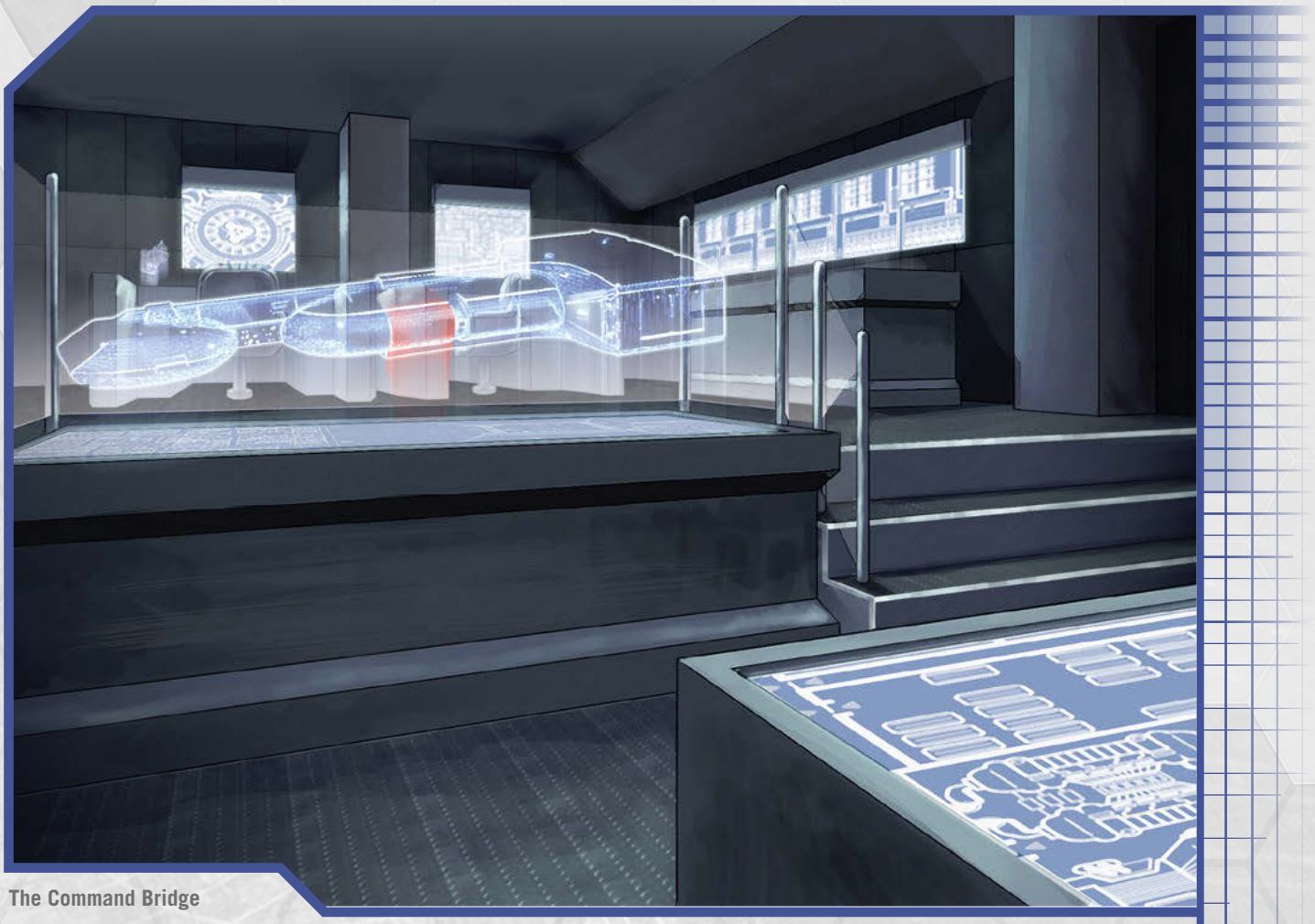
On many 'private' ships – that is, those with no flag officer aboard – the command bridge can become more or less permanently a routine-operations centre. It is vastly more comfortable and well-equipped than the small office used by the officer of the watch, so is often co-opted as his base of operations. There is nothing wrong with this practice, although the sudden arrival of a commodore might require removal of the support staff and any equipment they have installed in 'their' command bridge. Some captains will move to the command bridge upon receiving command of a task force, leaving the executive officer to take control of the ship. Most do not, however, unless they are involved in some highly complex operation.

There is a secondary control room in the engineering chambers, which is the action station of the ship's second-in-command. Usually this is the executive officer however, if the captain is running a squadron from the command bridge, and the XO is on the main bridge, it will be the next available non-specialist officer. Under routine conditions, the secondary control room is always manned by a Flight branch or non-specialist officer, just in case disaster strikes and the main control centre is put out of action. This officer has plenty of routine tasks to deal with, notably overseeing the running of the aft section whilst the officer of the watch handles the forward section and major issues affecting the ship as a whole.

All ships in the family have two primary computer systems. Both use a separate distributed architecture with nodes at critical points. The primary system has more of its nodes in the fore and spinal sections, the backup in the aft section, but both have components throughout the ship.

In the forward section the main computer nodes are located in two chambers on opposite sides of the section, equidistant from the spinal weapon tunnel and outer hull. Interference from particle weapon operations is not significant here, enabling these nodes to correct processing errors (known as 'gun glitches') caused by the proximity of minor local nodes to the accelerator's intense magnetic fields. Two more nodes are buried deep in the fuel tanks of the spinal section, accessed by a short tunnel. Four additional primary nodes are located in the aft section, with subsidiary processing equipment distributed throughout the hull.

The ship's computer can be accessed from any workstation aboard the ship, assuming the operator has the right clearance. There are computer rooms in the fore and aft sections, which have little processing equipment but are the duty stations of many of the ship's technical support personnel. By convention, most major programming tasks are handled in the computer rooms rather than at workstations, mainly as a matter of security and oversight. Attempting major reprogramming always needs special authorisation and doing so from any site but the computer rooms results in instant lockout, unless the captain and chief technical officer have both given permission.



The Command Bridge

The Amara-class makes use of its large hull area to distribute its sensor equipment. Loss of a critical detection or tracking system can 'mission kill' an otherwise undamaged warship, so it is standard practice to distribute sensor arrays as far as possible. The Amara-class has a standard military suite of sensors covering the whole electromagnetic spectrum, plus specialist instruments such as densitometers and gravitic distortion detectors, which serve mainly to warn of a ship jumping in or out nearby.

The ventral surface of the vessel is covered with interconnected passive sensor arrays. Others are present elsewhere but the increased concentration on the ventral surface gives greater resolution and earlier detection of faint traces. In combat, standard procedure is to bring the dorsal and forward surfaces of the ship to bear on the enemy, since this is where the main batteries are located. The relatively fragile arrays are therefore protected by the mass of the ship unless under close-range attack by agile craft.

Most sensors can operate in passive or active mode. In passive mode the system collects data but makes few or no emissions that can be detected. This allows vessels and other objects to be detected using reflected light, their own thermal emissions and any transmissions or sensor emissions they may make but cannot detect 'cold and quiet' objects such as an asteroid or coasting ship with good emission masking. Passive sensors operate all the time but when the cruiser is in 'listening watch' or 'silent running' mode they are all the vessel has to work with. This can be useful when trying to evade or ambush other vessels or when collecting intelligence before a strike.

In active mode, most sensors emit pulses that are reflected back from nearby objects. A vessel or object too small or 'quiet' to be detected with passive sensors will usually be picked up by active devices, however a vessel that runs active sensors advertises its presence over a greater distance than its own sensors can reach. Like most warships, the Amara-class has processing centres for its sensors that can identify many vessels by their drive signature and emission characteristics.

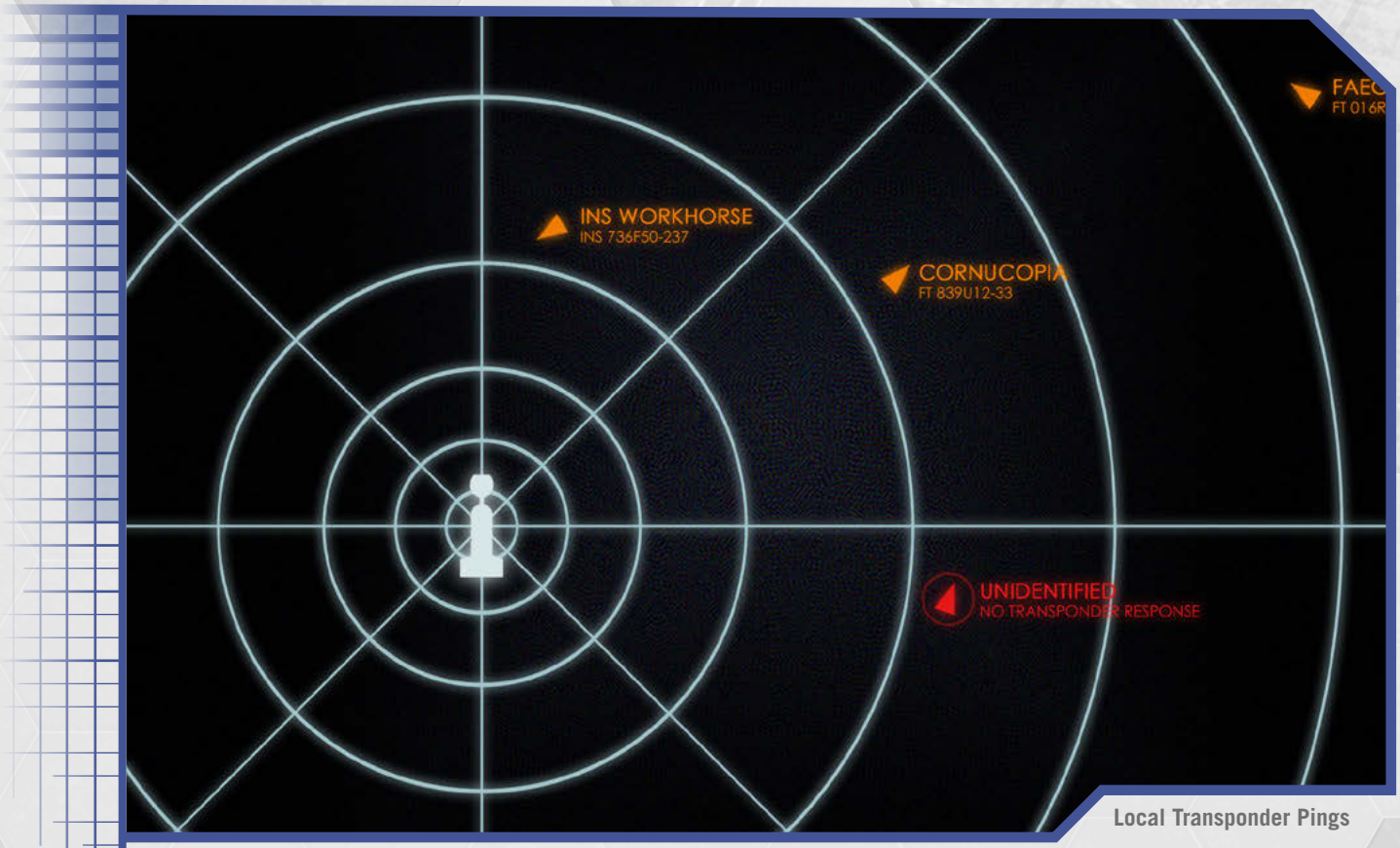
When active, most sensor groups operate in a track-while-scan mode, maintaining a constant all-round sweep but returning to known contacts every few seconds. It is possible to switch some systems to track a particular contact or refine data about it, whilst other sensor groups continue the all-round scan; the Amara-class has sufficient sensor redundancy to do this whilst specialist 'boresight' sensors focus on targeting data for the spinal weapon. Damage to the sensor system may take some groups out of action, requiring the sensors officer to make decisions about where to allocate sensor assets for best overall coverage or most refined data. Minor weapons that do only superficial surface damage can destroy sensor clusters, antennae and the like, effectively poking the ship's many eyes out one-by-one.

Under most circumstances, a cruiser will run with her transponder in 'overt' mode. That is, she constantly broadcasts her presence and actively 'pings' the transponders of all other ships in range. Depending on circumstances, the cruiser can fully identify herself with name, class and fleet or might just give her name. Sometimes transponder codes are altered to give the impression that more than one ship of the same type is operating in the area.

In peaceful areas, ships tend to run in overt mode but there is nothing sinister about a merchant ship that is not broadcasting her presence as she proceeds through a hazardous frontier system. However, transponders will normally respond to an active ping; a vessel whose transponder does not respond with her identity and basic data will attract immediate attention from a patrolling cruiser.

Naval ships operating under war-like conditions, or that are engaged in pirate hunting, might run with the transponder in 'IFF only' mode, or non-respond mode. IFF (Identification-Friend-or-Foe) mode only responds to pings from properly identified friendly naval vessels. A cruiser operating in IFF-only mode will identify herself by tight-beam communications to a patrol vessel that has pinged her but will not respond to a passing merchant ship. Sometimes naval ships sit just off the main spacelanes, their presence unsuspected until they light off their drives and go active on sensors. This is sometimes done for shock value, just to remind everyone the navy may be around even when they do not seem to be.

A ship with its transponder in non-respond mode will not identify itself to any ping unless specifically authorised by her captain. Some command ships have an override interrogative built into their transponder codes, which can force a response from friendlies, although this is rarely used. It can be employed to force a mutinous ship to identify herself and reveal her location but, on most occasions, a naval ship pinged by a friendly will respond in IFF mode at least.



Local Transponder Pings

DRIVES AND POWER SYSTEMS

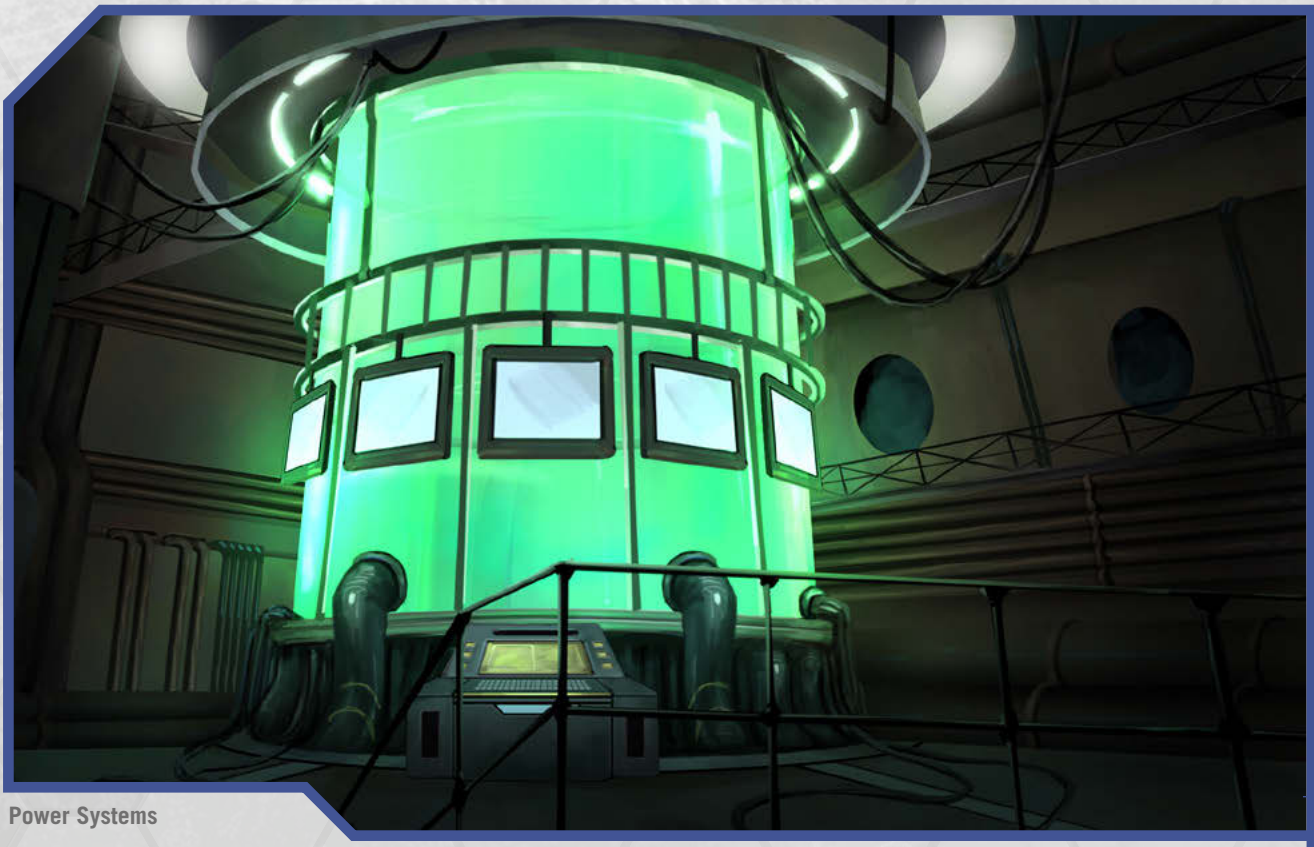
The heart of any starship is its power generation and distribution system. As with many larger warships the Amara-class uses a large main power plant and several smaller localised units, all feeding into a shipwide distribution system. In the event of serious damage, a section of the ship can be isolated and powered by its local plant.

The primary contractor for power generation equipment, aboard all Amara-class vessels, is Ling-Standard Products, although some equipment is locally produced to LSP patents. Control systems and operating protocols follow Imperial Navy standards of 1078 (revised) and are interoperable with all other navy vessels. No non-standard components are used.

Power distribution is semi-automated, using Imperial Navy Interface APA-664 for crew oversight. Under normal conditions the grid is set to auto-allocate with a priority to life support, manoeuvre drive, screens and point defences. Priorities can be adjusted or a custom power allocation model created by any authorised officer. Complete manual control is possible, although not recommended.

The jump drive used aboard early-build Amara-class cruisers was an LSP S4-75K, which proved entirely serviceable but was cumbersome to operate. Later vessels use the S4-75KA2, which implements streamlined operations with less personnel movement required during operations. Some vessels are instead fitted with locally available drive systems built to an equivalent standard.

Tactical mobility is provided by a General Products System-Sixtysix (sic) manoeuvre drive system, dispersed across the aft section of the vessel. Secondary lifter/manoeuvring units are positioned across the main hull, enabling precise low-thrust movements as well as rapid yaw, pitch and roll. Lifting capacity is sufficient that an Amara-class cruiser could hover above, or even land on, the surface of a body of up to 0.177g, however it has no landing legs and would likely suffer damage due to sagging on anything but completely flat ground. A low pass is sometimes useful over rockball worlds, either as a statement or to conceal the vessel from detection, and with a significant amount of lifting capability in hand the cruiser does not need to maintain orbital velocity whilst doing so.



Power Systems

WEAPONS

Like most warships, the Amara-class mounts its offensive, and some of its defensive weapons, in batteries, with a whole battery firing together at the same target. With the exception of the spinal mount, individual weapons are normally intended for point defence against missiles or small craft.

The original Ghalalk-class and smaller Khumakirri use an Instellarms-designed particle accelerator weapon officially designated Element/Spinal/Project CCSW27 but marketed and generally referred to as the Instellarms PA2700. This designation refers to the displacement tonnage of the weapon's firing chamber and collimation tube. Advanced miniaturisation allowed Instellarms to fit a nominally 3,500 ton weapon into a significantly smaller space without loss of firepower or impaired operability.

Primary armament on all non-refitted pre-1092 Amara-class cruisers is also an Instellarms-designed weapon. This is a scaled-up version of the PA2700 designated Element/Spinal/Project CCSW28 but more commonly known as the 'Big 2700'. It offers twice the firepower of the original weapon, prompting the Admiralty to set up a feasibility study regarding the implementation of this weapon on refitted Ghalalk-class armoured cruisers. This was found to be impracticable, although some radical rebuilds have been attempted to determine if a variant class might be created.

The Big 2700 has found a secondary market as a planetary defence weapon and was also used on both the Meshusdir-class heavy monitor and some orbital defence installations. About half of the weapons fitted to Amara-class cruisers are manufactured by Instellarms, with the remainder produced under license elsewhere. Post-1092, an Instellarms-designed meson gun was installed in some vessels of the class. Designated Element/Spinal/Project CCSW31, this weapon has not been made available on the general market and specifications are not widely available as it remains under Sensitive Technology restrictions.

Weapons are commanded from the gunnery direction chamber, located under the spinal weapon column in the centre of the ship, subject to authorisation from the bridge. The spinal weapon is targeted and fired from this chamber, whilst the fusion gun batteries each have their own direction room. Point-defence and beam laser turrets are guided from the fore and aft defensive weapons chambers, located in the forward and aft sections respectively. Control can be passed to other areas; a laser turret can be fired from any workstation provided the operator has authorisation. However, it is normal to operate weapons from their designated stations and any deviation from this will be flagged for response by an internal security detachment. All non-spinal weapons can be fired under local control by physically entering the turret or barbette and taking control of the weapon from there.

Spinal Weapon

ARMOUR AND DEFENSIVE SYSTEMS

The armour of an Amara-class cruiser and its pods uses bonded Superdense composite materials, supported by a heavy framework of supports, bulkheads and internal compartmentalisation. Armour is not a solid plate but consists of layers of superdense materials of differing composition and molecular alignment, interspersed with vacuum layers to reduce shock and energy transmission.

Whereas some ships use an all-or-nothing approach, concentrating armour over vital areas, the Amara-class has evenly spaced protection backed up by armoured bulkheads over critical spaces. This reflects the cruiser's intended role; it is expected to engage lesser combatants such as smaller cruisers or lighter warships, whilst sustaining as little damage as possible in the process.

The all-or-nothing model increases survivability in the event of heavy attack with spinal weapons but virtually ensures that some damage will be taken under almost any sort of attack, possibly necessitating a return to port after a fairly minor engagement. The armour distribution of the Amara-class is intended to allow it to smash up lighter combatants and continue with its mission, suiting it to the raiding or defensive role rather than slugging it out with its peers.

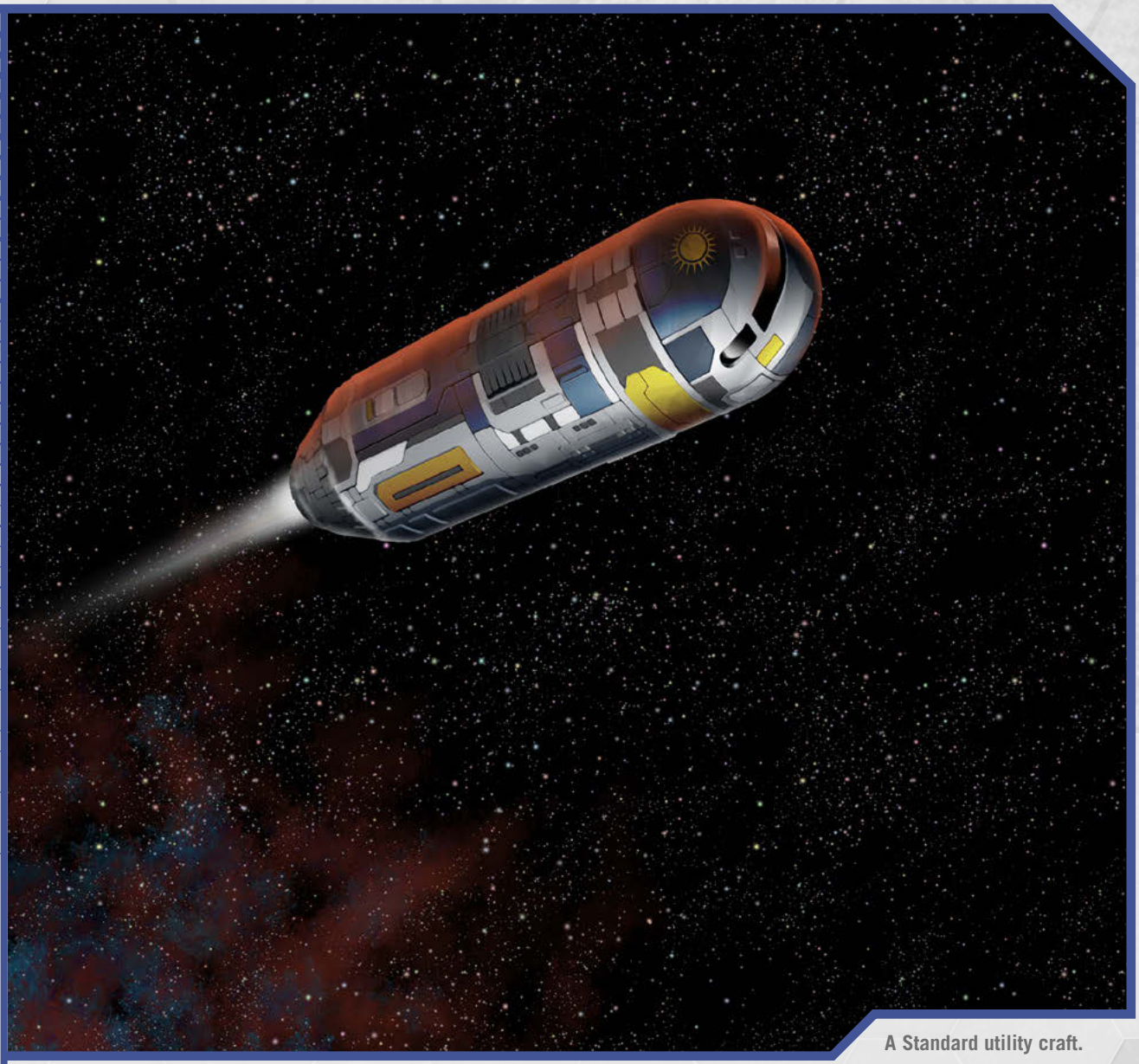
Of course, armour is the last-but-one line of defence – the last being skilled damage control parties – and no captain wants to rely on either of those. Manoeuvrability and the quick destruction of enemy vessels by heavy firepower – known as breaking the kill chain – help the Amara-class survive in combat. An extensive battery of sandcaster turrets is carried, distributed over the flank, dorsal and ventral surfaces of the ship, backed up by meson screens and nuclear dampers on all three main hull sections. Screen operations are subject to central direction from the gunnery control chamber but can be conducted locally if necessary.

Damage Control Team

SMALL CRAFT
AND CARGO OPERATIONS

All vessels of the Element family have docking facilities for twelve 20-ton utility craft. These craft can be specialist vessels if needed but are normally light personnel and equipment launches of standard design. They can be swapped for any combination of standard-configuration small craft to a maximum of 240 tons, although this may require reconfiguration of docking equipment.

Provisioning the ship would be an extremely lengthy business using the craft bays, so is rarely done. More commonly, a cruiser will use her UNREP system or permit a supply vessel to dock directly to the outer doors of the shuttle bay. Likewise, when at base, the docking bay acts as an entry point for visitors arriving by shuttle or from a vessel or station docked directly to the cruiser.



A Standard utility craft.

AMARA-CLASS
HEAVY ARMOURED CRUISER

The Amara-class heavy armoured cruiser is the largest vessel in the Element family, intended for the fleet heavy cruiser role, providing security for battle squadrons and protecting critical assets, such as battle riders or tanker squadrons. The Amara-class is recommended for deployment in standard four-ship squadrons alongside battle squadrons, leaving independent operations to smaller vessels.

GENERAL CAPABILITIES

The Amara-class meets Fleet Mobility standards for both tactical and strategic situations, being capable of 6g acceleration and one jump-4, enabling it to keep pace with other fleet assets. Its primary armament can inflict significant damage on a capital ship but its intended opponents are other cruisers and smaller vessels. In standard configuration, the Amara-class carries very significant missile and fusion gun armament, backed up by a close-in defence fit of laser turrets and point-defence clusters.

Secondary armament consists of fusion gun barbettes arranged in four batteries of four. Two batteries, designated A and B batteries, are located atop the dorsal surface of forward section, with X and Y batteries located on the dorsal surface of the aft section. All batteries can bear in a 180-degree arc above the plane of the ship's central axis.

Tertiary armament consists of thirty triple beam laser turrets on the main hull. Beam laser turrets are not grouped as batteries as such. They are located in clusters but fire independently at small craft threats or incoming missiles. These weapons are of negligible effectiveness against major warships but can provide close-in defence against threats moving too fast to engage with the fusion gun batteries.

One laser turret cluster is located on the front of the forward section, below the spinal weapon tunnel, and there are two on the underside of the forward section. Two more are located on the flanks of the aft section; one each side and one on its underside. This armament has been criticised as being rather light for a cruiser but is augmented by two point-defence systems, one on the forward section and one on the aft, and by turrets mounted on pods the ship is carrying.

VARIANTS

A number of variants on the standard Amara-class configuration have been developed. Some use a meson gun rather than particle accelerator as the spinal weapon system and this is becoming prevalent on post-1102 build vessels, with some older ships receiving a replacement in their mid-life refit. It was at one time predicted that all Amara-class cruisers would be converted to meson gun armament by 1114 but this is unlikely to happen given budget constraints.

CREW REQUIREMENTS

A large ship, such as a heavy cruiser, has a vast array of tasks that need to be carried out if it is to remain efficient or even operational. It can be operated at a very basic level by a skeleton crew but this leaves no margin for dealing with problems or conducting routine maintenance. An undermanned ship that is engaged in combat will not be able to cope with damage and may well not even be able to use its weapons effectively. However, it is possible to double up a lot of jobs in the short term, with engineers firing the ship's lasers from their workstations when not engaged with other tasks. This requires authorisation from whatever command staff are present, however a crew this short-handed will have to perform wonders of multi-tasking if they are to survive.

Most of the time, the crew includes a certain amount of redundancy. All crewmembers are familiar enough with basic shipboard tasks and emergency procedures that they can help out, even if lacking specialist skills. Cross-training is also common, ensuring that even if a department takes critical casualties some expertise in its field remains elsewhere in the crew. In less extreme cases, these cross-trained personnel can assist with expert tasks and gain additional experience.

Command and Administrative Personnel

An Amara-class cruiser's crew is subdivided into the usual branches, led by its captain and executive officer. The command and administrative personnel are non-specialists; officers belong to the Line and enlisted personnel to Crew branch.

Commanding Officer – Normally an officer of rank commander, sometimes a senior lieutenant-commander awaiting promotion or full captain leading a task force or squadron. The commanding officer is always addressed as the ship's 'captain', even if he does not hold that rank, and makes policy decisions implemented by his crew.

Executive Officer – Usually a lieutenant-commander from Line branch. The XO runs the ship for the captain, dealing with details while the captain makes policy based on the big picture.

Master-At-Arms – A senior enlisted crewmember with the rank of master chief petty officer, the master-at-arms is the only enlisted person aboard a cruiser with complete access to the entire ship. If the XO runs the ship, the master-at-arms leads the crew; these are the two most trusted positions aboard a vessel.

Logistics Officer – The role of logistics officer is held by a senior lieutenant on his way to becoming an XO. The logistics officer belongs to Line branch and is a 'fighting' officer in the chain of command, although he is often referred to as a 'combat accountant' with varying degrees of sympathy for the amount of paperwork involved.

Logistics and Administrative Staff – The logistics officer is assisted by around 20 junior officers and enlisted personnel (the number varies from ship-to-ship) including accountants, legal specialists and clerical staff. Specialists such as legal advisors are normally commissioned but, although they are technically 'line' officers whilst serving aboard a warship, they are not part of the chain of command unless the captain chooses to assign them additional duties. If they prove suitable, these officers are often used as spares to deal with odd jobs, advancing in Line positions. Those only capable of fulfilling their specialist role typically go to Staff after a tour aboard a warship. This department also contains any attached officers and personnel who are not part of the ship's crew, such as a diplomatic or legal team assisting with a particular mission.

Officer Cadets – Some ships carry a varying number of officer cadets and sometimes more senior officers undergoing a period of specialist training. These additional officers are made use of according to their skills, either leading small groups or assisting other officers. Some may be attached to the ship's specialist departments, while others are non-specialists in the Line.

Flight

Flight personnel operate the ship's bridge systems and pilot auxiliary craft. Flight is considered the most command-worthy of the specialist departments – there are more former astrogators commanding cruisers than any other specialism. The flight department is also very officer-heavy compared to other branches.

Senior Bridge Officer – The senior bridge officer heads the flight department and is often a qualified astrogator.

Astrogator – Arguably the most important specialist officer aboard the vessel, the astrogator is absolutely critical to operations and is kept very busy. He is assisted by a subordinate being trained into the role. No major warship ever leaves base with just one astrogator aboard and often there are several officers who can do the job among the senior crew.

Chief Pilot – Many smaller vessels have enlisted personnel as pilots but, aboard a cruiser, the role is given to an officer. There will always be a qualified pilot on the bridge or on call within moments when the ship is underway. In addition to assistant pilots, small craft pilots are often rotated through bridge watch to gain experience and relieve officers.

Flight Operations Officer – The flight operations officer oversees the maintenance and operations of the ship's craft and liaises with other vessels in the vicinity. In a complex traffic area, such as a major fleet, the flight operations officer is responsible for ensuring there are no close encounters with small craft.

Communications Officer – The comms officer is responsible for both routine communications and ensuring that a proper sensor watch is maintained. All bridge-qualified officers can do this but the comms officer is an expert and makes this his main responsibility. He is assisted by several operators who carry out routine tasks.

Engineering

The drives and power systems of a cruiser are manpower-intensive to operate. Engineering is also a highly skilled department requiring intelligent, educated enlisted personnel. Few engineering officers leave their department to become ship commanders; most progress to increasingly larger vessels or become the senior engineering officer in a squadron. Occasionally, this means the engineering officer of a 'senior' cruiser can outrank a new commanding officer. However, the ship's CO is always in charge and the engineering officer is merely the lord of his own domain. Engineers often progress to the Staff, becoming shipyard supervisors, repair and salvage experts or vessel designers rather than fighting captains.

Engineering Officers – From the chief engineering officer downward, all engineering officers are trained in at least the basics of power, jump and manoeuvre systems, and are specialists in one of them. Typically one of the Engineering Officers will lead each shift, with the Chief Engineer overseeing all three as necessary. Ideally a cruiser will have a very knowledgeable officer for each of the three sub-specialisms as a shift head, in which case each shift will be biased towards maintenance and calibration of one system.

Engineering Personnel – The ship's engineering personnel are highly skilled and can conduct routine operations without an officer overseeing them. Often the main power plant will be manned by an assistant engineering officer with the shift leader working on another project – such as recalibration of a cluster of drive nodes – as necessary. Another assistant engineering officer might be roving between the smaller power plants, acting as troubleshooter or conducting inspections. During this activity, most of the ship's engineering personnel will be going about tasks supervised by their petty officers. Aboard a well-run ship, most problems are solved before an officer even hears about them.

Chief Engineering Officer
Lieutenant-Commander

Engineering Officers x3
Lieutenant/Sublieutenant

Assistant Engineering Officers x12
Sublieutenant/Ensign

Engineering Personnel x175
Enlisted

Technical

On a smaller ship, the Technical branch is often combined with engineering and its personnel report to the chief engineering officer. Larger ships maintain a separate department under their own officers. Technical branch tends to have a low officer-to-enlisted ratio; most personnel are either computers/electronics specialists or electromechanical experts (referred to as 'soft' and 'hard' technicians respectively), with officers being highly skilled in their own specialism, such as cyber-security or fluid transfer systems.

Technical Officers are expected to be problem-solvers, able to turn their hand to any task from unjamming machinery or fabricating spares in the ship's workshops, to reprogramming robots or even the entire ship. Each has his own primary area of expertise, with leadership of a task often decided by competence rather than rank. Technical officers very rarely leave their department to become non-specialists and, eventually, command officers, although some transfer to the engineering or gunnery department.

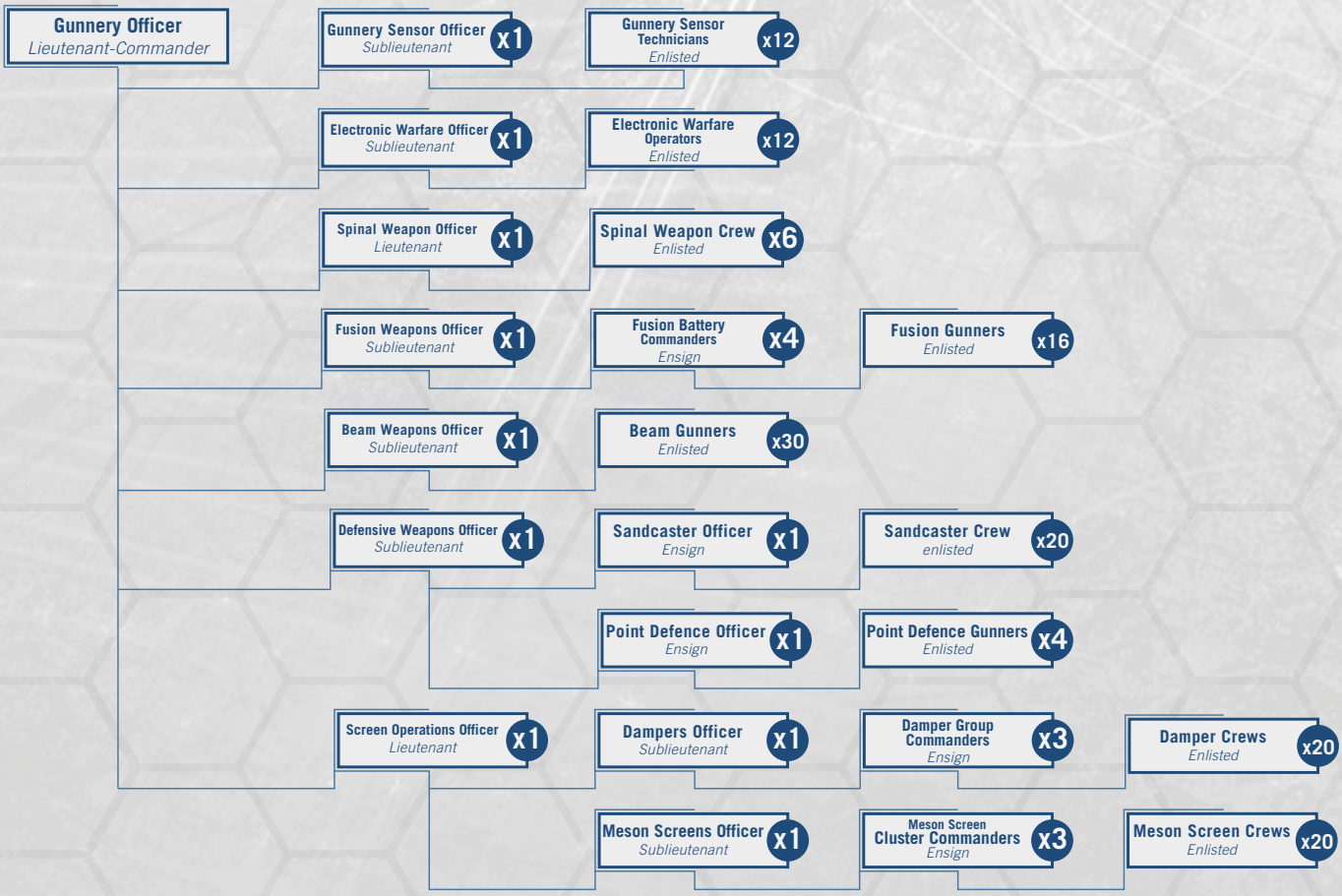
Technical Personnel range from programmers to pipe-bashers. Some are simply big, strong crewmembers who can pull on a crowbar harder than anyone else – there is a need for this even in a technologically advanced navy – whilst others have never broken a fingernail. Within the technical department sits the cyber-warfare subdepartment. It is not called that, instead using polite euphemisms such as 'electronics systems oversight' for its activities, but these personnel are often quietly employed to monitor local datanets wherever the ship goes and occasionally break into a target's security and cause mayhem. Once in a while, a naval action is won when one side simply switches off the other's weapons. Preventing this is a critical mission, although one downplayed by the navy.

Gunnery

The ship's weapons and defensive systems are operated by the gunnery crew, under the command of the gunnery officer and his subordinates. Gunnery is less prestigious than Flight department but serves as a route into Line and command positions for many cruiser captains.

Gunnery Officers are specialists in the operation and maintenance of their own systems, although always cross-trained in other weapons as well. As a gunnery officer becomes more senior he needs to see more of the big picture; a battery commander need only to optimise fire at targets he is given but the gunnery officer must prioritise targets according to multiple criteria in a rapidly-changing situation.

Gunnery Personnel are likewise specialists with a degree of cross-training. The commander of a multi-crew weapon is usually a petty officer (the spinal mount is an obvious exception) and referred to as gun-captain on occasion. Gunnery personnel are sufficiently skilled to assist with general maintenance when not looking after their own systems. Most are cross-trained on more than one weapon or defensive system.



Crew

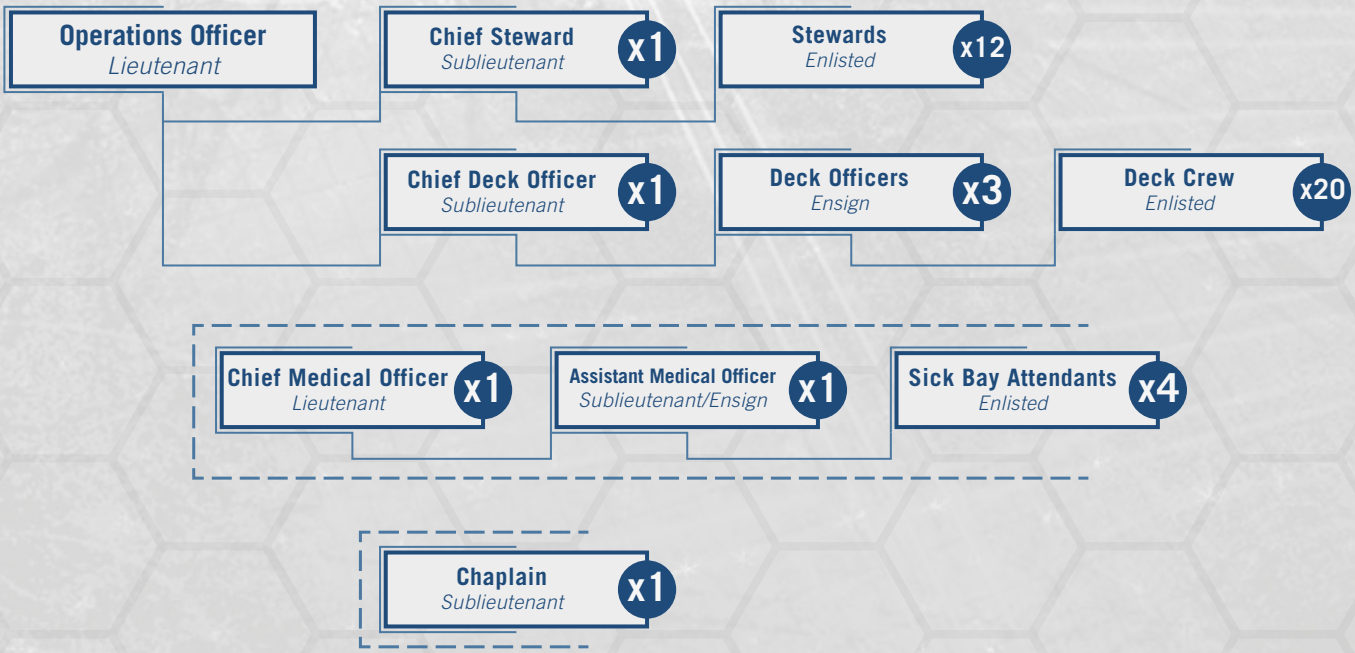
The Crew department is a catch-all for general-duties personnel and a range of specialists, without whom the ship or her crew could not function for long. The Crew branch is the most varied of the ship's departments, with several specialist areas all answering to the operations officer.

Operations Officer is responsible for general support operations that keep the crew fed and the ship working. Ops is a 'line' assignment and can be a stepping-stone to logistics officer and, eventually, command. It is a demanding and varied post, although often a thankless one.

Medical Officers and Personnel, and the Chaplain, are not part of the chain of command but specialists whose job is the physical and emotional well-being of the crew. Chaplains in the navy are secular, although individuals can belong to any faith so long as it does not interfere with their duties.

Stewards are responsible for feeding the crew and serving high-quality meals to the ship's officers. They are assisted by spare deck personnel, as well as a variety of appliances and robotic systems, but their role is still very much hands-on. Being a navy chef is a full-time occupation and one essential to the morale of the crew.

Deck Officers and Personnel are non-specialists who assist with a variety of tasks. In action, their role is shipboard security and damage control but the rest of the time they are assigned as needed to other departments. Deck officers belong to Line, sometimes progressing through the non-specialist route all the way to command. Others achieve the same goal after transferring to Flight, Gunnery or occasionally Engineering.



WATCHES AND DUTIES

Overall, an Amara-class cruiser carries 68 officers and 402 enlisted personnel at full complement, plus the crew of her pods and her marine complement. The ship's day is divided into three 8-hour watches, with an officer of the watch appointed for each. This officer deals with whatever minor matters arise during his stint, a duty that can be uneventful or chaotic. The officer of the watch is rotated through all officers of sublieutenant or higher rank, with the exception of command crew and the department heads.

During routine operations the bridge is always manned, sensor watch maintained and a pilot is at the helm or close by on call. Point defences are usually manned, except when in jump, but other weapon systems are not. Routine maintenance takes place on a constant basis, with larger programmes running over many days.

Major events like entering or exiting jump space or entering port, are overseen by the senior crew – department heads will be on duty along with the captain and XO during these periods. The rest of the time, exactly who is on duty depends on the captain's preferred roster. Some captains like to have a 'senior watch' or 'day watch' with all department heads on duty at once. Others prefer to have some on, some off at all times so at least one department has its 'A' team on duty if something unexpected happens.

There is no dedicated security contingent aboard an Amara-class cruiser but Deck personnel and marines are responsible for security. At any given time there will be armed security patrols moving around the ship and sensitive areas such as computer rooms and the captain's quarters will be carefully monitored from the officer of the watch's duty station. An armed party is always on call, with security stepped up when the ship is in port or otherwise accessible to outsiders.

MARINES

The Amara-class cruiser has barracks space for 225 personnel, equivalent to a reinforced company, but this is not always carried; a platoon of marines is normally carried as ship's troops, to undertake boardings and secure areas of the ship. Some marines are trained in operation of the ship's weapons and by tradition will join the gunnery crews and fight alongside them. Other marines will guard sensitive areas and assist with damage control. In extreme cases, the marine contingent can be used to enforce discipline.

A marine contingent will have its own officers, likely a single lieutenant for a platoon or captain for a company. By convention, a marine captain is addressed as 'force commander' when aboard to avoid confusion. Marine officers answer directly to the captain of their ship, through their own chain of command. They liaise with the master-at-arms and follow his lead even though he is an enlisted crewmember and marine officers hold a commission. This is a courtesy but also a working requirement as the master-at-arms is the direct representative of the host ship's captain.

When not engaged in their own activities, such as weapons maintenance or training, the marine contingent maintains security patrols and helps out aboard the ship. Relations between marines and crew can vary; aboard a happy ship both respect one another and get along well. However, sometimes marines are used by a captain to keep unruly crew in line, which sours relations whether or not these actions are merited.

Missile Pod Configuration

The standard configuration for an Amara-class cruiser ships features six 2,600 ton missile pods, armoured to the same standard as the main hull. A small power plant provides sufficient energy for most operations and is surrounded by accommodation for the weapon and power plant crews.

Each missile pod has twelve missile bays, located along its outer edge as well as the dorsal and ventral surfaces. Missile magazines are subdivided and situated such that each serves two or three bays rather than risking a single hit disabling the whole complement. Likewise, each bay has a fire control room but the missile armament of the entire pod is commanded from its gunnery control centre. This also directs the laser armament when it is not under central control.

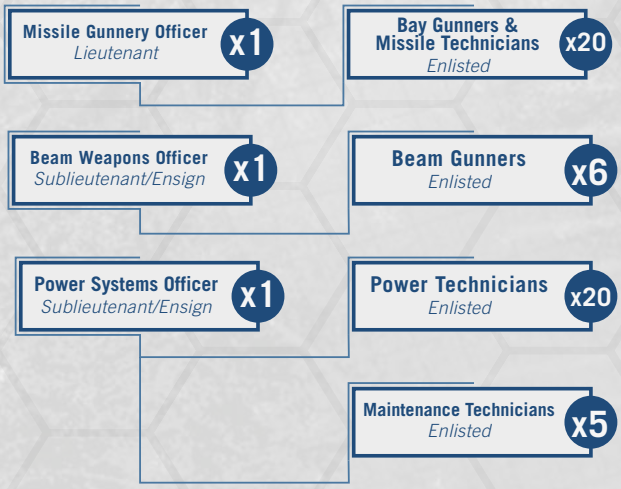
Each pod has two triple beam laser turrets on each of its outer, dorsal and ventral surfaces, contributing significantly to the ship's overall point defence capability. Control of these weapons is tied into the close-in defence net but local control is possible in the event of communications loss.

A standard missile pod has its own command structure, which slots into the cruiser's chain of command one of two ways. Some captains consider each pod a self-contained unit providing a particular service to the vessel as a whole. A missile pod essentially exists to launch missiles at whatever target the gunnery officer directs, so the solution is to let the pod's crew govern their own affairs other than when a command is received. However, this does not maximise the potential of the pod's systems and crew.

Ideally, pods and their crews are integrated into the overall command structure of the ship, so instead of considering each of the six missile pods as a separate department within his crew, a captain may choose to fully integrate all personnel and systems. This way, power technicians become part of the overall vessel's Engineering department and missile gunners become part of the Gunnery department. Removing the subdivision requires time and training but yields a more effective warship.

The internal command structure of a missile pod is as follows. As noted above, these personnel may be integrated into the ship's existing departments or kept as separate units.

If the pod is to be considered a self-contained unit, the senior officer assigned to it, or the officer commanding its primary function (in this case missile operations), is the pod commander and answers to the XO as do all other department heads. More commonly, the missile gunnery officer of each pod answers to the gunnery officer, beam weapons officers join the beam weapons sub-department and the power systems staff become part of the engineering crew. In this case, personnel might continue to be berthed in their 'home' pod but could have a duty station elsewhere in the ship. Amara-class cruisers are not designed to swap pods quickly – most have the same loadout for their entire career and are considered a whole ship rather than a core-and-pods configuration.



SECURITY AND OPERATIONS

When anyone comes aboard any Imperial Navy warship they are scanned into the ship's data systems and assigned a status. The formal reporting-aboard carried out by all personnel automatically informs the ship's computer of their arrival and confirms their status. A crewmember who has not reported aboard or one who is relieved of duty for medical or disciplinary reasons, is flagged by the system as invalid. Depending on what they try to do, they may be passively tracked by the ship's computer or a security detachment can be dispatched to apprehend and question them.

To be valid, someone must have formally reported aboard to the officer of the watch or his appointed deputy. This is often done remotely if the crew are in a hurry but tradition requires that officers report to the officer of the watch or captain, either at their office or in the docking bay if a welcoming party is in place. Enlisted men report to a junior officer or senior petty officer, who will be physically present in the docking bay. The act of reporting to a live person is not truly necessary for security purposes but is considered to be a positive factor in maintaining the cohesion of a ship's company.

Upon reporting, or being formally returned to duty, a crewmember or visitor gains access to the ship's systems according to their rank, duties aboard ship and any special considerations applied by the ship's officers. Amara-class cruisers use a standard Imperial Navy devolution and authorisation package. Very few, if any, areas of the ship or her operations are unsecured under any circumstances. Non-essential areas and systems normally operate on an 'any crew' basis, meaning that any member of the ship's complement recognised by the ship's computer as valid can operate systems in that area without setting off security alarms.

The levels of authorisation in force are:

Unsecured – No security is in place and anyone may operate the system or be in the area without attracting the ship's security monitoring systems. Normally there are no unsecured areas aboard a warship, although some crews will alter the settings for the sake of convenience and it is not inconceivable that an Unsecured 'hole' could be made in a ship's monitoring system by a suitably skilled programmer.

Any Valid – Anyone recognised as valid may enter these areas and use these systems, and will not attract security protocols. Normally Any Valid is reserved for guest quarters, mess areas and other locations where there is little a visitor can do to cause harm.

Any Crew – Any member of the crew recognised as valid may use these systems or enter these areas. Living spaces, common areas and briefing rooms are typically set to Any Crew, along with most routine operations of the ship's internal systems. Potentially sensitive areas such as weapon turrets are normally set to Any Crew regarding personnel being in the area but Any Gunnery for operations. Thus a crewmember mopping the floor will not attract a security patrol but if he suddenly decides to fire the ship's weapons he will not be able to operate them and will soon find a patrol in attendance.

Any (Department) – Any member of the relevant department may operate these systems. Some systems require special authorisation whether or not a valid crewmember is trying to use them; for example, the ship's weapons are controlled by the command team. If the weaponry is set to 'tight' then it cannot be fired no matter who is pounding on the buttons. Likewise, whilst any crewmember can go into the galley to make a sandwich, attempting access to the 'captain's kitchen' annex will attract attention unless the user has been designated as one of the senior officers' stewards.

Any (Rank or Duty) – some systems are accessible only to personnel of a certain rank. For example, whilst any crewmember can break out firefighting equipment, it normally requires a petty officer to grant access to emergency cutting gear. Some designated damage-control personnel are assigned special authorisation as a result of their membership of a damage-control team.

(Department) (Rank or Duty) – Some systems are accessible only to members of a particular department who also hold a certain rank or above, or to members of a particular team. Thus, missile magazines and handling hoists might be accessible to any member of the gunnery team but the nuclear warhead storage area is only accessible to missile technicians and gunnery department officers.

(Specific) – Some posts aboard ship have specific access to systems that other crewmembers do not. The captain and executive officer have blanket access to more or less everything – a commodore or diplomat's private computer systems are the only likely exceptions under normal operating circumstances – and other posts have specific access to certain systems. Sometimes this is dependent upon duty; for example, a quite junior officer might be serving as officer of the watch or senior bridge officer, and during this period he will have access to systems normally above his clearance. A sublieutenant would not normally be authorised to declare the ship's

weapons free but if he is the senior officer on bridge watch when a raider comes out of jump he needs the ability to do so without waiting for authorisation.

Department heads and their deputies have override access to most areas within their department's remit and can usually authorise others to handle a task. The ship's computer is set to recognise a valid order and assume authorisation. Thus, if the damage control officer orders someone to break out a piece of restricted equipment, the computer recognises this as authorisation. This function can be disabled, requiring formal authorisation to be granted to specific individuals but this is more time-consuming and would normally be done only if the ship is operating under very secure conditions such as when infiltration is suspected.

Under normal conditions, this system ensures that crewmembers can go about their duties without needing constant authorisation or setting off alarms but anyone who does something he would not normally be expected to do (such as a chef trying to enter a deployment shuttle in the docking bay) will be locked out and security staff notified. Orders given by someone who can authorise such tasks will remove this prohibition. However, there are workarounds used by most crews that slightly undermine the system. For example, the captain's steward may have access to the flight bay on a permanent basis, so he can bring special packages of luxury food directly to the galley. This is not normally a problem but can lead to a supposedly secure system becoming full of little holes, created by special permissions.

In the event that a ship suffers the catastrophic loss of its command staff, there may be no-one aboard who can authorise the use of critical systems. This is clearly not acceptable, so all Imperial Navy ships operate a 'top ten' system, which tracks the ten most senior members of the chain of command at all times. If three of these ten personnel agree on a nominee as acting commanding officer, then command devolves to that individual and they can assign posts as desired from that point on.

Under more normal circumstances, the devolution of command follows a clearly defined path and the ship's computer simply informs the appointed person that they are now in command of the ship. An individual may decline, in which case the computer moves to the next most senior member of the crew. Declining emergency command is a difficult decision but a badly damaged vessel might be better off with her experienced chief engineer at his post rather than trying to run the whole ship, even if this means placing a 20-year-old sublieutenant in temporary command.

Protocol requires that a decision to decline command be reviewed every few hours. Once the immediate crisis is over, the senior officer is expected to take command if at all possible but the system recognises that there is sometimes not time for an officer to make his way to the bridge through a ship that is in the middle of a desperate fight.

Shipboard security and command systems depend heavily on the ship's computer but can still function if it is disabled. All crewmembers carry a personal identity card, which is automatically updated with their valid status when they come aboard a ship. Doors, systems and workstations all have readers for crewmembers' keycards and can recognise an authorised person even if the computer is down. Updating status with authorisation and permission is difficult under such circumstances, however there are few occasions under which a ship might have to function without her computer system and all its backups.

Some command decisions, notably freeing weapons to fire and initiating jump, require multiple authorisations. For weapons fire, the captain must authorise 'weapons free' and the gunnery officer must authorise a given battery to fire – and both must be valid at the time the order is given. Command override applies under such circumstances. For example, the executive officer is assumed to speak for the captain at all times unless specifically countermanded, so can directly order a battery to open fire. This is a breach of protocol if the gunnery officer is in place and functioning but a bypass is permitted, if necessary.

Ultimately, all authority aboard a ship devolves from its captain and runs down the chain of command. If the captain chooses to remove someone from the chain of command or rescind their authorisation to carry out specific tasks then this is his prerogative. However, under most circumstances a legal order is assumed to carry the full weight of the captain's authority, so if the gunnery officer tells the sublieutenant in charge of point defence to open fire and he orders the crewmembers manning the system to do so, this order does not need to be confirmed by the captain. Under normal operating conditions a ship's point defences are considered 'free' on the authority of the gunnery officer or senior gunnery department officer on duty, whilst offensive systems need authorisation from the bridge before they can be brought into action.

C H A P T E R - E I G H T

GHALALK-CLASS ARMOURED CRUISER

The Ghalalk-class armoured cruiser was the original design of the Element family, intended for fleet operations. It is today more commonly encountered in other applications, often acting as a solo patrol vessel or as a fleet scout. The Ghalalk-class is administratively deployed in four-ship squadrons but these are routinely broken into two-ship divisions or single vessels. As a result, these ships rarely have a commodore aboard and often reconfigure their command bridge for internal operations.

Any given vessel of the Ghalalk-class is more likely to have been given a custom pod fit than an Amara. Thus, although nominally equipped with four missile pods, many Ghalalks have one or more other pods. One that has seen recent service as an intervention unit might be carrying additional marines; one assigned to interdiction operations could have one or more hangar modules in place of its missile fit.

GENERAL CAPABILITIES

The Ghalalk-class meets Fleet Mobility standards for both tactical and strategic situations, being capable of 6g acceleration and one jump-4, enabling it to keep pace with other fleet assets. Its primary armament is sufficient to cause severe damage to a light cruiser or lighter vessel but is not considered powerful enough to engage capital ships with any chance of success.

Secondary armament consists of fusion gun barbettes arranged in four batteries of three. Two batteries, designated A and B batteries, are located atop the dorsal surface of forward section, with X and Y batteries located on the dorsal surface of the aft section. All batteries can bear in a 180-degree arc above the plane of the ship's central axis.

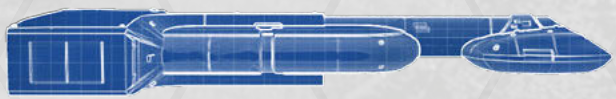
Tertiary armament consists of twenty triple beam laser turrets on the main hull. Beam laser turrets are located much as on the Amara-class, in clusters optimised for close-in defence.

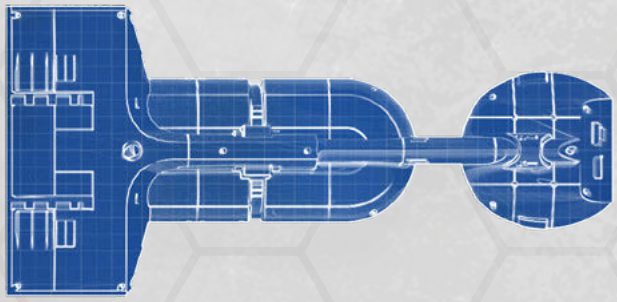
VARIANTS

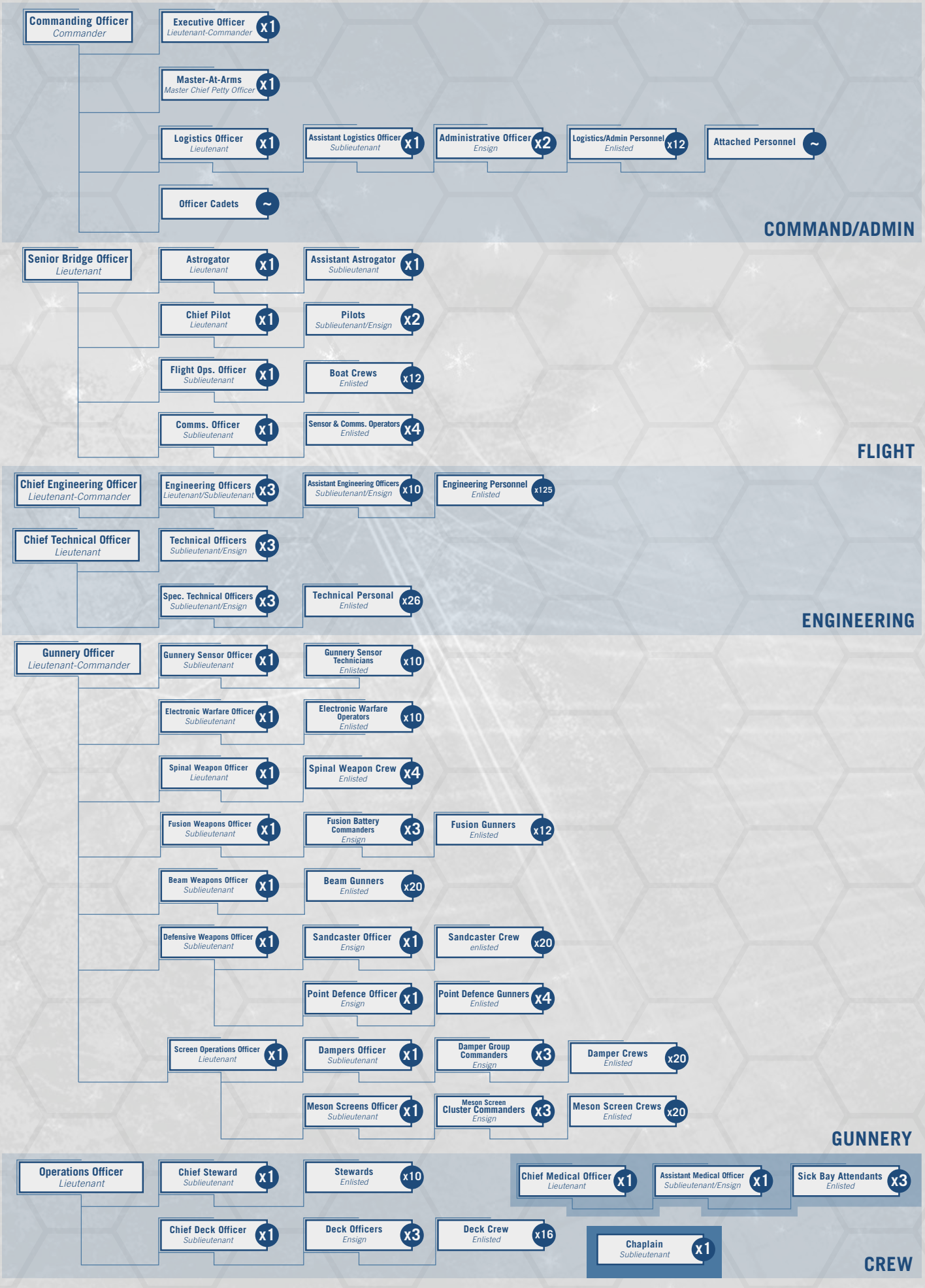
As with other vessels in the family, a considerable amount of variation and mission-tailoring is possible altering the pod fit carried by a given Ghalalk-class cruiser. Most vessels assigned to normal fleet operations carry either four missile pods or three plus one pod tailored to a specialist role. A commonest standard-variant Ghalalk is the Heavy Interdiction Vessel configuration, carrying two hangar pods, a marine pod and an orbital assault pod. This vessel is designed to spend long periods orbiting an interdicted or sanctioned world, using its small craft to spread a wide net to prevent smuggling or illicit visits to the surface. The marine contingent typically conducts boarding or seizures of suspect vessels but might also be called upon to intervene groundside.

CREW REQUIREMENTS

The Ghalalk-class requires a smaller crew than the Amara but in most ways the distribution of personnel is similar. Tasks and responsibilities are the same as aboard other members of the family.






Commanding Officer
Commander
Executive Officer
Lieutenant-Commander
x1
Master-At-Arms
Master Chief Petty Officer
x1
Logistics Officer
Lieutenant
x1
Assistant Logistics Officer
Sublieutenant
x1
Administrative Officer
Ensign
x2
Logistics/Admin Personnel
Enlisted
x12
Attached Personnel
~
Officer Cadets
~
COMMAND/ADMIN
Senior Bridge Officer
Lieutenant
Astrogator
Lieutenant
x1
Assistant Astrogator
Sublieutenant
x1
Chief Pilot
Lieutenant
x1
Pilots
Sublieutenant/Ensign
x2
Flight Ops. Officer
Sublieutenant
x1
Boat Crews
Enlisted
x12
Comms. Officer
Sublieutenant
x1
Sensor & Comms. Operators
Enlisted
x4
FLIGHT
Chief Engineering Officer
Lieutenant-Commander
Engineering Officers
Lieutenant/Sublieutenant
x3
Assistant Engineering Officers
Sublieutenant/Ensign
x10
Engineering Personnel
Enlisted
x125
Chief Technical Officer
Lieutenant
Technical Officers
Sublieutenant/Ensign
x3
Spec. Technical Officers
Sublieutenant/Ensign
x3
Technical Personal
Enlisted
x26
ENGINEERING
Gunnery Officer
Lieutenant-Commander
Gunnery Sensor Officer
Sublieutenant
x1
Gunnery Sensor Technicians
Enlisted
x10
Electronic Warfare Officer
Sublieutenant
x1
Electronic Warfare Operators
Enlisted
x10
Spinal Weapon Officer
Lieutenant
x1
Spinal Weapon Crew
Enlisted
x4
Fusion Weapons Officer
Sublieutenant
x1
Fusion Battery Commanders
Ensign
x3
Fusion Gunners
Enlisted
x12
Beam Weapons Officer
Sublieutenant
x1
Beam Gunners
Enlisted
x20
Defensive Weapons Officer
Sublieutenant
x1
Sandcaster Officer
Ensign
x1
Sandcaster Crew
enlisted
x20
Point Defence Officer
Ensign
x1
Point Defence Gunners
Enlisted
x4
Screen Operations Officer
Lieutenant
x1
Dampers Officer
Sublieutenant
x1
Damper Group Commanders
Ensign
x3
Damper Crews
Enlisted
x20
Meson Screens Officer
Sublieutenant
x1
Meson Screen Cluster Commanders
Ensign
x3
Meson Screen Crews
Enlisted
x20
GUNNERY
Operations Officer
Lieutenant
Chief Steward
Sublieutenant
x1
Stewards
Enlisted
x10
Chief Deck Officer
Sublieutenant
x1
Deck Officers
Ensign
x3
Deck Crew
Enlisted
x16
Chief Medical Officer
Lieutenant
x1
Assistant Medical Officer
Sublieutenant/Ensign
x1
Sick Bay Attendants
Enlisted
x3
Chaplain
Sublieutenant
x1
CREW

C H A P T E R - N I N E

KHUMAKIRRI-CLASS LIGHT ARMOURED CRUISER

The Khumakirri-class light cruiser was designed as a scaled-down Ghalalk, retaining its primary and secondary armament. This required some compromises, notably in terms of fuel capacity. The Khumakirri-class can only make jump-2 using internal tankage, requiring both its pods to be configured as fuel tanks if it is to retain standard fleet mobility. This is not too much of a drawback, as it has created a light cruiser with very potent main-gun firepower at the expense only of missile capability.

The Khumakirri-class can be encountered solo on patrol or as the centrepiece of a small task force. It is commonly assigned as an escort for tanker squadrons or large carriers, battle tenders and similar vessels. As with the Ghalalk, it is uncommon to encounter a Khumakirri with a flag officer aboard.

GENERAL CAPABILITIES

In standard configuration the Khumakirri-class meets Fleet Mobility standards for both tactical and strategic situations, being capable of 6g acceleration and one jump-4, enabling it to keep pace with other fleet assets. Its primary armament is powerful for its size being identical to the main weapon of the much larger Ghalalk class heavy cruiser.

Secondary armament consists of fusion gun barbettes arranged in four batteries of three. Two batteries, designated A and B batteries, are located atop the dorsal surface of forward section, with X and Y batteries located on the dorsal surface of the aft section. All batteries can bear in a 180-degree arc above the plane of the ship's central axis.

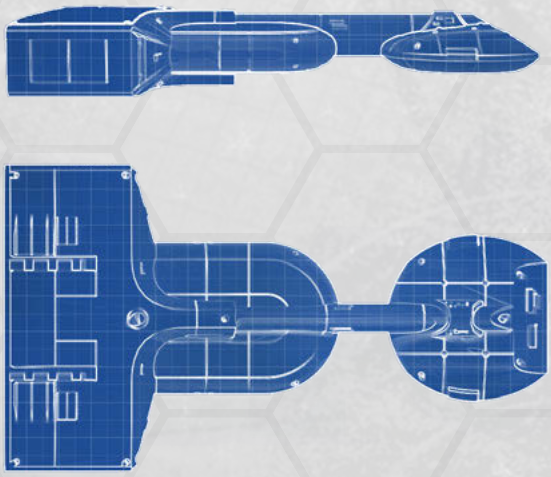
Tertiary armament consists of fifteen triple beam laser turrets on the main hull. Beam laser turrets are located much as on the Amara-class, in clusters optimised for close-in defence.

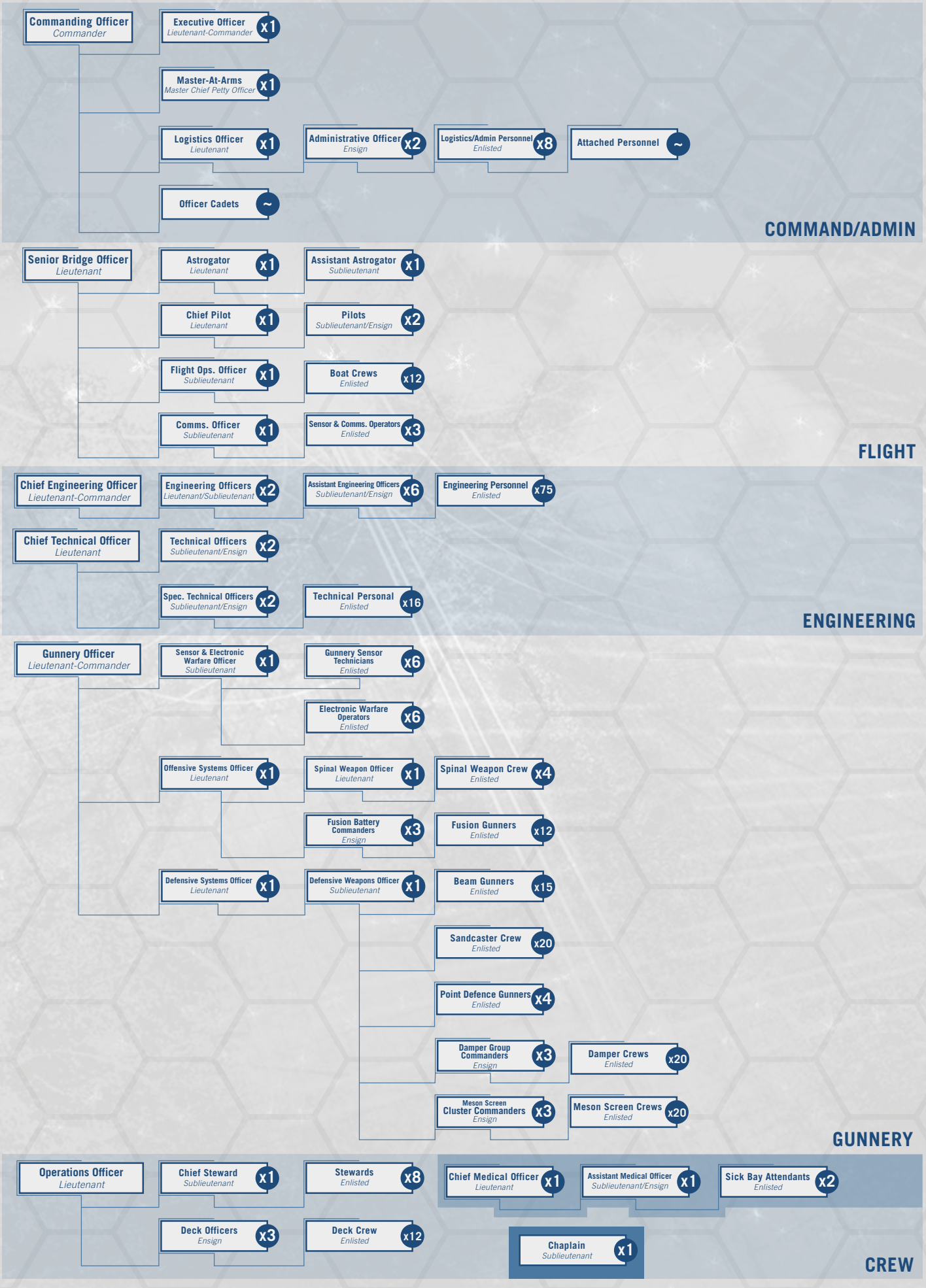
VARIANTS

A low-jump version of the Khumakirri is a popular choice with planetary navies, who fit weapons pods rather than the fuel tanks of Imperial vessels. Jump-2 is entirely satisfactory for short range missions and local patrols and the addition of a pair of missile pods creates a very potent warship for its size. Other variants ship a heavy torpedo armament or use custom pods containing a mix of fuel and systems tailored to the specific requirements of the user.

CREW REQUIREMENTS

The Khumakirri-class has similar division of the crew to its larger cousins but groups subdepartments differently to avoid requiring a very officer-heavy complement to control its many systems.




Commanding Officer
Commander
Executive Officer
Lieutenant-Commander
x1
Master-At-Arms
Master Chief Petty Officer
x1
Logistics Officer
Lieutenant
x1
Administrative Officer
Ensign
x2
Logistics/Admin Personnel
Enlisted
x8
Attached Personnel
~
Officer Cadets
~
COMMAND/ADMIN
Senior Bridge Officer
Lieutenant
Astrogator
Lieutenant
x1
Assistant Astrogator
Sublieutenant
x1
Chief Pilot
Lieutenant
x1
Pilots
Sublieutenant/Ensign
x2
Flight Ops. Officer
Sublieutenant
x1
Boat Crews
Enlisted
x12
Comms. Officer
Sublieutenant
x1
Sensor & Comms. Operators
Enlisted
x3
FLIGHT
Chief Engineering Officer
Lieutenant-Commander
Engineering Officers
Lieutenant/Sublieutenant
x2
Assistant Engineering Officers
Sublieutenant/Ensign
x6
Engineering Personnel
Enlisted
x75
Chief Technical Officer
Lieutenant
Technical Officers
Sublieutenant/Ensign
x2
Spec. Technical Officers
Sublieutenant/Ensign
x2
Technical Personal
Enlisted
x16
ENGINEERING
Gunnery Officer
Lieutenant-Commander
Sensor & Electronic Warfare Officer
Sublieutenant
x1
Gunnery Sensor Technicians
Enlisted
x6
Electronic Warfare Operators
Enlisted
x6
Offensive Systems Officer
Lieutenant
x1
Spinal Weapon Officer
Lieutenant
x1
Spinal Weapon Crew
Enlisted
x4
Fusion Battery Commanders
Ensign
x3
Fusion Gunners
Enlisted
x12
Defensive Systems Officer
Lieutenant
x1
Defensive Weapons Officer
Sublieutenant
x1
Beam Gunners
Enlisted
x15
Sandcaster Crew
Enlisted
x20
Point Defence Gunners
Enlisted
x4
Damper Group Commanders
Ensign
x3
Damper Crews
Enlisted
x20
Meson Screen Cluster Commanders
Ensign
x3
Meson Screen Crews
Enlisted
x20
GUNNERY
Operations Officer
Lieutenant
Chief Steward
Sublieutenant
x1
Stewards
Enlisted
x8
Deck Officers
Ensign
x3
Deck Crew
Enlisted
x12
Chief Medical Officer
Lieutenant
x1
Assistant Medical Officer
Sublieutenant/Ensign
x1
Sick Bay Attendants
Enlisted
x2
Chaplain
Sublieutenant
x1
CREW

C H A P T E R - T E N

HISTORY

The Amara-class entered series production in 1071, with the first units reaching the fleet in 1073. This was a small batch, restricted to Core sector, for development and evaluation purposes. Trials were favourable and the design went into high-volume production in 1075.

It was initially intended to provide each sector fleet with one squadron of four Amara-class cruisers by 1080, with two additional squadrons becoming available over the course of the next decade. Production actually exceeded this target, allowing several vessels to be co-opted into other roles or used for additional development of the class.

Concerns about structural integrity began to surface in the 1080s, with engineering crews reporting unusually high stress levels in the primary spinal members during fast lateral or vertical slewing manoeuvres. Although this did not require an immediate recall to port, a series of experiments indicated that strengthening was required. Initial measures proved ineffective but by 1088 a standard modification was in place to be implemented at each vessel's next major refit. New-build vessels received a 'tidied up' version of this structural modification from 1092 onwards.

A few ships have never received the structural improvement; mostly those transferred to client states or planetary navies early in the career of the class. Some local alterations have been made, often in a fairly crude manner, but most of these ships remain as built. The possible structural weakness is not considered serious under most circumstances.

The Amara-class saw its combat debut in 1079, when INS Dusagara came under attack during a routine flag-showing patrol in the Outreaumer subsector of Ley sector. The incident was a deliberate ambush, incorporating a saturation torpedo attack launched by the freighter Outworld Conveyor, which had recently been captured by pirates. Her point defences swamped by the heavy torpedo salvo, INS Dusagara suffered severe damage to all sections but notably lost her bridge and senior flight crew.

Initially fighting under the command of a junior officer in the secondary command centre, INS Dusagara disabled the freighter and successfully defended herself against attack by additional light torpedo craft and a destroyer thought to be of Solomani origin. Despite the disablement of her main drive at the critical stage of the battle and the total loss of her spinal mount, INS Dusagara fended off torpedo attacks long enough to restore manoeuvre capability and chased down the fleeing destroyer. A salvo of fusion gun fire at close range saw the attacker totally destroyed. The freighter was subsequently captured.

Lieutenant-commander Janise Evnaanii, gunnery officer aboard INS Dusagara and commanding officer after the first minutes of the fight, later faced criticism for her decision to restore power and chase the hostile, rather than giving priority to saving lives among her crew. Her response was to state that 'those ships were trying to take us out so the local spacelanes would be defenceless against whatever they did next. We had a responsibility to prevent that. Besides… ambush an Imperial Navy cruiser and get away with it? No.'

The Court of Inquiry agreed with the sentiments expressed and presented evidence that the attack was a precursor to a major insurrection against the Imperium in Ley Sector. Additional fleet elements were deployed and diplomatic teams were able to undermine popular support for the revolt. No Solomani Confederation involvement was proven; it may be that the destroyer was obtained through nefarious means or was a surplus vessel sold off and ultimately obtained by rebels.

During the Fourth Frontier War of 1082-84, a force of Amara-class cruisers were available to the Spinward Marches and Deneb fleets. The Spinward Marches contingent was employed in accordance with the doctrine of the time, accompanying battle squadrons to provide heavy support and flank security. The Deneb contingent, comprising one complete four-ship squadron and a provisional squadron of two Amara-class cruisers and a Gionetti-class light cruiser, was deployed in a different role.

These two squadrons, along with destroyers and tankers, formed one segment of the advance guard as elements of the Deneb fleet prepared to transfer Spinward. However, authorisation to move capital ship squadrons out of Deneb was slow in coming, so the sector fleet commander sent his cruisers ahead, ostensibly to conduct fleet reconnaissance in force. This polite fiction gave the rear-admiral, commanding the task force, leave to advance into the Rhylanor and thence Aramis subsectors with a view to securing the route of the heavy squadrons and obtaining a clearer picture of the strategic situation.

Arriving in Rhylanor subsector in late 1082, these two squadrons were assigned to strengthen the 'Aramis flank', which had been stripped of major combat units to counter the Zhodani advance into the Jewell and Regina subsectors. Ultimately, the four-ship squadron was transferred to Spinward as well, initially seeing action against raiding Zhodani cruisers in the Regina subsector.

In the Aramis subsector, Vargr raiders enjoyed what became known as a 'happy time' for the first months of the war, taking full advantage of the distraction of the Spinward Marches sector fleet to wreak havoc. Repeated appeals from the subsector admiral simply could not be met with anything more than a token destroyer or two; the sector fleet was too busy trying to stem attacks on major worlds and prevent the destruction of its interstellar infrastructure behind the lines. The arrival of six heavy, and one light, cruisers from Deneb was a turning point in the fortunes of the subsector.

All seven cruisers, plus their supports, were employed in an initial strike against Vargr forces assembling off Galla, just over the Imperial border. At the very beginning of 1083, the strike force arrived and shattered the assembled corsairs. Although the Vargr force included several cruiser-sized vessels, it was caught unprepared and its response was disjointed. Operating as three two-ship divisions, backed up by the light cruiser and destroyer force, the Imperial ships overwhelmed several enemy vessels before serious opposition materialised.

Officially named Operation Malwe, the raid is known in naval circles as the Great Galla Regatta and was a total success. Only one of the Amara-class cruisers, INS Uranush, was significantly damaged. Afterward, the force withdrew to Imperial space, with the full squadron then transferring to the Regina subsector where it was assigned to counter-raider operations in the rear of the

Spinward Marches fleet. The light cruiser and other two heavy cruisers then began similar operations in the Aramis subsector.

Fortunes were mixed for these ships. Initially all went well, with raiding greatly reduced during what has been described as the 'stunned pause' after the Galla Regatta. The intensity of raids gradually increased throughout 1083, with the heavy cruisers assisting those elements of the subsector fleet that had not been drawn spinward in protecting the worlds of the cluster.

INS Uranush was further damaged in a scrappy action off Lablon and suffered a series of equipment breakdowns thereafter. She was pulled out of the line in late 1083 to serve as a defensive monitor at Aramis, where she saw no further action. Her sister, INS Kakakema, in company with the light cruiser INS Emmanuel Vaansiir, made a second foray to Galla in mid 1083 and thereafter participated in minor actions along the Aramis frontier. Both survived the conflict to return to Depot in Deneb at the cessation of hostilities.

Of the four-ship-squadron, a division consisting of INS Baminniruk and INS IIrimu spent the entire conflict on the section of the Spinward Main in the Regina subsector. Their most notable action was the destruction of a Zhodani strike cruiser, just minutes short of firing range of the Highport at Uakye. INS Naknane was also active in this theatre for a time, before reassignment to a scratch force of cruisers and reactivated reserve battleships sent forward to assist forces defending Jewell. Although repeatedly damaged, INS Naknane was never forced out of action and ended the war as a task force flagship.

The last of these ships, INS Rukumer, suffered severe damage at the Battle of Two Suns. With her spinal weapon put out of action early in the battle, her captain initially attempted to open range and hold off the enemy with missiles but once ammunition was expended INS Rukumer had no option but to close the enemy and engage with her fusion guns. Images of this ship, on fire and trailing debris from its torn spinal weapon column, furiously charging at a Zhodani destroyer squadron to protect the force's tanker supports, have featured on several commemorative items including posters and an approved Imperial Navy screensaver.

INS Rukumer misjumped whilst attempting to retire after the battle and was presumed lost for several weeks, yet eventually made port under her own power. She was decommissioned due to being deemed too expensive to repair; and her weapons reassigned to a number of defence-enhancement projects in the region. 'A gun from INS Rukumer' has become a prestige item, with several world governments asking to purchase one as a ceremonial weapon or part of their planetary defences.

After the end of the Fourth Frontier War, the Amara-class saw little action. Most vessels were assigned to fleet squadrons, generally performing well in exercises but rarely tested in combat. The occasional one-sided engagement with a small corsair has not provided a suitable occasion to test the mettle of the class.

Although there has been no major conflict since the Fourth Frontier War, a few examples of the Amara-class have achieved note one way or another.

In 1079, INS Dusagara was the subject of a carefully planned ambush in Ley sector. Fired upon without warning with large numbers of torpedoes, she nevertheless managed to survive and defeat her attackers. Consideration was given to upgrading point defences but thus far the original fit has not been altered on most standard Amara-class vessels.

INS Kireme was lost under mysterious circumstances in 1101. Most of her wreckage fell into a nearby gas giant, making a full investigation impossible. Those hull segments that were recovered indicated massive structural failure but showed no sign of combat damage. This does not rule out enemy action but there was no indication of a powerful ship in the area that could have inflicted sufficient damage to cause such an event.

C H A P T E R - E L E V E N

MARINE CONTINGENTS

A standard Amara-class cruiser can carry a reinforced company of marines, which can be further augmented if marine operations pods are shipped. It is possible to transport a whole battalion or more in this manner but using a cruiser, rather than a troopship, for this purpose is highly inefficient.

Marines conduct boardings of suspect vessels, guard shuttles in port, and escort naval personnel engaged in tasks where they may be at risk. This is not enough to keep a marine force busy and groundside combat is rare enough that most marine companies do not see action in an entire deployment. Marines engage in training aboard vessels that have suitable facilities and also 'earn their keep' as additional crewmembers.

The marine skillset is best suited to security and damage control operations and, at any given time, there will be at least one armed party of marines roving the ship on a semi-random patrol pattern. Marines may also be stationed at sensitive points or accompany senior officers. In addition, marines help with shipboard tasks, ranging from food preparation to general maintenance, and those with appropriate skills may also serve as additional small craft pilots or gunners.

Marine battalions typically rotate between 'parts-and-pieces' deployments, in which the parent battalion will be broken up among several vessels, and whole-unit assignments. These are not always combat operations but in general a battalion will train as a whole unit and perhaps be deployed to protect a major installation, whilst its constituent sub-formations return from wherever they have been posted. Once fully reconstituted, the battalion will be made available for major combat operations – which may or may not actually take place. After a period of whole-unit deployment, the battalion will switch back to dispersed operations.

Some, but not all, dispersed operations are as ship's troops. A broken-down battalion might supply a company as training advisors to a nearby world government, a company-sized force to protect an Imperial installation and several small detachments aboard minor vessels or to guard backwater starports. These small-unit deployments allow the junior leaders of the unit to amass considerable experience in the field and a marine battalion will usually contain a wealth of experience at dealing with all manner of situations.

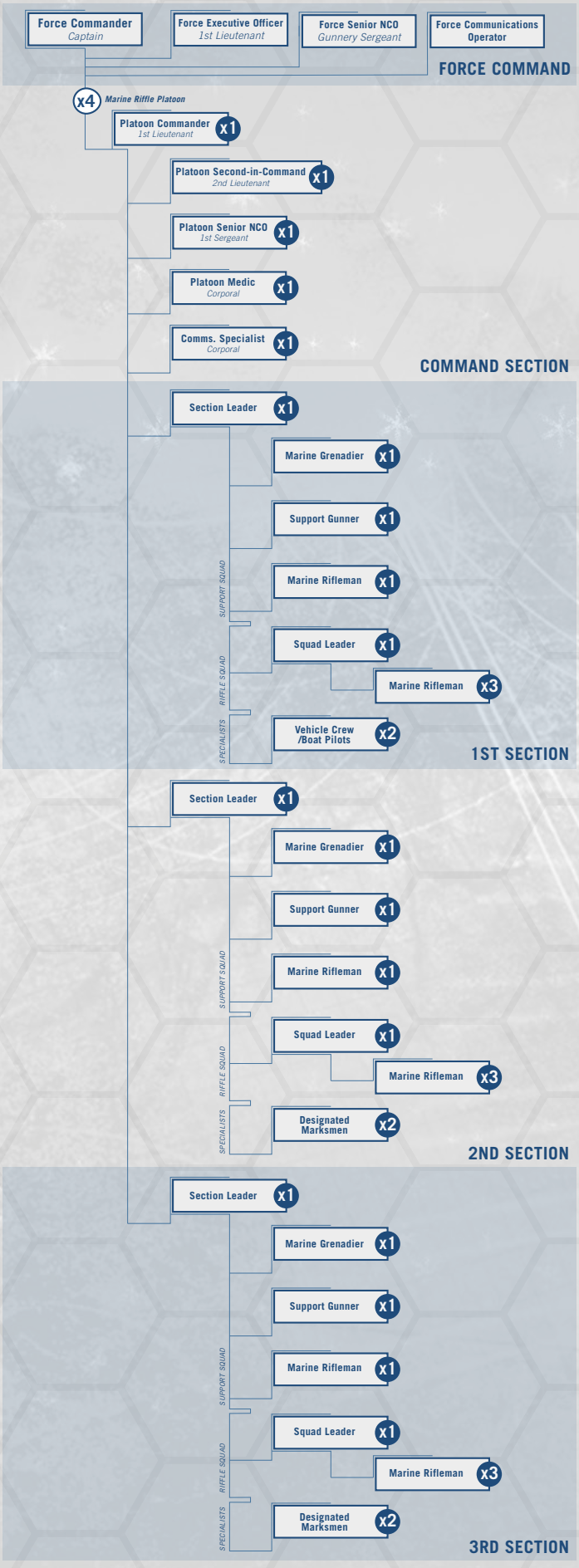
A force aboard a major warship is normally based around a single company of the parent battalion, sometimes supported by additional platoons or a detachment of specialist troops. Marines deployed as ship's troops are not normally equipped with battle dress, as the specialist support equipment needed to maintain such equipment is extremely bulky. The exception is where a cruiser is carrying a marine operations pod or orbital assault pod. The forces aboard such vessels are expected to fight groundside and deploy with their full kit; those intended for shipboard security are more lightly equipped.

Shipboard marines are usually armed with snub pistols or weapons from the 'snub' family for security operations, plus cutlasses and light body armour. For boarding enemy ships, they use combat armour and gauss rifles, which would also be broken out if there was a prospect of the ship being boarded. This is very rare and, more commonly, marines use combat armour to protect themselves from the hazards of a damaged ship as they make emergency repairs.

A marine force aboard a cruiser will normally be commanded by a marine captain, who is addressed by the courtesy title 'force commander' when aboard ship. In this context, the word 'force' has come to refer to a roughly company-sized unit of marines. Within the force, the standard marine corps breakdown of platoons, sections and squads is retained.

Shipboard forces are generally very lean in terms of officer to enlisted ratio. This is not a major problem as the force can rely on the navy to provide logistics support and specialist functions such as communications, electronic warfare and medical assistance. Marine officers aboard a warship are thus all 'fighting' officers, with staff and support personnel normally deployed where they are most likely to be needed.

The basic building block of a marine force is a squad (or fire team) of four personnel. Two squads are grouped into a section of eight personnel, with two specialists attached. These often operate detached or moved to whatever section requires their skills. Marine section and squad leaders are typically sergeants or corporals, with dispersion of ranks varying somewhat.



A platoon is formed of three rifle sections plus a command section, which nominally includes two officers. In practice, most platoons are missing one of their officers who will have been detached to carry out some other task or may be away on a course necessary for his next promotion. Specialists are sometimes grouped together to form an additional rifle section; every marine is first and foremost a rifleman.

This company of nominally 110 personnel forms the basis of a shipboard marine force. Additional rifle platoons, support platoons or specialists may be added depending upon the ship's expected mission and needs. The general term for such a formation is a reinforced company but it is more common to refer to a company-plus-supports deployed aboard a warship simply as a 'force'.

Typically, support weapons such as gauss guns, plasma weapons or portable missile launchers are carried by a shipboard force but would normally only be deployed for major groundside combat. Other supporting personnel deployed aboard a cruiser include marines who have received advanced training in vacuum operations, cyber-warfare experts or reconnaissance specialists. It can be a matter of pot luck what supporting elements a given ship receives; larger marine formations are broken down to provide shipboard contingents and the marine force is expected to make the best use of whatever assets it has available.

When not maintaining their own equipment or training, marines are often assigned to help with shipboard tasks. This is on an as-and-when-needed basis, with marines pulled from a pool of available personnel to provide expertise or additional hands. In addition, there are some specific duties to be carried out by the shipboard marine force.

When a ship carries marines, they generally take over security functions from the Crew department, although it is not uncommon for security detachments to include naval personnel who then concentrate on looking for problems with the ship rather than threats to its internal security.

Some marines are qualified shipboard gunners, sensor operators or technicians, and can assist with routine tasks when not required elsewhere. In combat, marines operate some of the ship's weapons either as an all-marine team or additional personnel slotted into a regular weapon crew.

C H A P T E R - T W E L V E

CREW DISPOSITIONS AND INTERNAL SECURITY

When the ship is at Action Stations, every member of the crew has an assigned duty station. Non-fighting crewmembers, such as chefs, may be assigned to damage control parties or sent to assist in parts of the ship where heavy work may be required. However, support functions, such as the galleys, may still require staffing. A warship may have to remain at action stations for many hours, especially in a situation where it is searching for a target or undertaking a pursuit. Keeping the crew fed and ensuring routine shipboard functions are not unnecessarily interrupted is important to long-term efficiency.

Action Stations is one of the few occasions where the most qualified people are carrying out every task. Normally, the standard shift pattern is in place and whoever is on duty handles tasks that arise. Specific personnel may be called to their duty station in order to deal with a situation that requires their expertise. For example, the chief pilot may well be asleep in his quarters when a minor manoeuvre is carried out but if the cruiser is to dock with the sector duke's yacht, the chief pilot will be at the helm.

The crew are subdivided into watches for routine duty. Most vessels operate a three-watch system but variations are not uncommon. One watch may be larger than the others or some personnel might float between watches as needed; individual captains have their own ideas about what is best. What is constant throughout the fleet is that under routine conditions, one watch will be working at their normal tasks and other personnel will be off duty. Off duty personnel are not expected to be in sensitive parts of the ship and may be challenged to explain their presence. This is one function of the security patrol.

Under routine circumstances, there will always be a qualified pilot and sensor operator on the bridge (unless the ship is in jump, in which case it may not be necessary although the controls can be used for training simulations) along with an officer qualified to stand bridge watch. There will also be a bridge-qualified officer in the secondary control room, an engineering or technical officer will be in the main power plant area, or close by, and so forth. These officers may be quite junior but there will always be someone present who can take charge in an emergency. One of the most important responsibilities of these officers is to decide whether to hit the 'captain to the bridge' alarm or request assistance from a more senior member of their department.

At all times there will be armed security patrols moving around the ship and guards may be posted in sensitive areas. Most security tasks are handled electronically, by monitoring personnel positions, logins to workstations and observing patterns. The system flags irregularities, such as an off-duty gunner wandering around the missile maintenance bays, and directs the security team to investigate. Quite often this requires nothing more than paging the chamber over the intercom system and asking the crewmember what he is doing. On any given day there are dozens of minor alerts of this sort as crewmembers go back to their duty station to pick up something they left lying around, or otherwise place themselves in a sensitive area at a time when they are not required to be there but for entirely innocent reasons.

More serious alerts require a response by a security patrol or designated response personnel. Guards will not normally leave their posts to investigate minor alerts, even if this means pulling a patrol in from halfway across the aft section. The sort of incident that will draw guards off will also bring many others and send the ship into lockdown.

It is customary to conduct an 'area check' after any major shipboard operation, such as entering or leaving jump space. This requires personnel to check their immediate area and note any causes for concern. At the same time, security patrols will sweep the entire ship. Aboard a large ship this is usually a task for the marines, although 'security' does not just mean searching for intruders. A suspicious groaning noise, from a major structural component, indicates a potential threat to the safety of the ship and merits a response.

The security patrol spends a lot more time searching for contraband among the crew, and reminding personnel to secure loose objects, than responding to alerts. It is considered preferable to have people carrying out these tasks, rather than simply watching screens or monitoring alerts from the automated system. Cameras can be spoofed or alerts suppressed and, in any case, the interaction of a patrol with the crew is deemed a better reminder and reassurance than any number of cameras.

PERSONAL WEAPONRY

Although the navy is not in the business of battling it out with enemies using hand weapons and small arms, a large number of weapons are carried aboard a major warship. Most are held in armouries or security lockers and issued only at need, although officers keep their personal sidearm in their quarters.

Regulations require that all officers have a sidearm 'available for use at need'. In practice, this means an officer is expected to arm himself from the nearest security locker if the need arises, although designated officers have their personal weapon with them when on duty. Designated officers include the officer of the watch, any officer leading a security patrol or boarding party and those engaged in especially sensitive duties, such as moving warheads between secure storage areas.

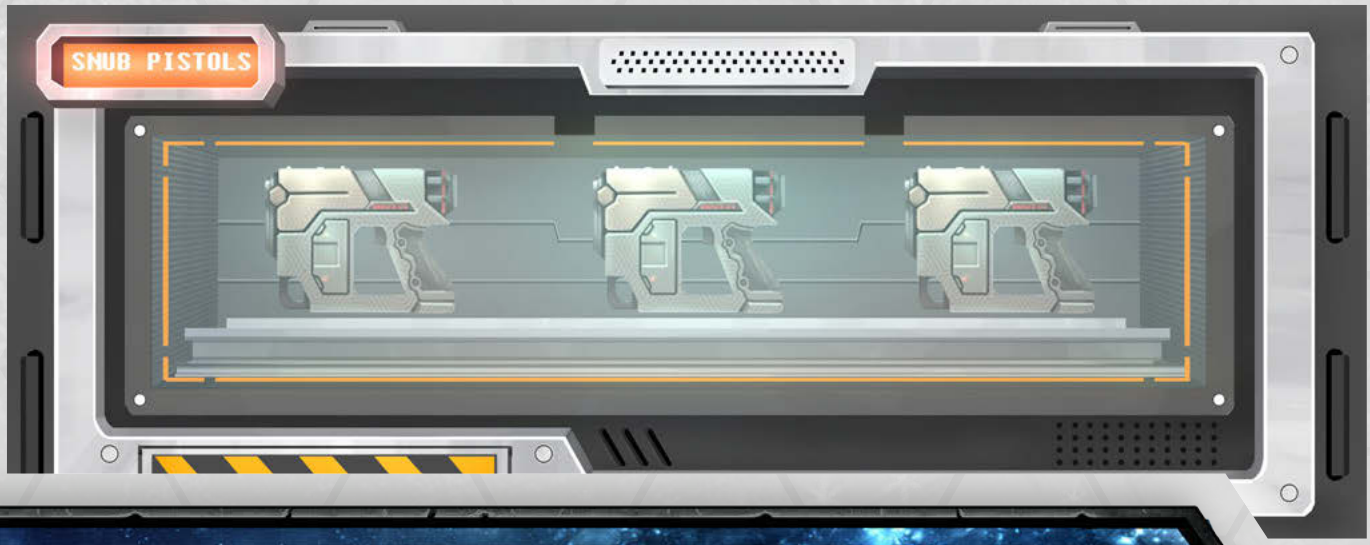
The requirement to be armed is interpreted by captains in a variety of ways. Some require weapons be carried in a holster, whilst others prefer that an officer rushing to his action station not stop to strap on a handgun he will probably not need. No officer would desert his post to get his pistol and, in any case, arms lockers are present in critical locations, such as the bridge and drive rooms. A gun in a desk drawer is entirely acceptable – naval officers should be first and foremost concerned with their shipboard duties – but officers can obtain weapons quickly in the event of a security alert and do not have to wait for someone to authorise access to the gun locker.

The situation is different with enlisted personnel, with a few exceptions such as the master-at-arms. Those engaged in work that requires them to be armed, such as sentries in the docking bay, boarding party members or security patrols, are issued a weapon at the beginning of the duty and are required to hand it back at the end, accounting for every round of ammunition they were issued unless a combat situation occurred. In that case, personnel are required to present an account of why they discharged their weapon but cannot be expected to recall whether they shot five times or six. After-action reports will be compiled using security camera data and other sources, which usually permits discrepancies to be spotted.

When on security duty, marine officers will be armed with their personal sidearm and all marines carry cutlasses or firearms 'as appropriate'. Most captains do not authorise the issue of groundside combat weapons, such as gauss rifles, unless heavy combat is expected; a gauss rifle can do a lot of damage to a ship's internal systems. More commonly one section is ordered to 'make ready rifles', i.e. proceed to the armoury and draw personal weapons ready for deployment, while the others are issued snub weapons for shipboard security.

In addition to a handgun in each officer's quarters, and the contents of the ship's and marine armouries, there are additional weapons aboard ship. At key locations such as the bridge and gunnery room, there are small gun lockers each containing four snub pistols plus belts and webbing, and three magazines for each weapon.

Most weapons are stored in the armouries, along with body armour and supporting equipment, such as breathing masks. The latter are of no use if the ship is holed and decompressed but will protect crewmembers against smoke inhalation whilst fighting fires and permit the use of gas grenades to pacify opponents if appropriate.



HARDWARE AND ORDNANCE

Most equipment carried aboard an Element cruiser is standard issue for the navy or at least standardised across a sector fleet. All systems are interoperable with other navy and marine equipment and, in most cases, with army and scout service hardware as well. However, the navy does have its own versions of some equipment and there are legal protections in place to prevent unauthorised manufacturers producing 'navy-style' equipment without proper permits.

11/92428 GAUSS PISTOL, NAVY MODEL (OFFICER)

The Model 998 is the latest in a long line of near-identical 'navy model' gauss pistols. It differs from the 'army model' in that it has a significantly longer barrel, giving the weapon a delicate and elegant appearance – or making it look a bit flimsy, if you ask a marine. The Model 998 is entirely serviceable as a combat weapon but less handy, in close quarters, than the shorter barrelled version used by the army and the marines. Magazines and most components are interchangeable; the design is more heavily influenced by appearance and 'navy culture' than combat effectiveness, although this is not much of a drawback in a weapon that serves mainly as a badge of rank.

Weapon	TL	Range	Damage	Kg	Cost	Magazine	Magazine Cost	Traits
Navy Model Gauss Pistol	13	25	3D	1	Cr600	30	Cr15	AP 3, Auto 2

10/95995 CLOSE ASSAULT WEAPON/CUTLASS (NAVAL ISSUE)

These two weapons are essentially the same, with different designations depending upon which service they are supplied to. The marine 'close assault weapon' version has a larger and more open handguard to accommodate battle dress or combat armour, taking the form of a half-shell guard rather than the ornate basket hilt of the naval version. Both are identical in performance.

The cutlass is a heavy-bladed cutting sword whose point is sharp but not well positioned for thrusting. Very much a weapon for desperate close combat, the cutlass is well suited to opening holes in an enemy's vacc suit without damaging shipboard systems.

Weapon	TL	Range	Damage	Kg	Cost	Traits
Cutlass (Naval Issue)	12	Melee	3D+1	3	Cr800	-

11/77981 NAVAL SNUB PISTOL

The standard shipboard sidearm for naval personnel and marines is a low-velocity, high-calibre pistol traditionally called a snub pistol. Naval snub pistols are sometimes referred to as 'combat' snub pistols to differentiate them from the revolver type more commonly available to civilian security personnel. The semi-automatic pistol variant has the advantage of a somewhat greater ammunition capacity to the revolver and faster reloading.

The design of the pistol is not unusual among combat snub weapons. It has no external moving slide, to reduce the chance of snagging on a vacc suit, instead using a wraparound bolt much like many small submachineguns. This creates a bulky weapon, heavier than an autopistol of the same capacity, but this helps absorb recoil forces and the low barrel position creates a lower axis of recoil, making the weapon less likely to flip the user when used in zero-g conditions. Ammunition feed is through the base of the grip, normally using a 12-round magazine, although 22-round magazines used for the carbine can be used.

Weapon	TL	Range	Damage	Kg	Cost	Magazine	Magazine Cost	Traits
Naval Snub Pistol	12	10	3D-3	-	Cr300	12	Cr20	Zero-G

11/61153 NAVAL SNUB CARBINE

The carbine version of the naval snub pistol uses the same receiver with a longer barrel and a folding stock. It is fitted with a bayonet lug and mounting point for holographic or optical sights. Operation is still semi-automatic and, overall, the weapon is little more effective than the pistol version, other than possessing a longer effective range. The carbine 'looks the part' however, and is issued by preference to sentries and at least some members of a boarding party. Its blocky and businesslike appearance is considered to be sufficiently intimidating to potential troublemakers that it is worth the extra weight and bulk on what is essentially still an overgrown pistol.

Weapon	TL	Range	Damage	Kg	Cost	Magazine	Magazine Cost	Traits
Naval Snub Carbine	12	75	3D-3	-	Cr500	22	Cr30	Zero-G

01/61693 SHIPBOARD SECURITY ARMOUR

Security armour is designed to offer a limited degree of protection whilst retaining the mobility required by personnel operating in tight spaces and to do so whilst maintaining a generally smart appearance. As such it is subject to a number of compromises.

The armour is designed to fit over standard shipboard working uniforms, or other clothing, and does not provide vacuum protection. It consists of a light, flexible back-and-breastplate with pockets and attachments for equipment, as well as a helmet with neck protector, which hooks to a flexible support on the back of the armour to give good back-of-neck coverage. The helmet has a transparent pull-down emergency face covering, which can also be hooked to the collar of the breastplate, giving a measure of protection against gas. It will not provide air but will protect against tear gas or the like. Arm and leg protectors are available to match the armour but are not carried aboard most vessels. They are used by shore security police upon occasion, especially when shore leave gets out of hand.

Armour Type	Protection	TL	Rad	Kg	Cost	Required Skill
Shipboard Security Armour	+4	12	-	5	Cr500	None

01/89096 SHIPBOARD WORKING DRESS

Providing every crewmember with multiple sets of shipboard working dress represents a significant expense for the navy, however this is offset by its extreme durability under normal conditions and the lives it saves when a ship is damaged or holed. Working dress consists of a coverall-like garment, which removes and keeps moisture away from the skin but provides a modicum of protection in vacuum. It is not a vacc suit, and should not be used as one, but the ankles of the 'shipsuit', as it is sometimes called, seal to its boots and the addition of an emergency kit containing gloves and a bubble type headcovering can allow a crewmember to operate for a few minutes in a holed compartment.

A crewmember pairing normal working dress with security armour (as most security details do) has a few minutes to act, even when the compartment is holed, permitting self-rescue or assistance of unprotected colleagues. The fabric of working dress is sufficiently resilient that it can save lives in combat, such as when hot fragments of metal spall off the inner surfaces of a compartment as the ship takes damage.

Armour Type	Protection	TL	Rad	Kg	Cost	Required Skill
Shipboard Working Dress	+1	12	-	1	Cr250	None

01/49105 NAVAL VACC SUIT

The Model 998 is the current standard for navy vessels, with many ships using older designs to the same general specification. The navy's procurement process provides careful oversight of such critical systems and suits are carefully maintained by well trained personnel. The occasional faulty suit does reach a naval base but almost all are removed before they reach operational vessels. Older suits are sold off by the navy long before they are worn out, and represent a good investment for those wanting a well-maintained suit at a budget price.

Naval vacc suits are expensive, not least because every suit has to have accessories not required by civilian operators. Most notably this includes a secure communications system tied into the parent vessel's encryption and scrambling protocols, and a laser rangefinder/designator is also fitted as standard. This is normally used as a tool for enhancing the precision of movement and operations outside the ship, such as repair work but can be used as a weapons designator to call in support fire. In addition the suit has attachment patches for naval rank and branch insignia, additional attachment points for tools and rescue lines, and a hip holster for a snub pistol.

Armour Type	Protection	TL	Rad	Kg	Cost	Required Skill
Naval Vacc Suit	+12	14	120	6	Cr40000	Vacc Suit 0

05/62379 KIMIM AAR - *TYPE 14 SECURE COURTESY ASSISTANCE UNIT*

The courtesy assistance unit takes the form of a grav-supported ovoid, with panels that slide back to present trays of drinks, delicacies or light pre-prepared meals. Its programming is sophisticated, enabling it to predict who will want a glass of wine or cup of coffee next and to subtly induce members of a delegation to eat or drink too much if instructed to do so. It is widely presumed that somewhere in the bowels of every Type 14 is a 'mutiny gun', which will be presented to a senior officer instead of his requested coffee if certain codewords are spoken.

	Hits	Speed	TL	Cost
	12	4m	13	Cr125000
Skills	Carouse 1, Diplomat 0			
Attacks	None			
Traits	Armour (+3)			
Programming	Advanced			

05/62331

KESHEAN GAA - *TYPE 21 ORDNANCE HANDLING ROBOT*

The Type 21 is semi-officially designated Keshean Gaa, from a Vilani phrase for someone who always gets the heaviest load or the most difficult job. It takes the form of an 6-wheeled trolley with a central cradle, surrounded by manipulator arms. The cradle is long enough to accommodate a standard missile or torpedo, and self-adjusts to hold typical configurations firmly in place. Wheeled rather than gravitic drive was chosen to reduce the chance of drift as the unit aligns itself with missile hoists and loading rams, although there is a persistent rumour that the original 'floater' design simply made crews uneasy as it zipped about with a ship-killing missile aboard.

Ordnance handling bots are used to move missiles from the hoists to the loading rams, where they are made ready for launch. They can also be used to move missiles around the ship, from one magazine to another. When in the cradle, the bot's systems will check the arming pin slots and if they are empty the bot will insert its own pins – a missile carried by a properly functioning handler bot is inert and simply cannot detonate or fire its drive. Neither can the bot move with a live missile in place – if a pin is somehow removed, the bot will lock its drive and call for crew assistance.

The cradle is designed to hold missiles but can reconfigure itself to accommodate a range of other ordnance. Anything from small arms to artillery shells can be carried aboard one of these units, although they are inefficient in this role.

	Hits	Speed	TL	Cost
	52	3m	13	Cr85000
Skills	Mechanic 0			
Attacks	None			
Traits	Armour (+4)			
Programming	Advanced			

05/62666

NAASIRKA MODEL 899 - *SECURITY SUPPORT ROBOT*

The Imperium is firmly opposed to the use of 'warbots' and autonomous armed systems in general. However, a need was perceived for a robotic platform to support defensive operations and boarding parties, and the Model 899 was the result. Examples are available for sale to private operators who can demonstrate suitable need and accountability, but by far the largest buyer is the Imperial Navy.

A Model 899 is a gravitic-supported robot taking the form of an upright cylinder with rounded ends and a central bulge. This contains a pair of manipulator arms, a fire extinguisher and a cutting torch capable of making a path through a shipboard bulkhead or even a lightly armoured hull, although not quickly. The robot is most commonly used as a fetch-and-carry device for security patrols and boarding parties, carrying heavy items of equipment or the infamous 'contraband bag'.

Far more Model 899s have seen action during firefighting and rescue operations than in shipboard gunfights but, when necessary, the robot can unfurl its casing panels above and below the central bulge, creating an instant position of cover, which can be advanced or cover a retreat. The top and bottom of the cylinder contain basic sensors and a cargo space, which is typically used to carry ammunition and emergency supplies for the security party.

	Hits	Speed	TL	Cost
	36	5m	13	Cr140000
Skills	Mechanic 0			
Attacks	None			
Traits	Armour (+6)			
Programming	Advanced			

CHAPTER - FOURTEEN

HIGH GUARD

This section contains some new options for High Guard*, introducing new weapons and tactics for the construction of fighting ships.*

Sub-Command Centres

A ship may have more than one bridge, although it can only be commanded from one at a time. Additional bridges can be set up as secondary command positions or as dedicated control areas for a particular function.

A ship that has more than one bridge can transfer control to any other bridge if the primary one is damaged, disabled or otherwise out of action. This can be done more or less instantly, however it requires an instruction from a command officer that can be over-ridden by a more senior member of the chain of command. It is the officer's position in the chain of command that matters; not which command position he is operating from. Thus if the executive officer, in the main bridge, tries to take control of the ship, the captain – who is in the secondary bridge for whatever reason – can over-rule this.

Specialist control centres can also be installed, each optimised for a single function of the vessel – for example, the power plant or missile armament – and represents an equivalent investment in terms of cost and tonnage to a small bridge. A small bridge dedicated to a particular function provides DM+1 on all checks related to that function. Note that a small bridge set up as a dedicated control area cannot be used as an emergency command centre for the whole ship.

A full bridge-equivalent can also be installed as a dedicated control area for a particular function, although this represents overkill and still only confers DM+1 on checks. However, a full bridge-equivalent can also be used as a control area for a section of the ship, such as one of the pods installed on an Element cruiser. A control space of this sort can be used as an emergency command position for the ship as a whole, although DM-2 applies to all checks outside the control room's normal field of operations.

Thus the full bridge-equivalents fitted to the missile pods aboard an Element cruiser provide DM+1 to checks associated with missile combat and can be used without penalty to do anything else within the missile pod, however an attempt to manoeuvre the ship from such a position would be subject to DM-2.

Orbital Assault System

An Orbital Assault System (OAS), sometimes referred to as a Meteoric Assault System, is a military version of the re-entry pod, optimised for getting troops or equipment to the ground, as quickly as possible, without being shot down. Other considerations, such as comfort, are considered irrelevant. An OAS includes a bulky launch unit designed to spit assault capsules out at high velocity, plus the capsules themselves.

An OAS can hold up to twelve capsules ready for simultaneous launch. Cycling more into position takes several minutes, so most OAS-equipped vessels carry enough delivery systems to permit simultaneous launch of entire units to avoid personnel getting strung out over a battle zone.

When a capsule is launched, it is accompanied by decoys and follows an evasive path that takes into account likely areas of enemy fire, providing DM-4 to attack rolls targeting it. This is integrated across the whole drop group, with the effect that most capsules in a single drop will hit the ground within one minute of one another.

Each capsule has an ablative heat shield and retro rockets, supplemented by an automatically deployed parawing during atmospheric landings. The capsule has Protection 20 and can sustain 60 points of damage before being destroyed. The occupant will normally be wearing battle dress or combat armour, however if the capsule is holed an unprotected occupant will perish.

A OAS capsule is large enough to contain a single person in heavy armour, along with personal weaponry and equipment. Capsules can be used to deliver additional equipment and supplies (up to half a ton), although if heavier equipment is to be delivered, an Orbital Support System is required.

An OAS launch system consumes 12 tons plus 1 ton per capsule to be launched simultaneously, up to a maximum of 12 capsules for 24 tons total and costs MCr4. Capsules are non-reusable and consume 1 ton and cost MCr0.25 each.

Orbital Support System

An Orbital Support System (OSS) is designed to deliver equipment in much the same manner as the Orbital Assault System, dropping up to six tons of equipment in a single capsule. The unit, with one capsule in place, takes up 12 displacement tons and costs MCr6. Loading an additional capsule into the system, once the first has been launched, takes 10-15 minutes. Additional capsules consume 6 tons and cost MCr0.5.

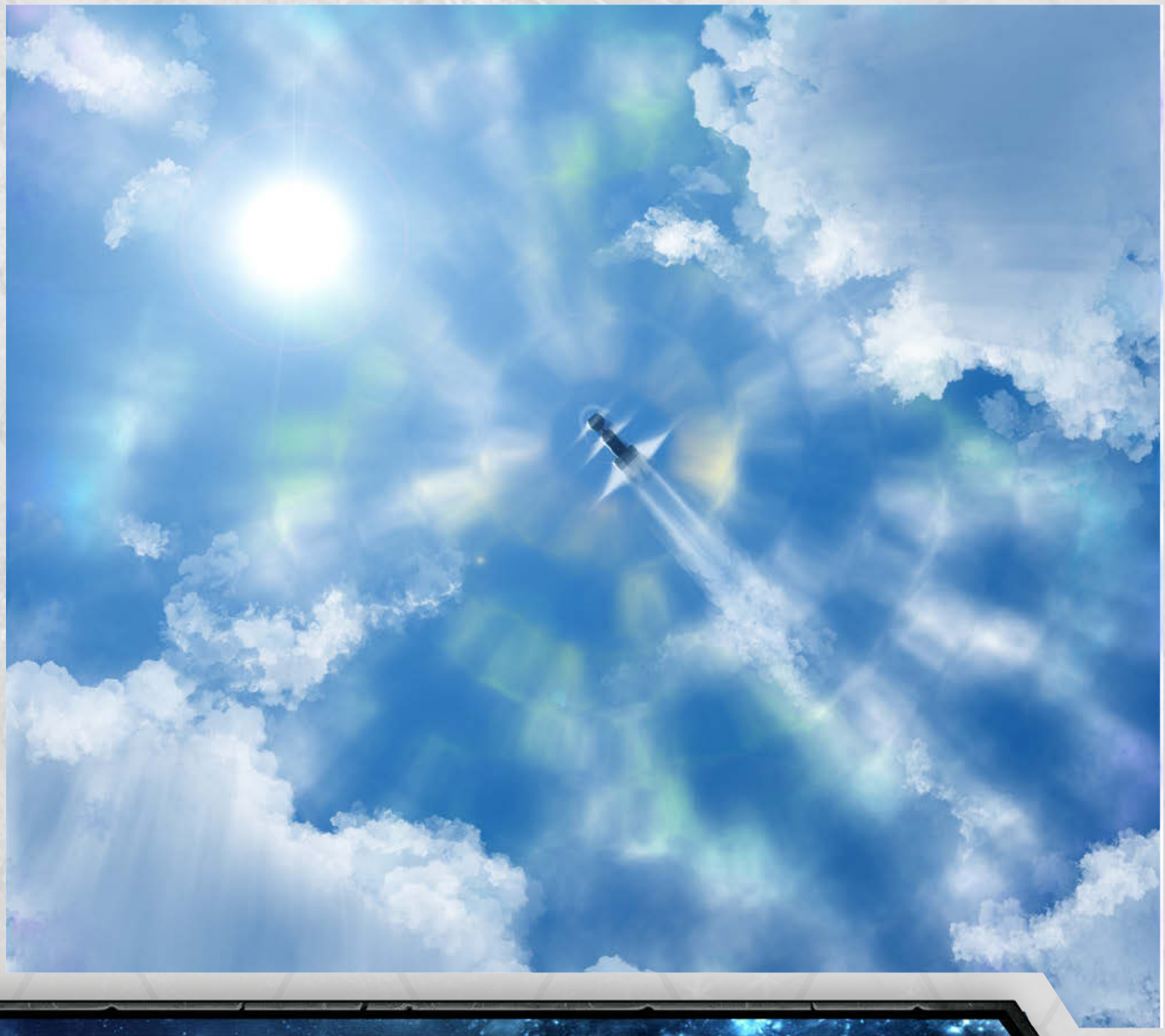
An OSS capsule gives its contents 20 points of armour and is sealed against the outside environment. It could, in theory, be used by personnel but equipment capsules tend to land harder than their personnel equivalents. Anyone riding an OSS capsule will take 2D damage upon hitting the ground. OSS units are usually located immediately adjacent to cargo areas and capsules are sometimes used to transport very hazardous cargo, allowing it to be rapidly ejected from the ship.

The Orbital Support System, with one capsule in place, consumes 12 tons and costs MCr6. Loading an additional capsule into the system once the first has been launched takes 3D minutes. Additional capsules consume 6 tons and cost MCr0.5.

New Weapon Traits

Orbital Bombardment: Weapons with the Orbital Bombardment trait suffer DM-12 when attacking any target that can manoeuvre in space combat. They suffer no penalty to bombard static orbital installations such as a shipyard or starport.

Orbital Strike: Weapons with the Orbital Strike trait suffer DM-8 when attacking targets that can manoeuvre in ship combat. They suffer no penalty to bombard static orbital installations such as a shipyard or starport.



ORBITAL BOMBARDMENT WEAPONS

Orbital bombardment can be carried out by most weapons carried by a warship but often in an ineffective manner. Beam weapons are attenuated by atmosphere and ship-to-ship missiles are not ideal for attacking ground targets. Meson guns are effective in this role but specialist bombardment vessels tend to carry weapons tailored to the task at hand.

For 'city-killing', deadfall weapons (heavy objects dropped from orbit) and nuclear missiles are the most cost-effective. Both have the drawback of throwing up a great deal of dust and debris, which can have environmental effects even if not contaminated by radioactivity. This is acceptable in a 'black war' situation and can be a highly effective threat. However, such indiscriminate attacks are avoided wherever possible, partly for humane reasons and partly for economic ones – total destruction is undesirable if the Imperium must pay for rebuilding afterwards.

Orbital bombardment weapons are more commonly used against precise targets, such as large-scale infrastructure – dams, power generation sites, space and seaports, and so forth – and industrial centres, as well as defensive installations. A bracket impact with deadfall weapons or nuclear detonations can crack hardened underground structures that otherwise might be impervious. The intent is to set up multiple shockwaves that converge on the target and combine to produce extreme forces.

Spinal Mass Driver

Virtually useless in ship-to-ship combat, a spinal mass driver propels large objects – usually slugs of metallic/ceramic or metallic/rock composition – to high velocity along the length of the ship. The projectile of choice is a custom-made penetrator designed for aerodynamic passage through an atmosphere and hardened to penetrate the ground at point of impact. At need, asteroidal material can be scavenged and given a metallic sabot to allow acceleration. Occasionally, the debris of a defeated defending fleet is reshaped into projectiles for planetary bombardment, partly as an expedient and partly as a psychological warfare gambit.

A spinal mass driver differs from a rail gun in that it launches single larger projectiles at a much lower (but still high) velocity, rather than a hail of small, high-speed projectiles. The launch velocity of a projectile can be adjusted to reduce damage if desired.

ORBITAL STRIKE WEAPONS

Orbital strike weapons are more precise than bombardment systems and are designed for eliminating precision targets close to population centres or supporting ground combat forces. The weapon of choice is a kinetic-energy missile, whose small propulsion unit serves only to place it on a 'deadfall' course to the target. After this, gravity does the rest. Orbital strike weapons also include mass driver cannon, which use smaller projectiles at a higher velocity than other mass drivers and conventional missiles.

Mass drivers used in orbital strikes are smaller than those used to attack ships, and of little value in space combat, but can readily take out emplacements, vehicles and troop concentrations. Payloads vary; some weapons use a kinetic energy penetrator but most employ dual-mode 'smart' warheads that configure themselves to attack hard (armoured) targets or increase blast and fragmentation radius for personnel and soft targets. For deep bunkers or specialist targets, such as stockpiles of chemical weapons, a penetrator/thermobaric warhead is used to create maximum temperatures and pressure after penetrating deep into the ground or a fortification.

Orbital strike weapons are housed in small (50-ton) bays, each with its own control room to collate targeting data and ensure the most precise strike possible.

Weapon	TL	Range	Base Size	Power	Damage	Cost	Max Size	Ammunition	Traits
Spinal Mass Driver	10	Short	5000 tons	+250	3DD	+MCr1500	100,000 tons	1 Slug (20tons) Cr200000	Orbital Bombardment
Orbital Strike Mass Driver Bay	10	Short	50 tons (Small Bay)	35	7D	MCr25	50 tons (Small Bay)	1 Slug (2tons) Cr2000	Orbital Strike
Orbital Strike Missile Bay	10	Medium	50 tons (Small Bay)	5	3D	MCr16	50 tons (Small Bay)	12 missiles Cr150000	Orbital Strike

MISSILES AND RELATED SYSTEMS

All missiles used aboard Imperial Navy ships fit a common specification for volume, mass and shape, which permits them to be launched from any standard system. The launcher is standardised beyond the navy and also used by many civilian vessels, although non-standard missile systems are fitted aboard many independent vessels. Electronics systems are also compatible, although this sometimes requires an interface unit to allow exotic or specialised missiles to be carried aboard navy vessels.

Like most ships of the Imperial navy, the Element cruiser uses launch and feed systems built to Specification 64CD. CD in this case stands for Continual Development; the original specification for missile dimensions dates from Year 64 of the Third Imperium and was, in fact, codified at that time but missiles of this size were in use within the preceding Sylean Federation and quite possibly the First or Second Imperium.

The standard launcher system used in navy weapons bays is a fixed-aspect design, with minimal penetration of the armoured hull by way of the launch tube. Missiles are loaded into a firing chamber by automated hoists, although manual loading is possible in an emergency. The interior of the ship is protected by a thick armoured hatch over both ends of the firing chamber but the launch tubes in the hull casing are vastly weaker than the ship's armour. This, combined with the possibility of propellant or even warhead detonation, makes missile systems a liability as well as an asset.

The possibility of sympathetic detonation is reduced by the use of compartmentalisation and strict handling regulations. In addition to the missile in the firing chamber, no more than three weapons per launcher can be held ready in the bay and, under most circumstances, no missiles are held in the bay. This reduces rate of fire, but not greatly, and makes missile operations far safer.

Missiles are cold-launched using compressed gas aboard almost all vessels. Some ships feature electromagnetic launch systems but these are considered overly complex and prone to give away the ship's position by producing intense bursts of electromagnetic radiation. By contrast, a gas-launch system has virtually no signature and can be used whilst the ship is operating under extreme EMCON (Emissions Control) protocols.

Once outside the ship, the missile begins its transit to the target area. Depending on circumstances, this can be a continual high-rate burn on its thrusters or, more commonly, a series of lower-powered burns with periods of coasting in between. In theory, missile range is almost unlimited since the weapons can be set to coast for long periods and programmed to take advantage of a gravity well. Extreme-range missile operations of this sort are very rare, however.

Missiles normally make a low-powered multiple-dogleg approach to the target area. This is slower than a direct high-burn but can help conceal both the missile salvo and launching ship. Time-on-target salvoes can be set up in this manner, with subsequent waves of missiles catching up to the first close to the target area. As a general rule, the later a salvo is detected the greater the chance that it will penetrate the enemy's defences.

The procedure for readying a missile is as follows:

1. A missile is called from the magazine.
2. Automated hoists supervised by missile technicians move the chosen weapon from its secure cradle into the magazine's ready position.
3. The missile is pre-armed with codes supplied by the gunnery room. Although ready for deployment, the missile (theoretically at least) cannot initiate its drive or detonate its warhead in this state.
4. The missile is transferred through a series of hatches by the automated transfer system. This is universally referred to as 'the hoist' even though the transfer system may not move between decks.
5. The missile arrives in the bay through an armoured hatch, which is immediately closed behind it.
6. The missile is moved to the loading position of the chosen launcher.
7. Technicians in the bay ready the missile by removing the manual arming pins. At this point the weapon is 'live' and can detonate.
8. The missile is loaded into the firing chamber by the loading system and the Ready For Launch indication is passed to the missile control room.
9. A missile that is to be unloaded or whose firing is delayed can be made safe by remote command from the missile control room but when a weapon is unloaded from the launcher it is standard practice for manual arming pins to be re-inserted as soon as possible. This not only provides an additional layer of safety but allows visual identification of a safe or live missile.

Reconnaissance Probe (TL13)

The GM-88 Kaaiisumi reconnaissance probe carries an advanced sensor package and tight-beam communications system on the same primary bus as a standard ASM-41 missile. The probe is designed to gather information, either passively or using active sensors, and is very hard to detect. A probe can be launched to 'eyeball' a distant contact or enter orbit over a world and collect data. It may also be used to assist missile targeting.

A probe might be launched ahead of time or prepositioned to provide mid-course guidance to a missile salvo, or might be included within one. In either case, it provides DM+2 to all checks associated with the strike, including the missiles' attack roll. The probe has no warhead but its on-station endurance is around 4-6 days, depending upon circumstances, or longer if operating passively in a low-power state.

Attempts to detect the reconnaissance probe while it is in a low-power state requires a Formidable (14+) Electronics (sensors) check (1D rounds, INT).

Every ton dedicated to reconnaissance drones contains 12 drones and costs MCr18.

The ILRODS System

The Imperial Navy's Integrated Long-Range Ordnance Delivery System (ILRODS) is built around the Dunkhadii Protocols introduced by Rear-Admiral Dunkhadii after the Civil War. This was not the only contribution Dunkhadii, who was at the time the head of Naval Procurement for Old Expanses sector, made to the modern Imperial Navy. Many standardised components and interoperability protocols are based on her work.

ILRODS was developed to allow a standard missile bus to deliver a wide range of warheads and other payloads, and goes far beyond standardisation in terms of dimensions and electronics. Materials intended for use in the ILRODS system are subject to strict manufacturing oversight, ensuring minimal deviation from expected performance. This is essential when launching a salvo of a thousand missiles intended to converge on a target a light-second away.

By far the most common missile launched by the ILRODS system is the ASM-62 (M) Samuui carrying a Model 994 Multimode Attack System (equivalent to the advanced missile on page 29 of *High Guard*).

The Imperial Navy maintains stockpiles of standard anti-shipping missiles (ASM-41 Aalag) as these are cheaper than the Model 994. By preference, Samuuis are used but in a protracted war situation the larger stocks of standard weapons would be broken out once the initial stockpile of Samuuis was expended.

The shelf life of these missiles with proper maintenance is 25 years or more but they are rotated out of service every 20 years, usually in block replacements conducted on a 5-year cycle. As a result, large numbers of navy surplus standard missiles become available every few years. Although most are bought by merchant lines or world governments, those with the right contacts can obtain steeply discounted ordnance on the private market. Navy surplus missiles are programmed so that they will not detonate within danger-close distance of a ship with an Imperial Navy transponder, although it is rumoured that this feature can be bypassed.

Samuui is a term used by traditional Vilani chefs (shugili) for any substance that contains more than one type of toxin. The warhead of that name carries a large conventional explosive payload inside a lightly armoured penetrator cone. In an ideal situation, the missile will penetrate the target and detonate inside, vaporising the cone to create an expanding sphere of superheated metal vapour, even if there is no atmosphere inside the target to cause blast effects.

If the weapon's onboard electronics determine that direct impact is unlikely, the warhead is detonated in two stages. The first fractures the penetrator cone along pre-cut fragmentation lines, while the second is configured into a shaped charge, which flings fragments of the penetrator at the target. This hail of jagged high-velocity metal is less destructive than an internal explosion but can still cause significant damage.

A variety of specialist warheads are available for ILRODS missiles, most of which are detailed in *High Guard*. Usually no more than a quarter of the missiles carried by a warship are of specialist types, unless it is engaged in a mission requiring a specific loadout.

Salvo Decoy (TL13)

The T11 Ikhuki salvo decoy missile is designed to simulate a large salvo of missiles. Each carries twelve powered submunition decoys, each of which in turn has a sensor return similar enough to a real missile to confuse sensors aboard the target vessel or its escorts. Salvo decoys can be used to deter pursuit or induce escorts to move out of position, allowing a real strike to pass through to the target. The target may be able to see through the deception if its sensor operators are on the ball.

To determine if a missile salvo is real or a decoy requires a Formidable (14+) Electronics (sensors) check (INT). DM-2 applies at ranges beyond Short, and DM -4 at rages beyond Long.

Every ton dedicated to salvo decoys contains 12 decoys and costs MCr5.4.

Multimode Decoy (TL13)

T18 (M) Sarmuushlaar multimode decoy uses a standard ASM-41 bus to carry an advanced decoy system capable of simulating a range of warships. No attempt is made to provide a visual representation of the ship, so the deception is readily apparent if the target is 'eyeballed' but a sensor package can be deceived by thermal and electronic emissions at ranges greater than Short. It is possible to programme a T18 to mimic a range of Imperial and non-Imperial ships.

To determine if a vessel is real or a decoy requires a Very Formidable (14+) Electronics (sensors) check (1D rounds, INT). Alternatively, the decoy can be used to distract
a salvo of missiles by providing their sensors with a more attractive target. A T18 can distract one salvo before it is destroyed. To determine how many missiles from a given salvo are pulled off target, roll 2D add the Effect of an Average (8+) Electronics (sensors) check, multiplying the result by 5% of the salvo. A well-used decoy can distract hundreds of missiles in a single salvo.

Every ton dedicated to multimode decoys contains 12 decoys and costs MCr6.5.

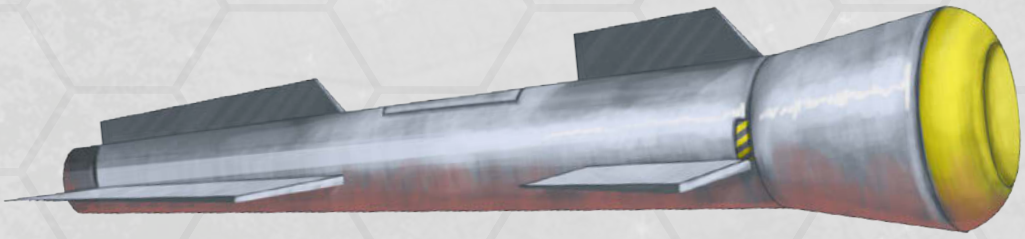
ADVANCED MISSILE OPERATIONS

The typical missile gunner will be competent enough at setting up a firing solution but will not be capable of conducting advanced missile operations. This requires training normally delivered only to specialist missile warfare officers in a major navy with huge resources. Whereas the typical gunner simply launches his weapons into the target vicinity and allows their targeting systems to do the rest, the advanced gunner has a few additional tricks up his sleeve.

Missile Ambush

A missile ambush is, ideally, set up by a ship that has not been detected but can also be performed if the launch of missiles is concealed in some way. By using extremely low-powered thrust burns, the missile gunner moves his salvo into position without the target becoming aware of the threat. Ideally, the target is then induced in some way to move towards the waiting salvo, perhaps by a fake distress call requiring a response from a patrolling warship or by the launching ship revealing itself and pretending to flee. If this is not possible, then the next-best option is to sneak the salvo as close as possible and thereby minimise reaction times.

Either way, the intent is for the target to have as little time as possible to react. A totally unsuspecting ship might have its weapons powered down and point-defence inactive, although this is usually too much to hope for with a military target. However, it is possible to set up a sucker-punch that can take out a large warship or at least significantly weaken it at the beginning of a fight. A variant on the tactic is used to cover a retreat, making it hazardous for the enemy to accelerate directly after the retiring force by dropping a 'wall of missiles' in their path. Decoy missiles are sometimes used to create a false ambush, which the enemy is then allowed to spot, either in the hope of deterring a pursuit or causing the enemy to change course and run into the real salvo.



To set up a missile ambush, the gunner needs a dedicated missile control area, such as the battery command stations of a major warship. It cannot be done with the basic controls in a typical missile turret or even the fire control system of a corvette or similar vessel. The gunner can only include missiles from launchers under his direct control – so, for example, the missile officer in one pod of an Element cruiser cannot include missiles from the neighbouring pod in his ambush, although that pod's missile officer could set up his own simultaneously.

Setting up a missile ambush requires a Formidable (14+) Gunner (capital) check (3D rounds, INT).

Failure reduces the number of missiles in the ambush by 25% per negative point of Effect. Failure by 4 or more results in a scattered salvo that never reaches its intended position. Success imposes DM-2 on all point-defence and other attempts at defence for every point of Effect and also to Electronics (sensors) checks to detect the ambush early enough to respond. The Effect is also applied as a positive DM to the missiles' attack roll.

Time-on-Target Salvo

A time-on-target salvo arranges for multiple launches to arrive at the same time, creating an overwhelming saturation attack that can swamp the defences of even a major warship. This requires slowing down earlier launches so later ones catch up. The timing can be upset by movement of the target vessel and in any case the large number of missiles all arriving at once can result in fratricide, with missiles destroying one another. However, whilst expensive in terms of munitions, a strike of this sort can be devastating.

The creation of a time-on-target salvo requires a dedicated missile control centre and transit time to the target is increased by D3 rounds for every successive launch to be included in the final salvo.

To set up a time-on-target salvo requires an Average (8+) Gunner (capital) check (INT). DM-1 applies for every launch after the first to be included in the salvo.

Failure indicates the salvo has become disjointed and many of the missiles are scattered or have been destroyed. An attack equivalent to half a normal launch will be delivered each round for D3 rounds. On a successful check, the number of missiles in the salvo is increased by 10% multiplied by D3+Effect, for each additional launch after the first to included in the salvo.

For example, a missile officer makes four launches and tries to combine them into a time-on-target salvo. Transit time to the target is increased by 3D3 rounds and DM-3 applies to the skill check. The gunner achieves an Effect of 2, so can create a salvo containing a full launch plus three additional sets of missiles equal to D3+2 multiplied by 10% of the salvo size. The remainder are scattered or destroy one another as the attack begins. Rolls of 1, 2 and 3 result in an extra 120% of a launch, so the final number of missiles is 220% of a normal salvo, attained at a cost of several rounds' delay and four launches of missiles.

Concentric Attack

A concentric attack attempts to defeat defences by positioning missiles all around the target so that at least some of them are coming in against weaker areas of the ship. A concentric attack can only be made by a salvo of 12 or more missiles, which requires one or more bays or a linked battery of turrets. It requires a dedicated missile control centre.

To set up a concentric attack requires a Very Difficult (12+) Gunner (capital or turret) check (D3 rounds plus missile flight time, INT).

All missiles receive a DM on their attack roll equal to twice the Effect of the check (positive or negative) and in addition twice the Effect is added to the damage of each missile.

Combining Advanced Missile Attacks

Any or all of these advanced missile attacks can be combined but with an increasing risk of scattering the salvo uselessly. The gunnery officer must complete a task chain successfully to create his concentric time-on-target ambush salvo. Failure indicates he has scattered his missiles or placed them wrongly. All he is left with is a salvo equivalent to half a standard launch and the probability of a stern word from both the captain and logistics officer.