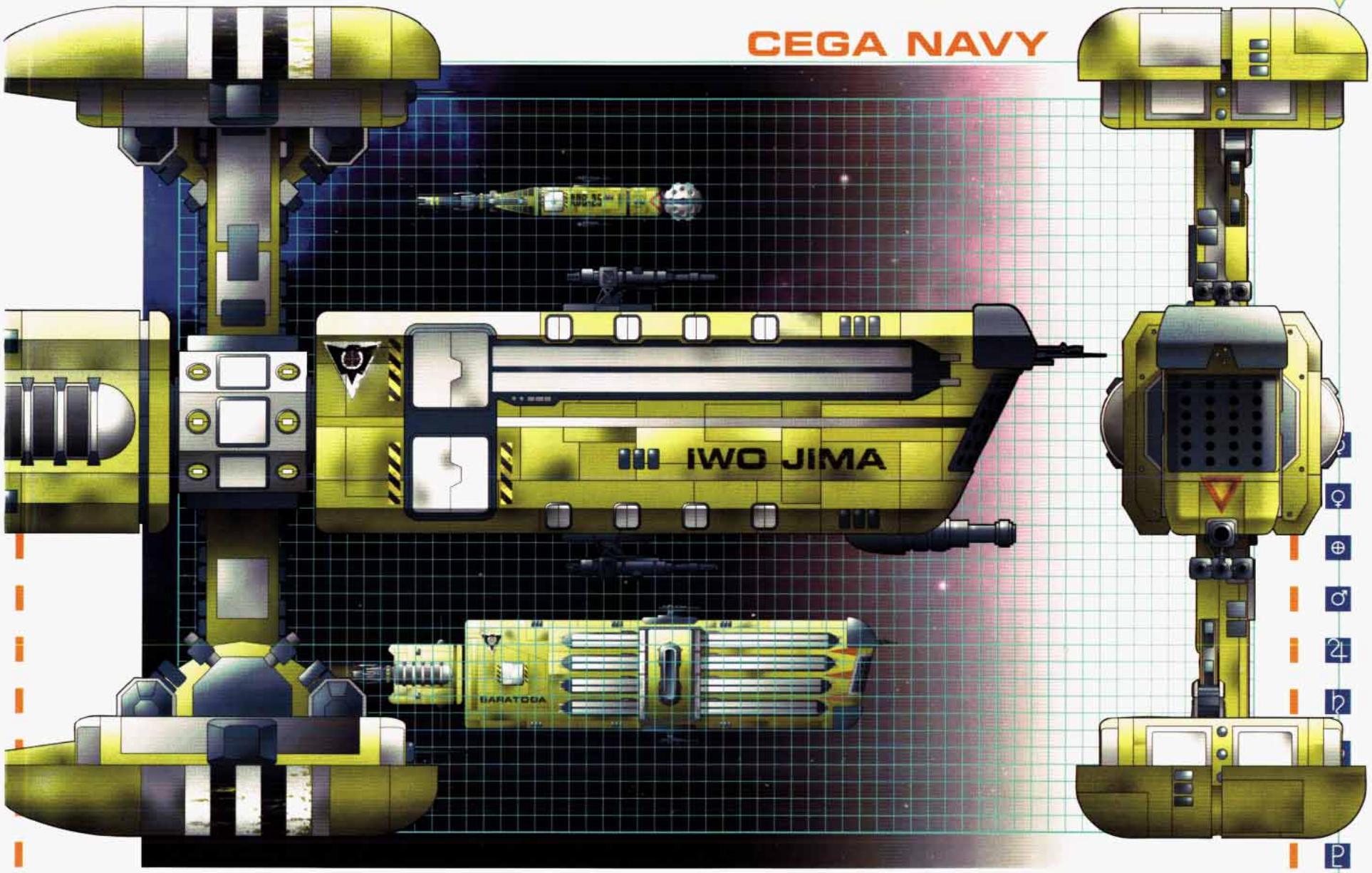
A JOVIAN CHRONICLES PROJECT

SHIPS OF THE FLEET VOLUME THREE

CEGA NAVY



by DREAM POD 9

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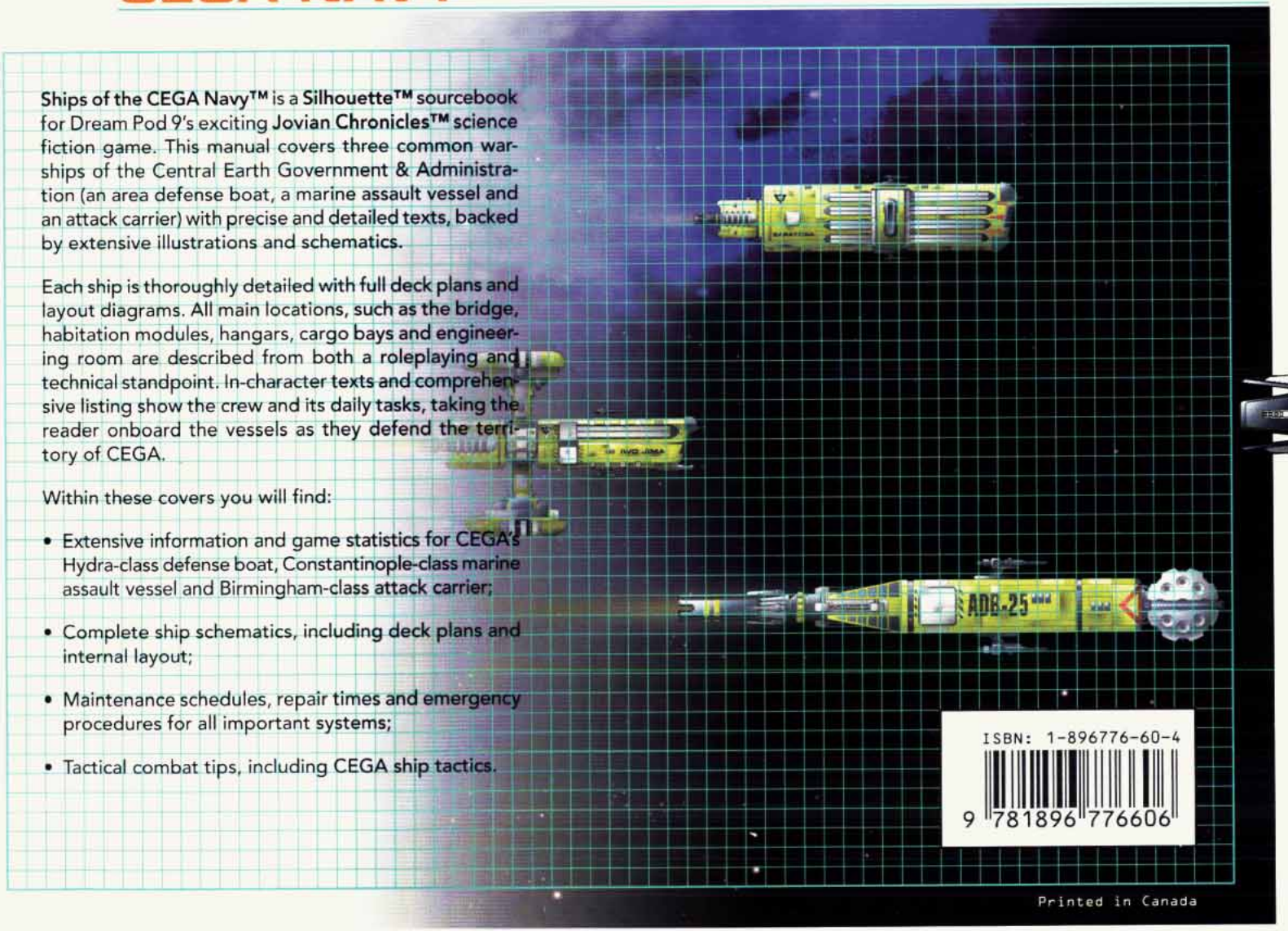


Ships of the CEGA Navy™ is a **Silhouette™** sourcebook for Dream Pod 9's exciting **Jovian Chronicles™** science fiction game. This manual covers three common warships of the Central Earth Government & Administration (an area defense boat, a marine assault vessel and an attack carrier) with precise and detailed texts, backed by extensive illustrations and schematics.

Each ship is thoroughly detailed with full deck plans and layout diagrams. All main locations, such as the bridge, habitation modules, hangars, cargo bays and engineering room are described from both a roleplaying and technical standpoint. In-character texts and comprehensive listing show the crew and its daily tasks, taking the reader onboard the vessels as they defend the territory of CEGA.

Within these covers you will find:

- Extensive information and game statistics for CEGA's Hydra-class defense boat, Constantinople-class marine assault vessel and Birmingham-class attack carrier;
- Complete ship schematics, including deck plans and internal layout;
- Maintenance schedules, repair times and emergency procedures for all important systems;
- Tactical combat tips, including CEGA ship tactics.

ISBN: 1-896776-60-4

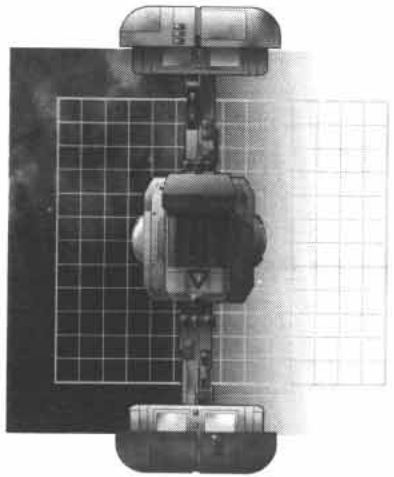
9 781896 776606

Printed in Canada

by DREAM POD 9 www.dp9.com

DP9-309

JOVIAN CHRONICLES



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Look for our page on the World Wide Web at http://www.dp9.com

Also, check out the rec.games.mecha and rec.games.frp.misc newsgroups for support and information about the Jovian Chronicles.

Stock # DP9-309
Legal Deposit: November 1999
Bibliothèque Nationale du Québec
National Library of Canada

ISBN 1-896776-60-4
Printed in Canada

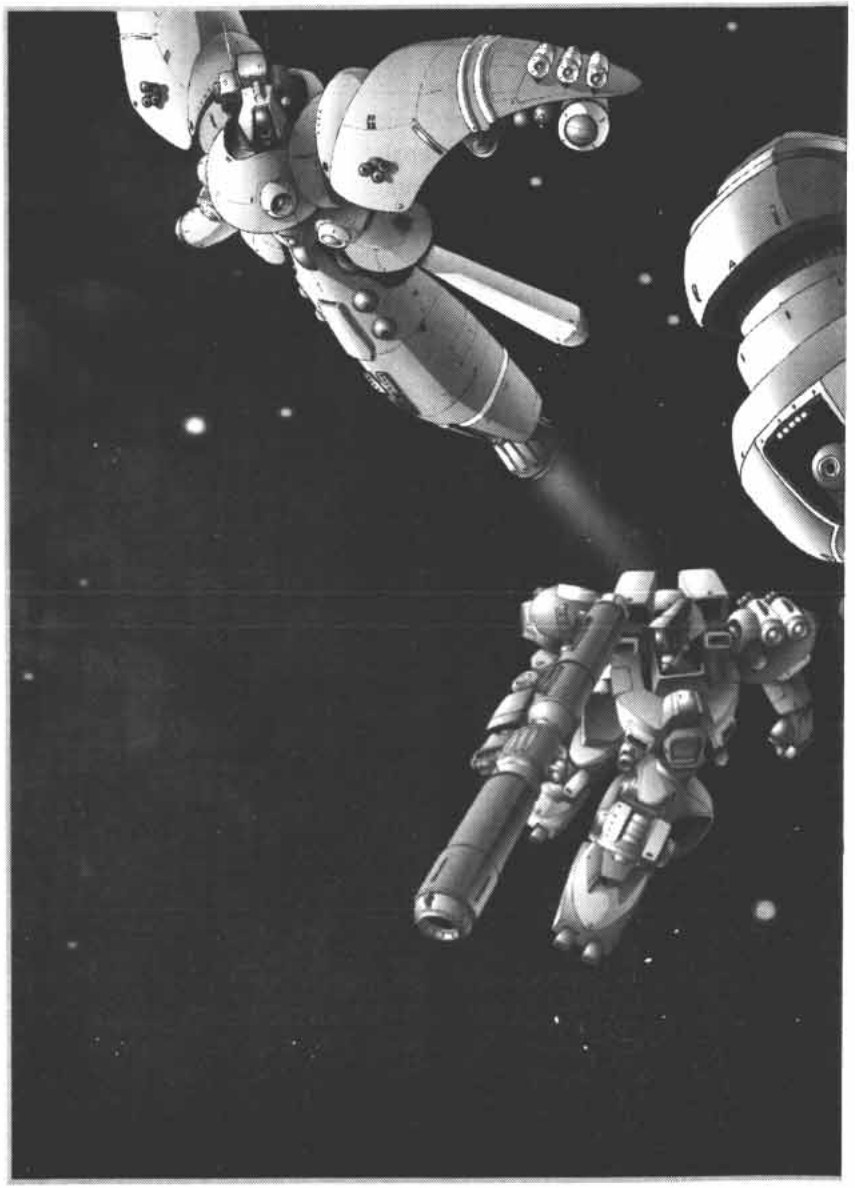
▶ 1.1 SHIPS OF THE CEGA NAVY

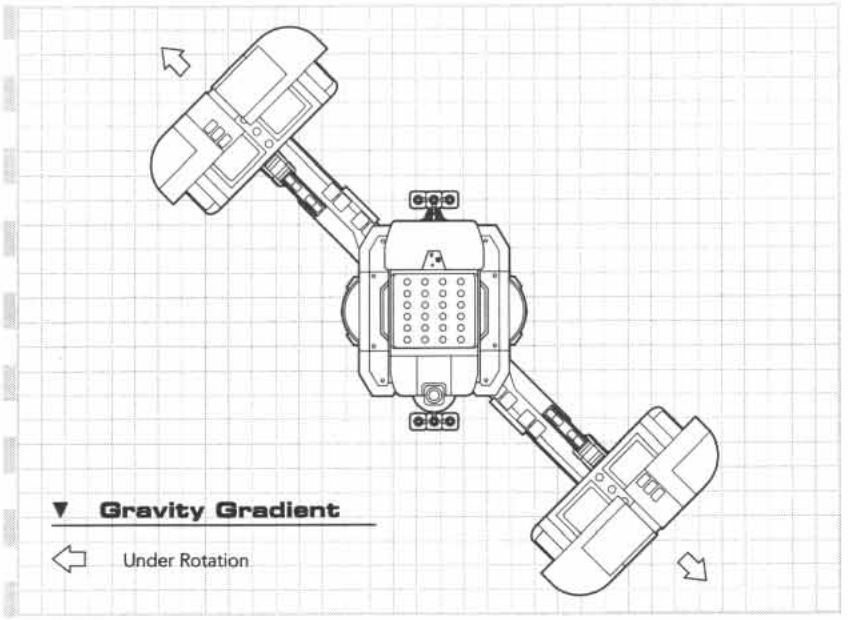
More than two hundred and fifty years have passed since the first foray into space. Colonization had well been under way when the Unification War laid the foundation for a truly worldwide Earth government. The Centralized Earth Government and Administration (CEGA), founded in 2184, continues this pursuit. There are organizations which do not share this vision on the interplanetary colonies that the people of Earth created. Whether these be governments, independents or renegades, the ever present possibility of conflict represents a concern to Mankind's continued expansion into space. The warships of the Navy thus defends CEGA in the cold reaches of space.

Historical and fictional references occasionally mention small craft making "one in a million" shots, destroying major military assets or space stations. The CEGA military feels that their most likely opponent, the Jovian Confederation, places too much trust in these exceptional circumstances. The Navy's design philosophy is thus to rely on specialized and complementary vessels as much as possible. This manual provides an overview of CEGA naval traditions and practices.

Three classes of ships used by the CEGA Navy are described in this technical briefing. The first one is the highly mobile Area Defense Boat, which is capable of creating devastating barrages of cover fire to defend ships and installations. The second one is the Marine Assault Vessel, or MAV, which provide transportation and battlefield support for the foot soldiers of the Navy: the deadly marines.

The third and last spacecraft described is the new Birmingham-class attack carrier, which is capable of carrying a full squadron of sixteen combat craft by itself. Research in the field of exo-armor design are just beginning to bear fruit, and enemy forces continue to increase in size. Larger and more powerful than the older Tengu-class carrier, the Birmingham carrier offer new options in exo and counter-exo operations.

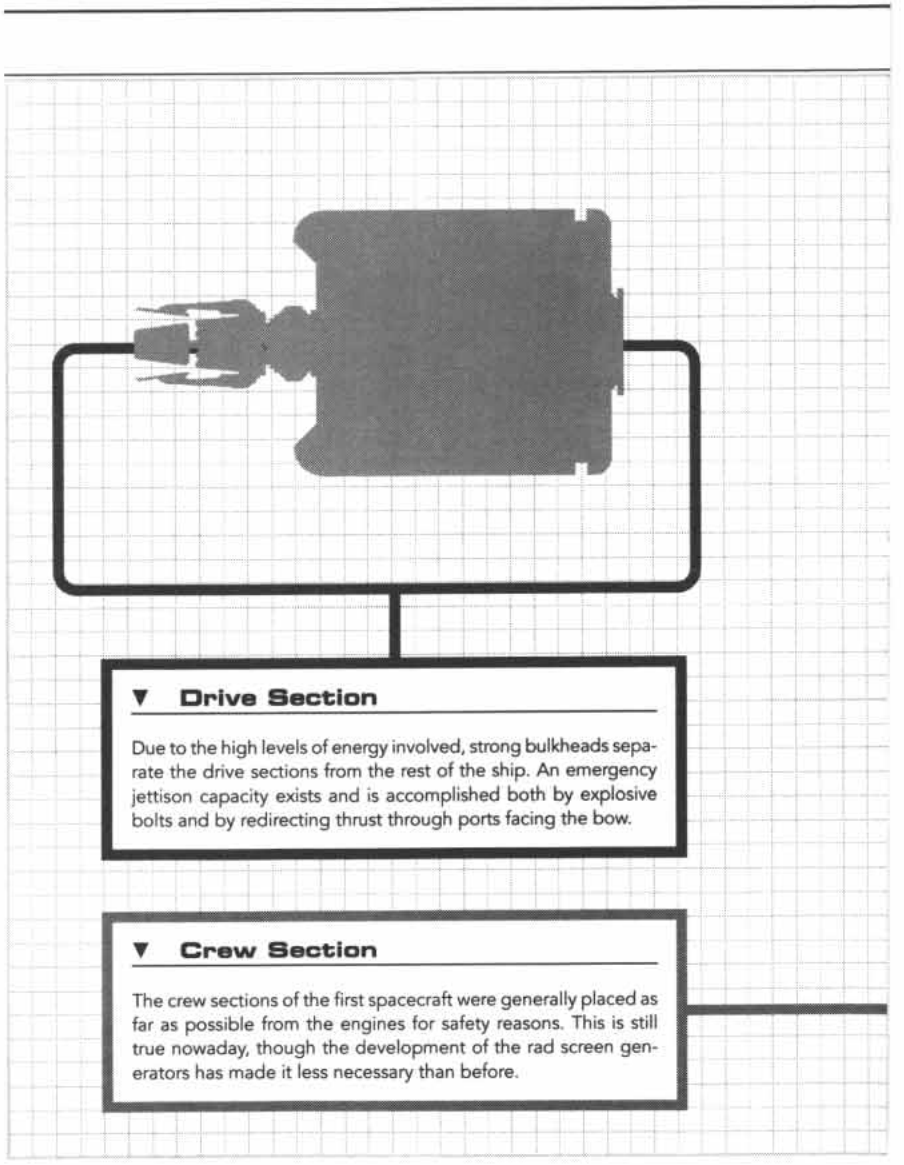




▶ 1.2 ANATOMY OF A SPACESHIP

Vessels of the 23rd century make interplanetary travel a matter of routine. Warships do much more than simply transport people from place to place, however. They are a method of policy enforcement and serve to project the might of Earth wherever they are sent. CEGA's spaceships reflect both the specialized vessel concept held dear by the Navy and the research and development process that is used to create them.

Vulnerable rotating sections are avoided whenever possible. Only ships with unusually large numbers of personnel, such as the Poseidon and Constantinople, carry them. Since most ships operate near Earth or spinning colonies, the detrimental effects of microgravity can be more cheaply fought by rotating the crews planetside on a regular basis.



▼ Drive Section

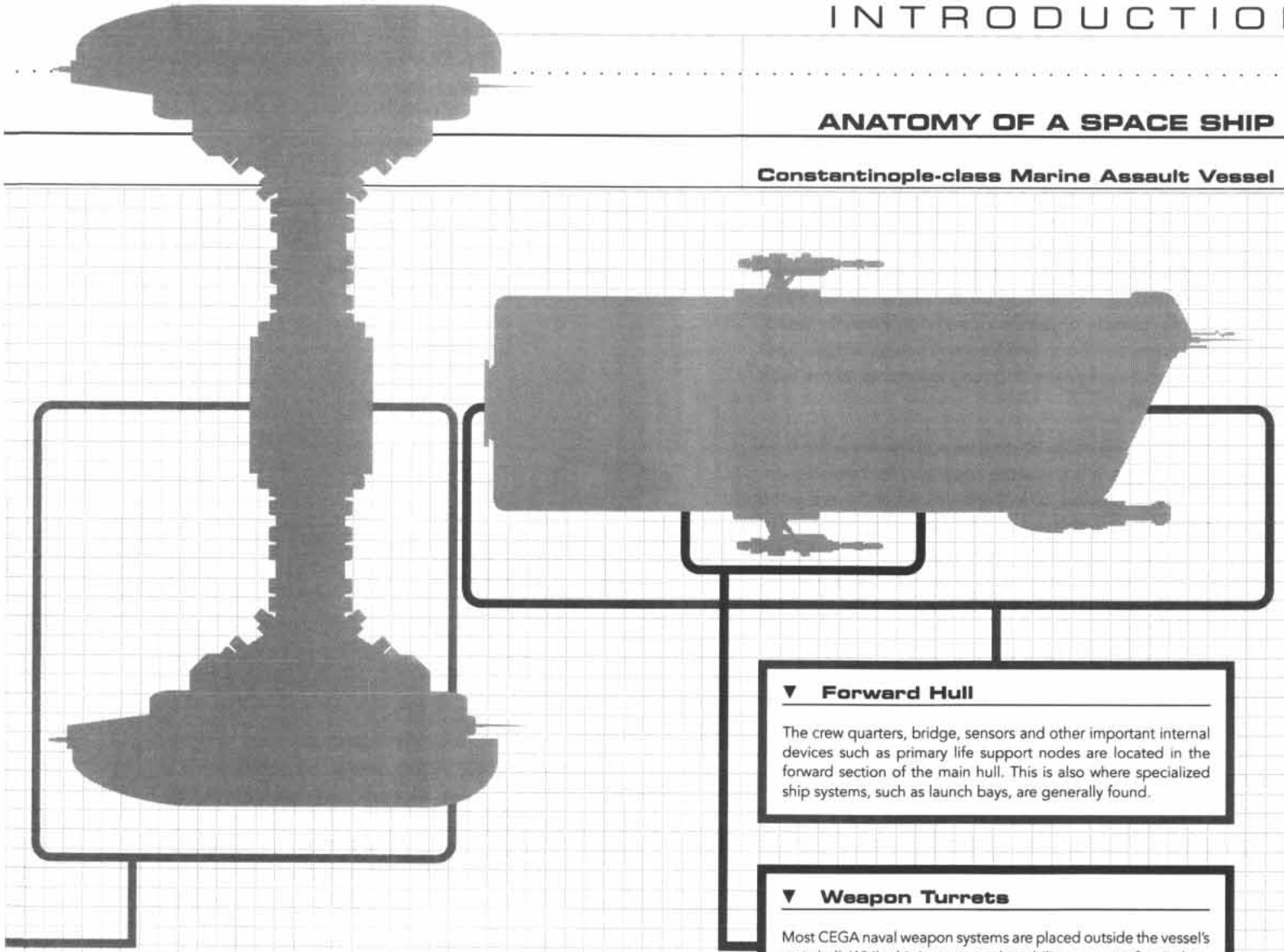
Due to the high levels of energy involved, strong bulkheads separate the drive sections from the rest of the ship. An emergency jettison capacity exists and is accomplished both by explosive bolts and by redirecting thrust through ports facing the bow.

▼ Crew Section

The crew sections of the first spacecraft were generally placed as far as possible from the engines for safety reasons. This is still true nowaday, though the development of the rad screen generators has made it less necessary than before.

ANATOMY OF A SPACE SHIP

Constantinople-class Marine Assault Vessel



▼ Forward Hull

The crew quarters, bridge, sensors and other important internal devices such as primary life support nodes are located in the forward section of the main hull. This is also where specialized ship systems, such as launch bays, are generally found.

▼ Weapon Turrets

Most CEGA naval weapon systems are placed outside the vessel's main hull. While this increases vulnerability to enemy fire, it drastically reduces the collateral effects of accidents and combat damage. It also provides weapons with better arcs of fire.

▶ 1.3 SHIP MODULES

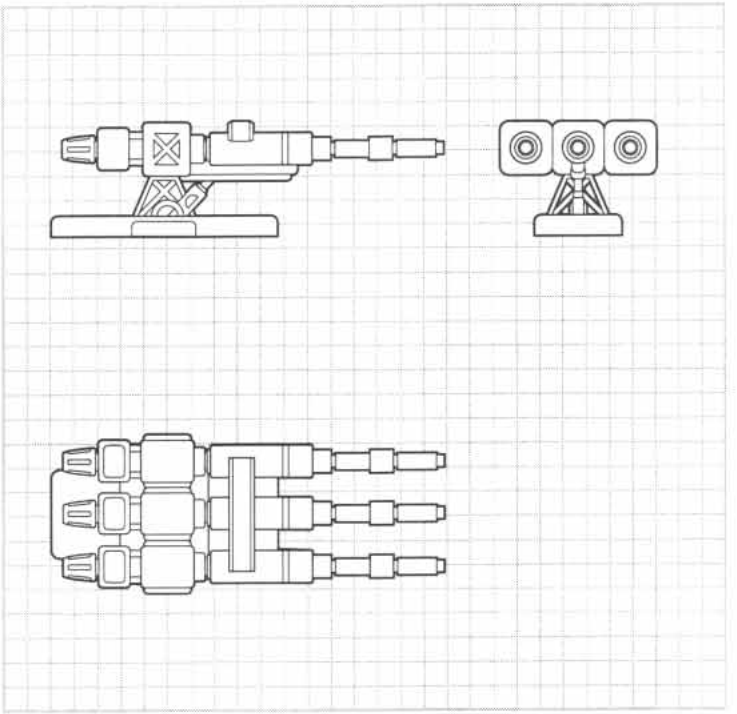
The Navy has instaured a series of development programs to generate sub-component modules for warships. Individual systems may appear in several types of vessels in order to cut cost and speed up production. The research centers for modules do not require extensive shipyards; instead they use ground-based facilities augmented by a handful of orbital evaluation laboratories. For example, particle physicists operate on Earth for weapons manufactured on the moon and tested in orbital ranges. Specialized items, such as magnetic targeting apertures, come from high orbiting stations.

Unfortunately, these new modular designs sometimes suffer from compatibility problems. It is therefore necessary for new ship designs to make use of existing, older modules which have a good track record: this allows unbiased testing of whether the ship itself fulfills its design parameters. Later on, refitted vessels will test more recent modules for compatibility and overall performance. Those that succeed will be incorporated into the new hulls during full production.

Occasionally, incompatibilities between new systems will be found. The benefit of the above procedure is that these troubles affect only a few vessels, and then only until the next refit. If these practices were not followed, an entire class of ships could have been blinded by sensor interference created by improperly shielded particle cannons or other problems.

This method of building specialized hulls with both new and proven sub-components has proven to be very effective. For example, although once afflicted by sabotage, the Hachiman-class destroyer is now such a successful vessel that it is forcing the Jovian Thunderbolt-class destroyer into early retirement.

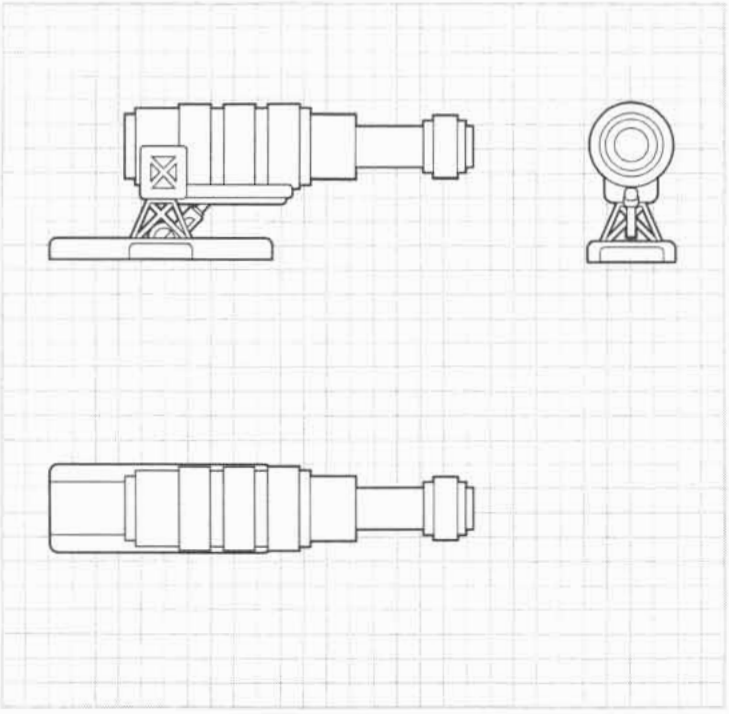
The following sample components provide additional insight into CEGA shipbuilding practices. These include the weapons, carried craft deployment systems and propulsion.

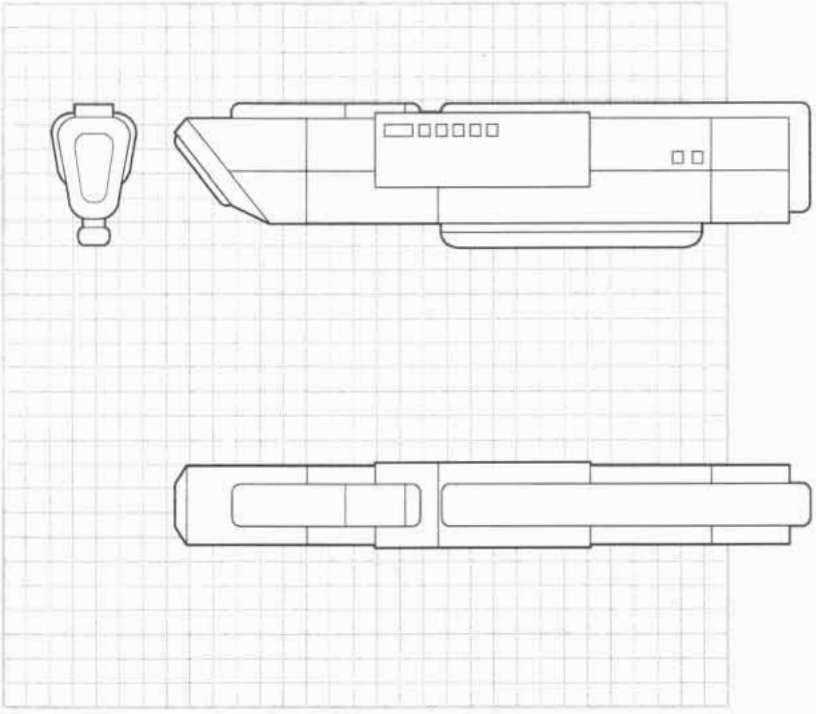


▼ 1.3.1 KKC Turret

Kinetic Kill Cannons, or KKC, inflict damage by accelerating a projectile using magnetic fields. Modern shells are built out of composite materials to provide the right balance between magnetic properties, penetration dynamics and projectile survivability. The latter is important as point defense systems intended for protection against micrometeorites can affect KKC shells as well.

A KKC's firing sequence begins with the charging of arrays of rapid-release capacitors. Energy from these is used to sequentially create magnetic fields around lines of magnets which run down the barrel of the cannon. Smaller magnets in the muzzle provide final course corrections to the shell as it is released.





▼ 1.3.2 Particle Cannon Turret

Particle cannons, or PC, inflict harm through high-energy fast-moving particles beamed onto the target. Due to the engineering of the accelerator array, few PCs can fire more than one type of particles — neutrons are generally prefered, as they maintain better beam cohesion across the weapon's mission envelope.

A slightly different configuration of magnetic fields than those of a KKC weapon are used in PC for boosting the particles velocities and for targeting, though the overall technology is similar. The primary consumption of power goes to accelerate the particles. Warships draw current from either their plasma drives or from additional generators to provide this large amount of power.

▼ 1.3.3 Missile Bay

Missiles were the first space weapons. They are independent expandable space vehicles loaded with a destructive payload which is carried to the target (though some use only their residual velocity to inflict damage through sheer kinetic energy).

Performance of the missile greatly depends on more than the payload. Targeting sensors, propulsion, fuel capacity, missile casing, electronic warfare systems and missile intelligence all contribute to the efficient delivery of the payload. Almost all missiles in use have active targeting sensors, which emit a signal that reflects off the target. Information from the reflection is used by the intelligence systems to control propulsion and fuel use.

▶ 1.4 CARGO FACILITIES

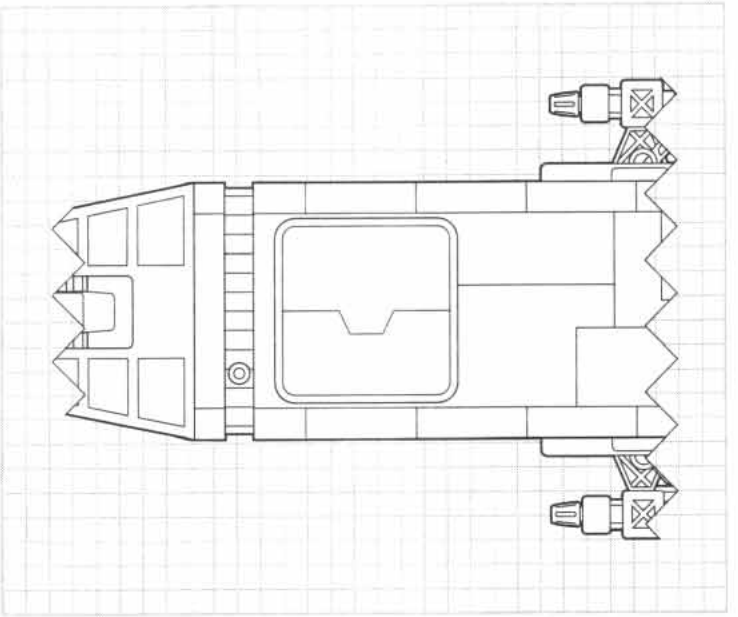
Shipboard cargo facilities are jointly designed between the Carried Craft and Hull development programs. While numerous small storage lockers are found all across a ship, the primary issue under review here is the main cargo facilities.

Movable barriers inside the cargo bay allow the storage areas to be reconfigured while in flight. This is particularly useful wen dealing with life support materials, as unusable wastes replace usable goods. Several types of external systems to assist loading, unloading, launching and recovery operations, such as robot arms and cranes, are generally available.

Color codes are used to identify cargo areas. Containers also bear the same color code system, aiding in the proper sorting of goods. The color red is used for munition storage. Yellow identifies weapon systems, such as "dry" exo-armors, auxiliary craft weapons or personal firearms. Usable life support products are stored under light blue tags, and life support materials that cannot be recycled are stored under purple. Personal effects are placed under the white classification. Black is for restricted, high security items, often fitted with alarms and under guard. Brown is used for general cargo items that do not fit under the other categories.

There are two types of striping patterns in general use. Black and yellow striping is the conventional warning pattern to denote areas of hazard, limits of safe movement or where mechanical items may be moving. Black and red striping is a more serious warning pattern denoting the presence of active weapons, such as around combat craft missile reloading areas.

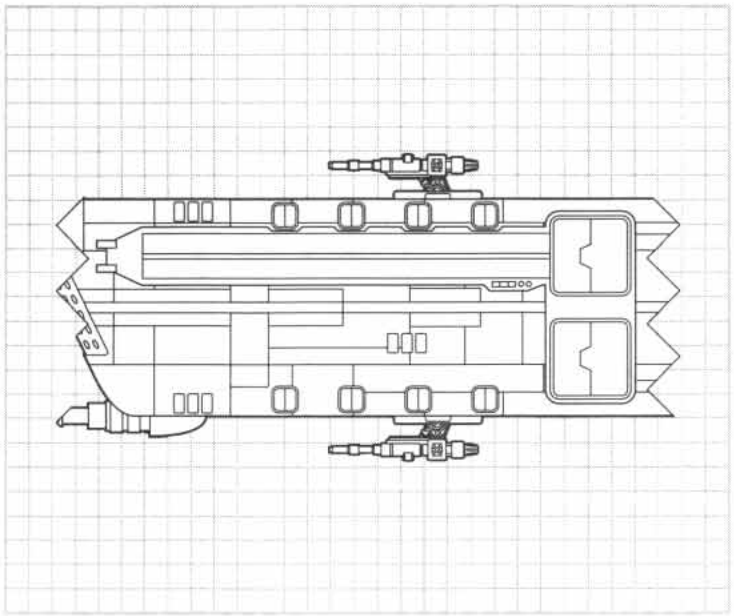
External features of the cargo bay support many levels of EVA activity: all CEGA naval vessels carry umbilical connections that allow direct and pressurized transfer between two ships. Other external features include the presence of landing lights to guide small craft into the bay. Vessels carrying interceptors or exo-armors may also have catapult systems.

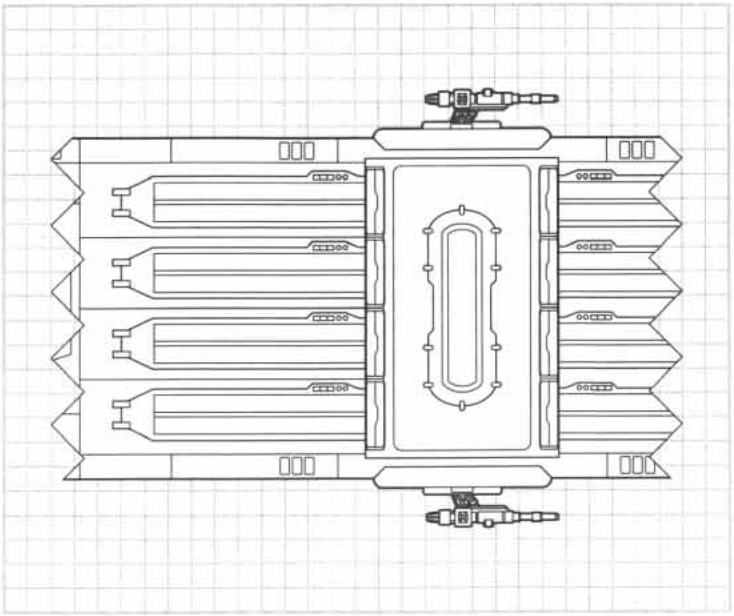


▼ 1.4.1 Standard Interface

CEGA's standard cargo interface is found on most vessels in the fleet. The doors are large enough for moving various regulation-sized cargo containers. Bay arrangements will vary considerably, but quartermasters strive to maintain one or more open channels through which cargo can be moved from one side to another.

Auxiliary craft, such as M-Pods, can easily navigate through the large doors. Just inside the bay, a series of recovery rails capture docking vehicles: hydraulic braces in the rails absorb minor residual velocities, making landings safer. Exo-armors can use their arms and legs to absorb collision energy; in the case of the Syreen and Fury designs, their arms are used to grab onto holding bars. Nonethless, interceptors are rarely carried on standard interface vessels. Landing lights and guides are present, but there are few other features to support carried craft.





1.4.2 Launch Interface

Catapult rails are mounted on ships equipped for small craft operations. The pair of rails running away from the cargo hatch easily identifies such a vessel. While craft can still egress and dock through the cargo door, the catapult rails greatly improve operations. A loading pad moves the launching vehicle into alignment with the catapult, locking it in place. Magnetic rails then accelerate the clamps and the craft forward.

Some catapult clamps have been upgraded to perform recovery operations: their clamps may extend up to three meters from the rails. This allows them to "catch" a craft with limited amount of relative motion. Interceptors and exo-armors alike possesses swiveling docking targets just for this purpose. A craft approaching a catapult-fitted vessel need only stay above the rail track to let the clamps grab them and pull them in.

1.4.3 Multiple Catapult Interface

Carriers involved in frequent launch and recovery operations have a Multiple Catapult Interface. Each launch area consists of two sets of rails, one running forward of the cargo hatch and the other running aft. The front catapult set is an enhanced system optimized for launch operations. While it does possess the regular docking clamps, the rails have been strengthened to handle the rigors of frequent launches. Internal access is also improved, allowing crews to fix and maintain the systems without going EVA.

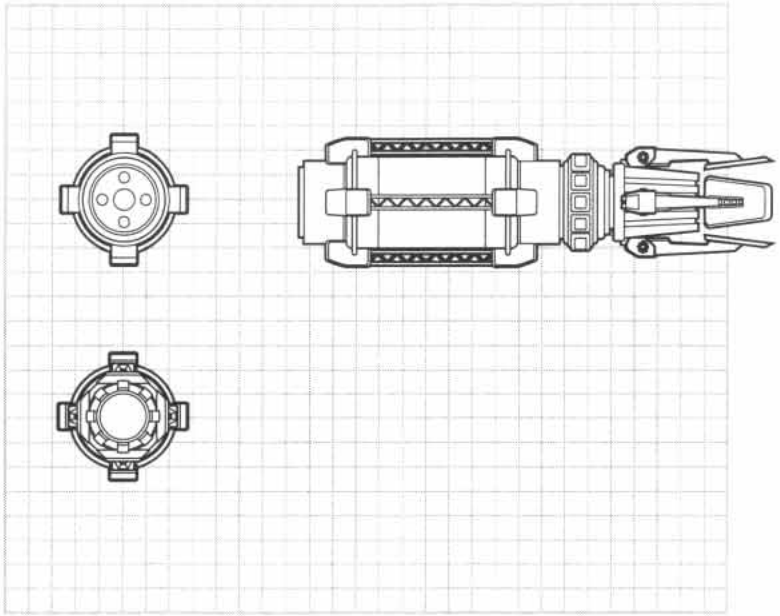
Recovery operations are the main task of the rear catapult system. The docking clamps can extend up to five meters from the hull, and their stronger arms allow them to absorb more velocity difference between the vessel and the landing craft. In the event of failure or damage to the forward rails, the rear rails can be used to launch craft as well.

▶ 1.5 DRIVE SYSTEMS

Current ship propulsion technology is centered around the powerful fusion drive called a Plasma Combustion Chamber. The main drives are located at the rear of the vessel, where the powerful plasma streams can be projected without running the risk of damaging the ship's structure. Torque forces from smaller thrusters off the center axis of the vessel provide pitch, roll and yaw , but the plasma drives are used for both linear acceleration and deceleration. For safety reasons, the drives can be ejected cleanly from the rest of the ship in the event of catastrophic damage. Armored radiation bulkheads located at the main hull interface reduce the secondary damage effects of engine explosions.

Propulsion technology is constantly undergoing improvements. CEGA's improvements to military engines soon appear in the civilian market. Any improvement in the civilian sector creates massive financial gain as cargoes can be delivered farther and faster. CEGA is currently facing an issue of being unable to prevent other powers from recruiting their engineers at the end of their military service contracts.

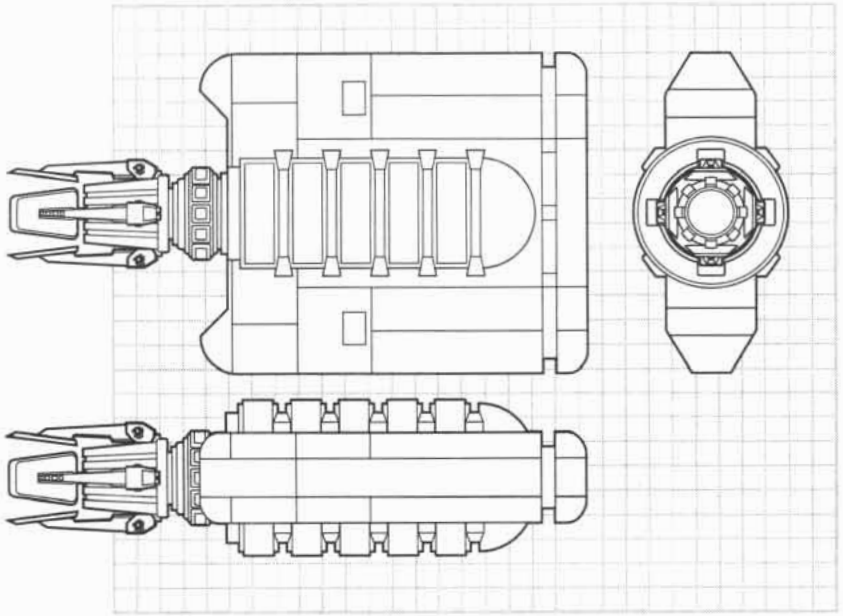
Heat management is a vital part of space operations. Space itself approaches absolute zero in the shade, while drive plasma streams temperatures are in the thousands of degrees centigrade, and sometimes more. Between these two extremes is a very narrow range in which human beings can live. Like most space vessels, CEGA warships use their main hull as a heat dissipator during normal operations. The infrared energy released can be spotted, however, so this function can be turned off; waste heat is then collected in heat dumps inside the hull. These in turn connect to devices that can vaporize water, similar to a thruster, to take the heat away from the ship. Recently, there has been a growing trend of extending the radiator fins on engines to serve as primary heat exchanger. It is possible for a ship to rotate such that the main hull itself blocks the infrared energy bleeding off the fins from hostile sensors.

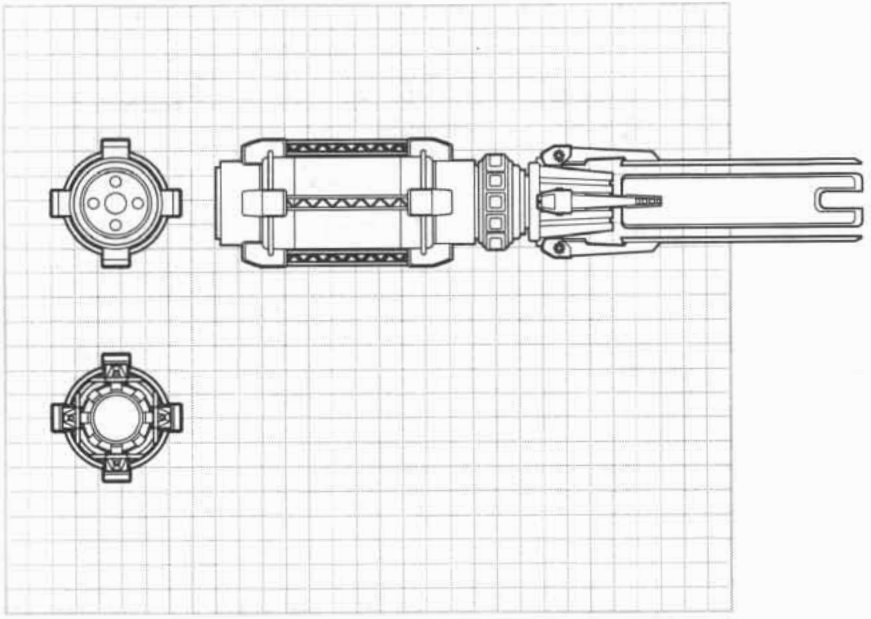


▼ 1.5.1 Conventional Engine

Based on solid, well understood engineering principles, conventional drive systems see a lot of use by the CEGA Navy. Short fins allow some vectoring of the plasma stream, allowing smaller maneuver thrusters to be used in the rest of the ship.

Each engine is separately mounted: this makes replacement and emergency ejection easier to accommodate. Each mount includes access corridors, data interfaces and heat exchanger conduits. Exchangers in the main hull transfer waste heat away from the plasma drive and into surface radiator panels spread across the ship's hull. Diagnostic gear constantly tests the mounts for wear and alignment (this arrangement is also found on civilian ships), and military vessels continuously gather data for performance evaluation. By the time a new engine or mount appears on the civilian market, it is well understood and very safe.





▼ 1.5.2 Enclosed Engine Array

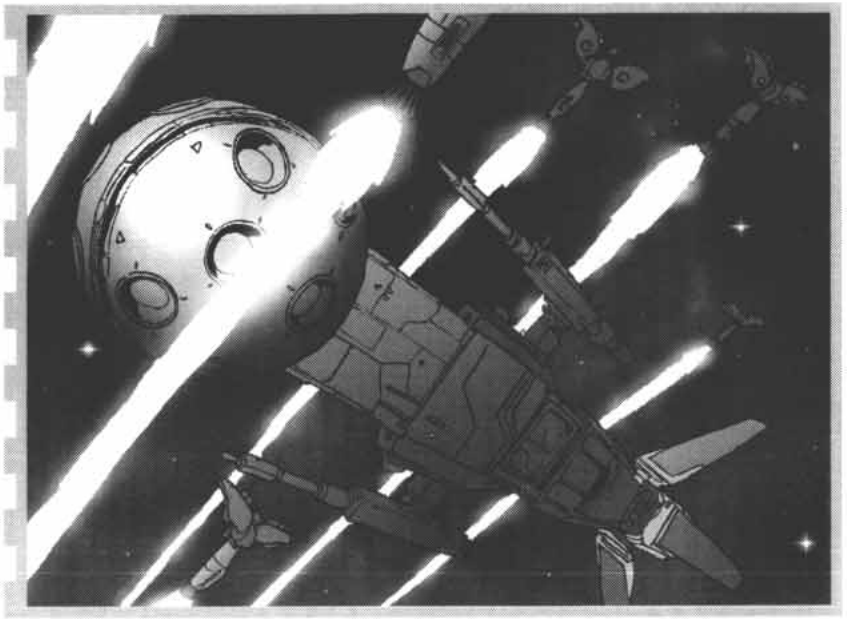
An armored enclosure is part of most military drive designs. The engines themselves do not change, they are simply better protected. There are drawbacks to enclosing them, however: maintenance becomes more difficult and often limited to internal functions only, unless the engine is fully detached from the ship. Remote robots crawl around the inside of the engine enclosure to make inspections and perform minor tasks.

The armored shell is designed to act as a heat radiator (having more dedicated surface area reduces the amount of infrared energy per point). Military vessels selectively control which radiator surfaces will be used as a further means of stealth. All enclosed engines include one-shot solid propellant rockets that can shove an engine out and away: in the event of a core explosion, the armor would trap the blast, putting the ship at greater risk.

▼ 1.5.3 Pursuit Engine

Pursuit engine are easily identified by the very long radiator fin extending aft from their exhaust coils housing. These fins serve both for thrust vectoring and for heat dissipation. With this improvement, the plasma drive can be run on higher burns for longer periods of time. Since the fins are much longer, a smaller degree of deflection is needed to create a rotation torque; this extends the hinge's service life significantly.

Removable plates on the inside of the fins can be replaced when the fin has "burned out." Similarly, the radiator systems on the outside surface can be replaced individually. This all leads to longer drive operations and more powerful burns. The latter is why this type of engine is mounted on the area defense boats: since the design allows the boats to chase down exo-armors, CEGA has termed the long-finned type as "pursuit engines."



▶ PORTENTS

Petty Officer Jason Rodriguez yawned and stretched, waking in his tiny cabin. He flung out his arms carelessly, swearing as he bashed his arms against the wall. "It figures. One of the best ships in the whole fleet, and they still make us sleep in closets!"

He hauled himself out of the bed, scrubbing at his eyes blearily and checking his chronometer. He still had half an hour before his shift would begin in the gunnery room, which meant that he had a grand total of fifteen minutes to get there. Pulling his legs forward, he let himself float to the ceiling in the ship's zero-gravity. They had been out of port for over a month and he had only just managed to get himself reaccustomed to it. Rodriguez grabbed on to the top of the storage cubby, pulling out his last clean duty uniform. Pushing himself past the closet, he struggled into the clothes, snatching up his crew belt on the way out the door.

He hadn't made it past the threshold before a pair of furry arms wrapped themselves tightly around his right leg, abruptly pulling him backwards. He flailed his arms wildly, desperately trying to shift directions as the change in momentum spun him around. He smashed into the door of the next cabin, his yelp drowned out by the cursing from inside. He slid 'down' the wall, rubbing the back of his head wearily.

Kimberly Sue, the ship's koala bear mascot, was still holding his leg in a death grip. Her large, liquid eyes blinked at Rodriguez as she carefully extracted her claws from his leg and climbed up onto his chest. Settling himself upright again, he scratched the large beast behind the ear, and she began to rumble softly. Pushing himself to one of the transit shafts, he looped his free arm around one of the conveyer handles. The system pulled him along up to the bow of the ship and its massive laser weapons.

* * *

"Hey there, Kim Sue!" greeted Matthew, the boat's other laser gunner. He leaned out in his seat, watching the pair bump their way halfthrough the hatch to the chamber.

"Good morning to you too." replied Rodriguez snidely. "How is it that I get less respect than a null-grav puffball?

"Because she's cuter." Matthew ducked out of the way easily as Jason took a lazy swing at him, turning heels-over-head in the antechamber and swerving to land on his feet again. Kim Sue used the opportunity to jum p on the chair and Matthew. Rodriguez shook his head. "So. Give me the Lombardi briefing."

"We've accelerated again and been joined by an attack carrier group, the Lexington," answered the young gunner, turning to his control board. A video panel activated high on the wall of the chamber and zoomed in on a nearby dark patch of space. A major portion of the fleet had been assembled in this one area of space, and the tension seemed to thicken with every moment.

"Commodore Goering finally told us why we're here," Matthew continued. "It's something about the Venusian trade port — that's our destination now."

"Are we going to fight the Venusians? The brass must be out of their minds!"

"No. . . not directly. ." explains Matthew. He stood, drifting over to the gunnery panels. Typing around Kimberly Sue's paws, he brought up a television broadcast recorded earlier that day.

". . . after tracing through four different levels of corporate ownership it was discovered that the primary owner of Colony Cylinder T3 is actually the Venusian Bank. As with the other T series cylinders, T3 was originally designed as a trading port. CEGA naval intelligence announced today that they have obtained proof that the facility is being used to conduct trading in prohibited weaponry and advanced artificial intelligence. A SolaPol cruiser is already en route to deal with possible Edicts violations, and CEGA has announced that they will be apprehending the arms dealers as soon as possible.

"The Jovian Confederation has come to the defense of T3, stating that the colony is in open space and that CEGA has no jurisdiction over its inhabitants. Jovian forces are converging on T3 to prevent another annexation, as seen earlier this year at. . ."

"So it's a race, then." commented Rodriguez. "I better check the calibration. Do you have the readouts from the last tests?"

* * *

"My dear Commodore Goering. . ." the regional director's cold voice cut through the air like a knife. "You must recognize that we simply have no wish to retain the services of someone who doesn't follow the rules."

"What is it that you want from me?" snapped Goering. The director's statement was double edged, as was everything the man said. He was publicly referring to the smugglers, of course, but Goering knew it was also meant for him. Damn his illness, and damn the debt. If his lungs hadn't filled with blood on that scout ship. . . if he hadn't gone to the Venusians for treatment. . .

"The same that you want," the cold voice replied, "to see that those arms dealers that were discovered are punished. They have already begun preparations to leave the colony."

"Damn and double damn." Goering cursed. He knew what was behind the concerned citizen act, of course. The real problems, by the Venusian's standards, was not that the terrorists had been dealing arms, but that they had been caught doing it.

Goering's next words had been decided for him a long time ago. "Give me the coordinates. We're on our way."

* * *

"R-3, repeat Readiness Status 3," blared the intercom. The klaxon began to sound, blaring out its repetitive warning.

Immediately Kimberly Sue bolted out of the chair, heading for the hatch. As she scampered out fo the room, headed for her pressurized survival cage, Rodriguez brought the main laser array to standby. As the off-duty laser gunner, Matthew would be moving to man the point defense lasers.

"Readiness three. . ." Rodriguez mused to himself. That meant uncertainty — just keeping things ready in case they contacted the enemy. So the squadron was now hunting a moving target.

Only a few minutes later, the alarm changed tone: "R-5, repeat Readiness Status 5."

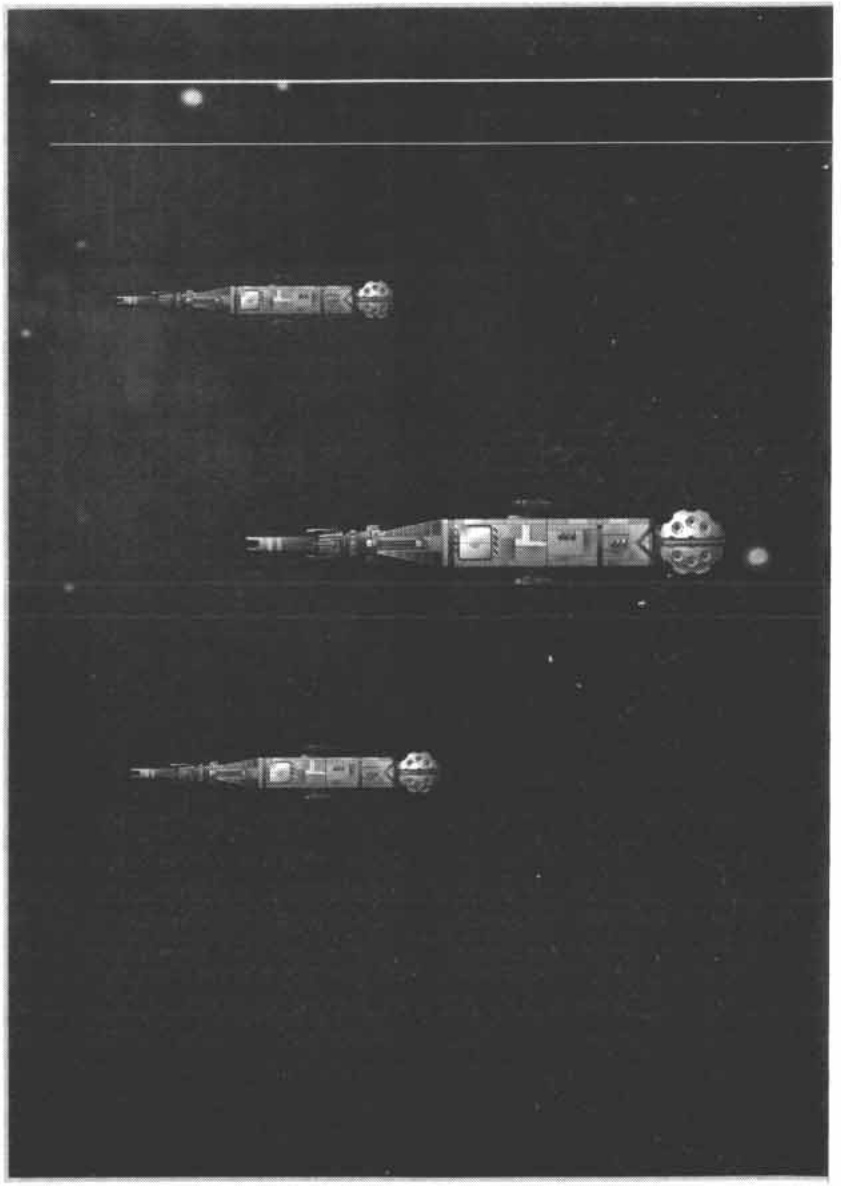
Rodriguez was pushed back into the seat as the engine began to gear up — two gees of acceleration were possible at full power. Now they were flying like the wind, and at R-5 they had to be heading into combat.

HYDRA-CLASS AREA DEFENSE BOAT

Area Defense Boat, Hydra-class (partial list)

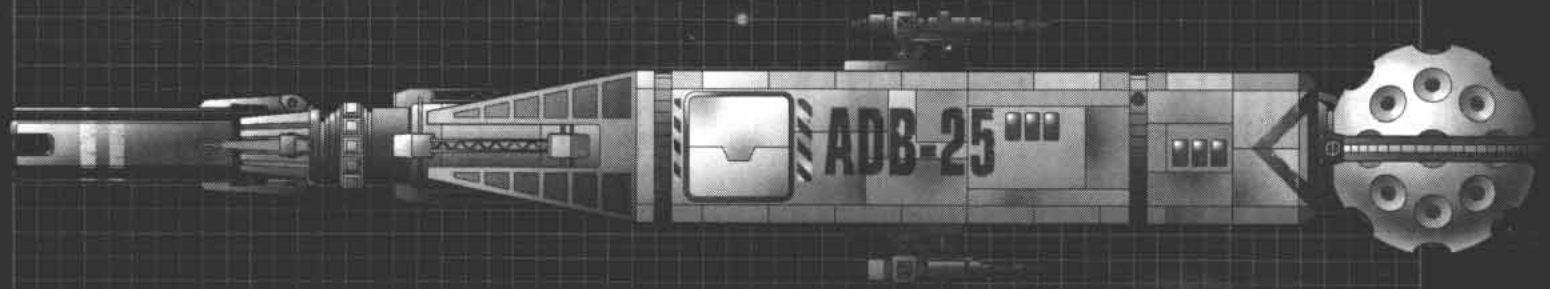
Name	Launched	Current Status
ADB-01 "Hydra"	June 5, 2205	Reserve
ADB-02	September 17, 2205	Earth orbital
ADB-03	December 3, 2205	Fleet 1
ADB-04	January 22, 2206	Training
ADB-05	March 3, 2206	Fleet 2
ADB-06	April 19, 2206	Fleet 2
ADB-07	June 5, 2206	Fleet 3
ADB-08	August 2, 2206	Fleet 3
ADB-09	September 19, 2206	Fleet 4
ADB-10	November 12, 2206	MIA, April/2207
ADB-11	December 25, 2207	Fleet 5
ADB-12	February 20, 2207	Lost, December/2209
ADB-13	April 2, 2207	Fleet 6
ADB-14	May 28, 2207	Fleet 6
ADB-15	July 15, 2207	L-4
ADB-16	September 25, 2207	L-5
ADB-17	October 11, 2207	Fleet 1
ADB-18	November 28, 2207	Lunar orbit
ADB-19	January 13, 2208	Fleet 1
ADB-20	March 9, 2208	Fleet 1
ADB-21	April 27, 2208	Earth orbit
ADB-22	June 18, 2208	Fleet 2
ADB-23	July 22, 2208	Fleet 2
ADB-24	August 25, 2208	Training
ADB-25	September 16, 2208	Fleet-3
ADB-26	November 22, 2208	Evaluations
ADB-27	December 18, 2208	On loan to Exo R&D
ADB-28	January 15, 2209	Fleet-3
ADB-29	February 17, 2209	Fleet-4

21 more ships in class

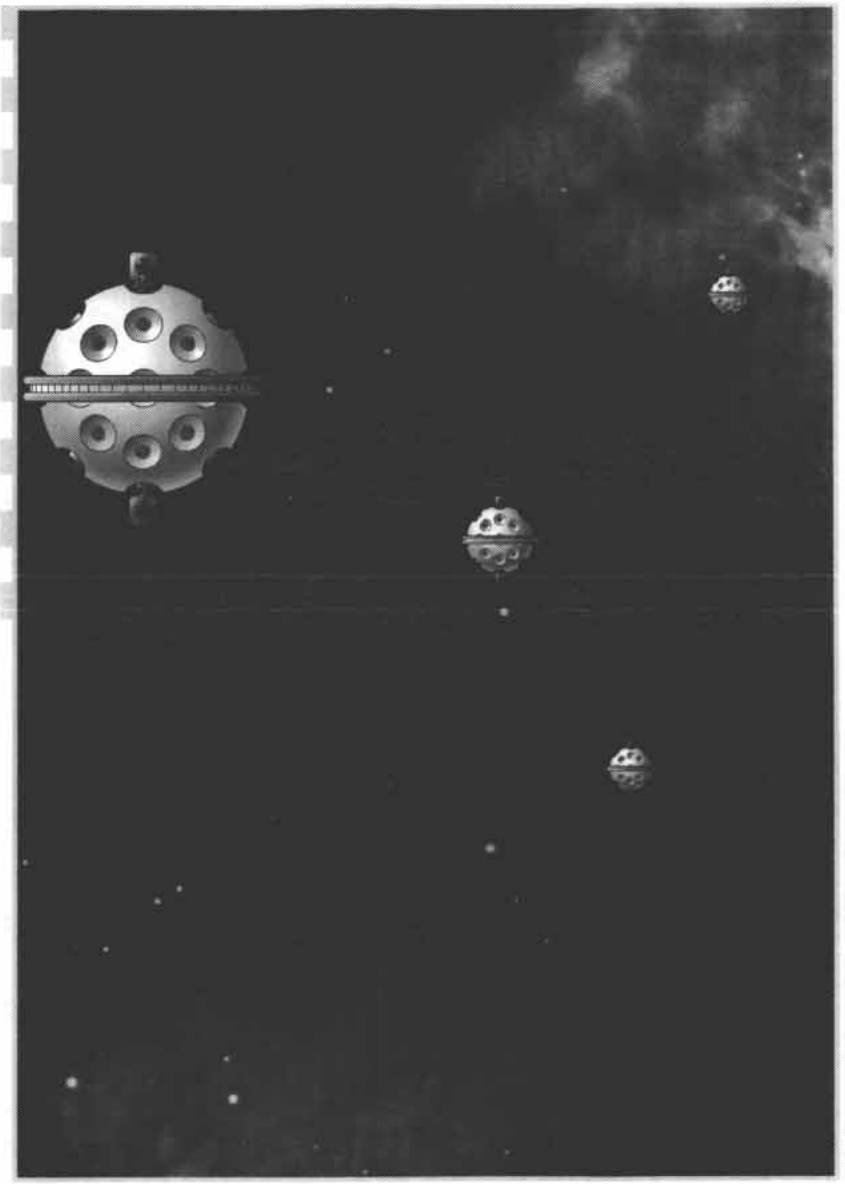


HYDRA-CLASS AREA DEFENSE BOAT

CSS ADB-25 (2213 CONFIGURATION)



Concerned with the Jovians' successes in the field, CEGA created a ship specifically to face exo-armors and fighters. Low in cost and practically mass-produced, the Hydra-class vessels help curtail the threat of small craft attacks. It is one of the most straight forward warships ever built, consisting of little more than plasma drive and crew facilities — all there is needed to bring the area defense laser array in action.



▶ 2.1 OVERVIEW

Area Defense Boats, or ADB, are very much what their name says. Smaller than corvettes, these ships are so puny the Admiralty doesn't even award them individual names. The "gun club," the nickname given to CEGA officials supporting warships armed with heavy weapons, is a great supporter of this type of vessel since the greatest threat to their great battlewagon are attacks by small, nimble craft such as exo-armors and fighters. The ADB is thus a blessing for the gun club.

While lacking any single major anti-ship or anti-installation weapon system, the Hydra-class ADB is very much designed around ship-class weaponry. The ship's design is entirely centered around the area defense laser array. Although the latter is less focused than the similar system carried by the Jovian's Alexander-class ship, the ADB has a higher energy output per pulse overall. The laser array is capable of incredible rates of fire and a faster reaction rate as well, making it a major deterrent to nearby hostile auxiliary craft operations.

A high performance plasma drive takes up the entire aft end of the boat. A relatively recent development in engine design, the ADB's plasma drive reduces the ability of fast enemy craft to control the engagement by offering a high level of thrust with a reaction mass reserve far greater than any exo-armor or fighter's. Even if the attackers choose to break off the assault, the ADB is guaranteed to catch up over time, should the fleet admiral decides that pursuit is a valid strategy.

Being small in size, the ship can be built in the less well-equipped secondary naval construction yards. This leaves the primary yards free to continue building major warships. Additional secondary yards are being contracted periodically to build additional area defense boats; on a war footing, a new addition can be made to the navy every two weeks.

▼ 2.1.1 Capabilities

Area defense boats are based on a straightforward concept that nonetheless requires challenging technologies to implement successfully. To break up fast moving attacks, the Hydra-class is fitted with a high performance engine and a rapid fire laser array. The boat must also, however, still carry the necessities for interplanetary travel. All this must be in an affordable package to allow the Navy to field large numbers of ADBs, since attrition rates for such a tiny ship are likely to be large.

The ship is smaller than a corvette, and there are limits to what can be placed inside the tight hull. The specialized mission of the craft allowed designers to avoid wasting mass and volume carrying unnecessary general purpose equipment. In fact, the Hydra-class' design work has led to whole new types of compact ship equipment usable on vessels with small crews.

The Hydra-class lacks any conventional warship turret. Originally, the ship even lacked any Kinetic Kill Cannon. Two mounts have since been retrofitted for basic defense purposes. Other approaches for improving the ships firepower have been considered, but the systems are so tightly integrated that they have proven impractical.

One of the concepts implemented early on was to include a pair of fighters onboard the ADB, which would be used to hunt down wounded or crippled enemy units. Unfortunately, the idea was doomed to fail. Carrying fighters in crates is simple enough, maintaining them on a battle-ready status is much more difficult without the proper facilities.

The only small auxiliary craft found on an ADB are usually just a pair of work pods and another pair of robot repair units. A launch is carried for conducting in-flight transfers, since full-size shuttles consume to much of the ship's precious cargo area to be carried. Due to the size of the ADB, it can dock with nearly any ship that a shuttle could land in.

The ship's real purpose is to bring the area defense laser to bear. Although the first prototypes were behind schedule, the laser array is now keeping up with hull production. Laser power generators run parallel to the ships spine, where they feed into a cluster of targeting lenses; all this machinery is interwoven with cooling and heat transfer pumps. The end result is bursts of photons with so much energy that even an exo-armor will explode on contact.

A minimal marine complement is present, along with the traditional two exo-suits. The marines are primarily there to provide security for boarding or when the boat is docked. The exo-suits also allow the marines to recover escape pods and take prisoners. Without any EVA specialist in the standard crew roster, the marines are called upon to fulfill those responsibilities.

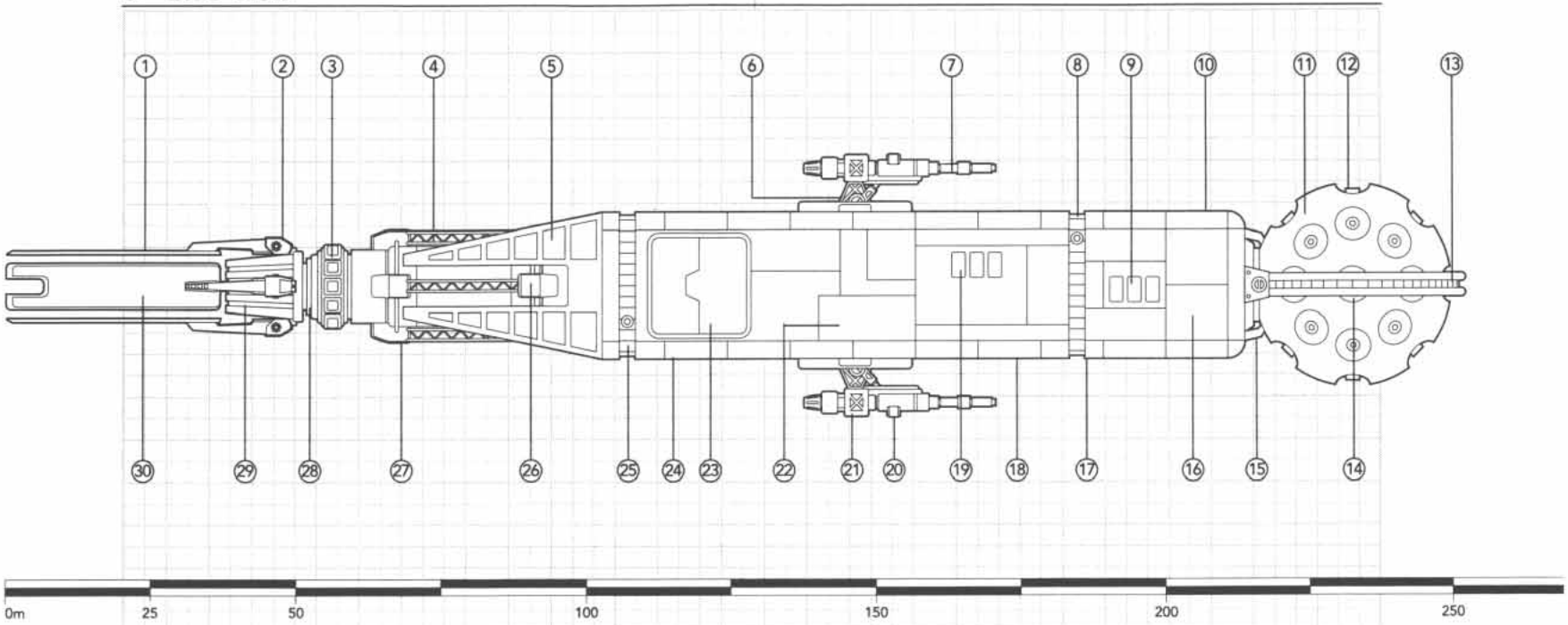
Theoretically, there is sufficient life support and maintenance resources to keep the ship out on maneuvers for long periods of time. Crews report that the lack of larger workshops makes them dependent on other vessels for major repairs. Since the ADB primarily operates as an escort to such as vessel, this is not seen as a major liability by the Admiralty.

▼ 2.1.2 Operational Role

Aircraft of the twentieth century were constrained in their operations by the developments of surface-to-air weapons; the Area Defense Boat exists to provide the enemies of CEGA with a similar handicap. This is accomplished by destroying the enemy fighter craft directly or by shooting down their inbound missiles. As of this time, the six CEGA fleets each have six to eight ADB at their disposal, in addition to those assigned to orbital or Lagrange point defense. Due to their limited number, most fleets operate a few of their ADB alone. There will typically be two around the flagship, while others are assigned to escort operations or to guard docks important to the fleet. Plans also exist for area defense boats to escort friendly attack craft. The ADB's role in this case is to destroy any hostile sent out as interceptors.

▶ 2.2 SHIP SCHEMATICS

◐ Side View

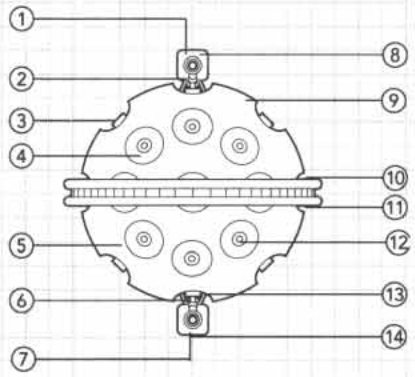


▼ Legend

1	Exhaust Collimators	11	Area Defense Laser Housing	21	Lower KKC Turret
2	Hinges	12	Area Defense Laser Emitter	22	Aft Directional Sensor Array
3	Fusion Core	13	ADL Support	23	Main Bay Door
4	Mounting Truss	14	Rotation Servo Joint	24	Main Bay Housing
5	Heat Sink Array	15	ADL Mounting Bracket	25	Rear PDS Emitter Array
6	Articulated KKC Gun Mount	16	Directional Sensor Array	26	Engine Connector
7	Topside KKC	17	Blast Panel	27	Engine Mount/RAM Hardpoint
8	Forward PDS Emitter Array	18	Laminated Composite Armor	28	Transfer Collar
9	Escape Lifeboat Covers	19	Midship Lifeboat Covers	29	Exhaust Coils
10	Powercell Housing	20	Beam Pointer Housing	30	Drive Heat Sink

2.2 SHIP SCHEMATICS (CONT.)

Front View



Legend

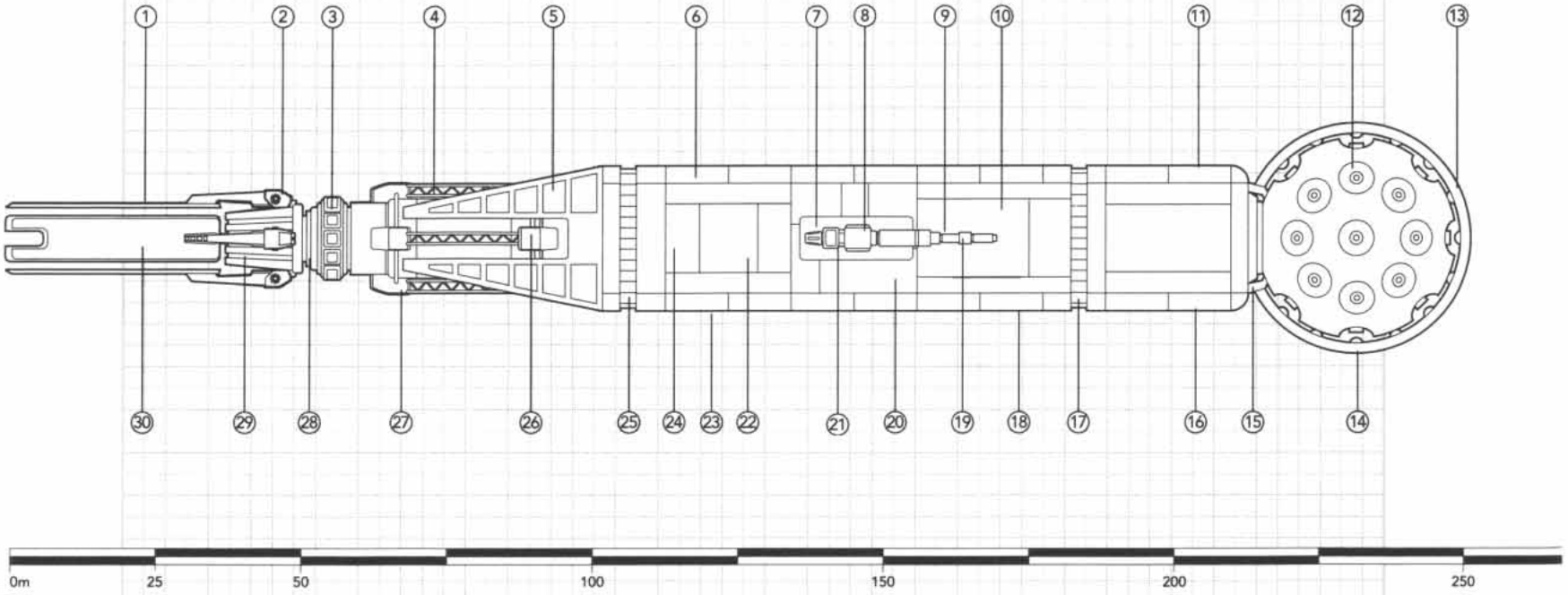
1	Upper KKC Turret
2	KKC Turret Hardpoint
3	Area Defense Laser Emitter
4	Emitter Mounting Plate
5	Emitter Ring Array
6	Lower KKC Turret Hardpoint
7	Lower KKC Turret
8	KKC Armored Housing
9	Emitter Maintenance Seal
10	Structural ADL Support
11	Rotation Servo Joint
12	Emitter Variable Lens
13	Composite Armor Plating
14	Beam Pointer Housing

Specifications

Name:	Hydra
Origin:	Central Earth Government & Administration
Manufacturer:	Various Shipyards
Type:	Area Defense Boat
Control System:	Bridge w/astronomical display
Length:	216 m (254 m overall)
Width:	25 m (40 m overall)
Empty Weight:	7,500Tons
Loaded Weight:	10,000 Tons
Main Drive:	1 x 20 MW
Secondary Powerplant:	1 x 4000 KW
Main Thrusters:	1 x 25,000,000 kg
Apogee Motors:	80
Acceleration:	2.0 g
Onboard Sensors:	Fire Control Radar, Infrared/ Ultraviolet, Lidar, Magnetometer, Microwaves, Motion Detectors, Radcounter, Search Radar
Fixed Armament:	PDS, 1 x Area Defense Laser Array, 2 x KKC turret
Additional Armament:	n/a
Defensive Systems:	Mag Screen
Equipment:	Escape Pods

▶ 2.2 SHIP SCHEMATICS (CONT.)

◐ Top View

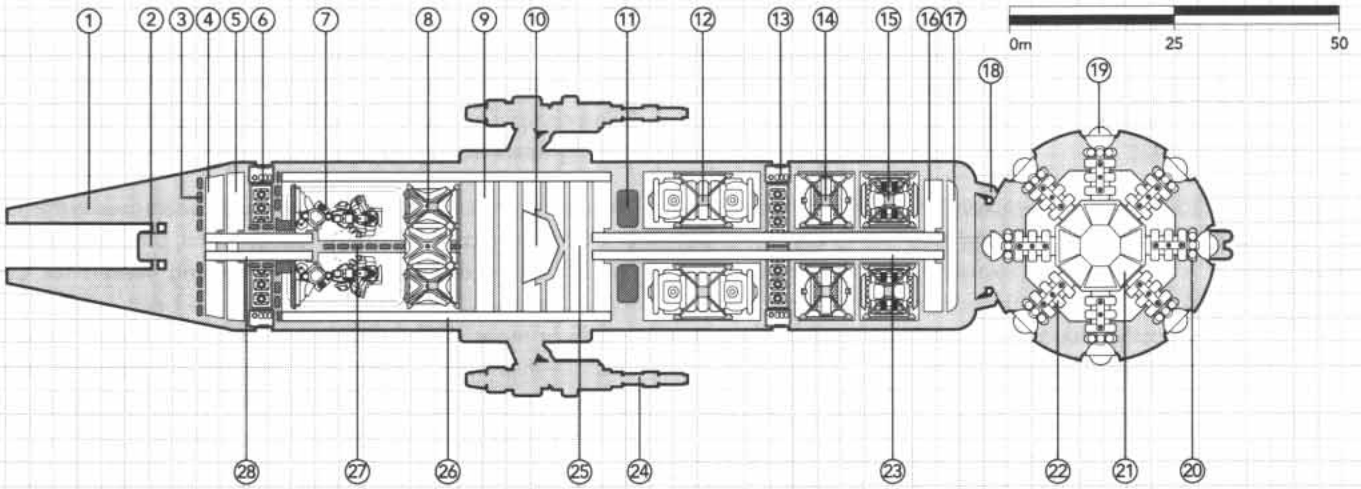


▼ Legend

1	Exhaust Collimators	11	Powercell Housing	21	KKC Housing
2	Hinges	12	Area Defense Laser Emitter	22	Upper Directional Sensor Array
3	Fusion Core	13	ADL Support	23	Main Bay Door
4	Mounting Truss	14	Rotation Servo Joint	24	Main Bay Housing
5	Heat Sink Array	15	ADL Mounting Bracket	25	Rear PDS Emitter Array
6	Segmented Armor Panel	16	Directional Sensor Array	26	Engine Connector
7	Articulated KKC Gun Mount	17	Forward PDS Emitter Array	27	Engine Mount/RAM Hardpoint
8	Beam Pointer Housing	18	Laminated Composite Armor	28	Transfer Collar
9	KKC Barrel	19	Trajectory Corrector Array	29	Exhaust Coils
10	Blast Panel	20	Loading Door	30	Drive Heat Sink

2.2 SHIP SCHEMATICS (CONT.)

Cutaway View (Forward Hull)



Legend

1	Drive Section	16	Forward Engineering Deck
2	Engine Mounting Bracket	17	Service Deck
3	Mag Screen Generators	18	Laser System Support Strut
4	Engineering Deck	19	Area Defense Laser Emitter
5	Workshops	20	Primary Flush Tanks
6	Aft PDS Laser Array	21	Power Distribution Node
7	Shuttle Bay	22	Main Laser Tube
8	Bulk Storage	23	Service Elevator
9	Crew Quarters	24	Kinetic Kill Cannon
10	Bridge	25	Commons
11	Life Support Node	26	Lower Decks Service Elevator
12	Superconducting Batteries	27	Structural Spinal Truss
13	Forward PDS Laser Array	28	Engineering Service Lift
14	Gas Storage		
15	Heat Exchangers		

▶ 2.3 HISTORY

Even before the battle of Elysée, there has been a growing rift in exo-armor and general fighter craft technology between Earth and her wayward colonies. While the recent introduction of advanced CEGA exo-armors closes this gap somewhat, the next generation of vehicles from the other nations of the solar system have yet to emerge. In order to provide a stable base to defend its operations against them, the CEGA Navy introduced the area defense boat in 2205.

Almost immediately, the "fighter savvy" members of the Admiralty opposed the idea. They insisted that the funds would be better spent in more advanced exo-armor prototype development projects. While ADBs have gained some acceptance among pilots since then, mostly through their actions in combat, they are still disliked by many senior commanders.

Relations between the various services were smoothed extensively by a cunning move of rear-admiral Jernan Godunof, who early on made an ADB available on loan for assisting the then-fledging CEGA exo-armor research program. The boat, ADB-02, was used extensively to test tactics and counter-tactics, and both the new exo pilots and the boat crew have been learning the abilities and limitations of the Hydra-class. Rumors were soon heard that the tests were endorsed by the fighter brass solely to embarrass the ADB program by the number of times an attacker has been able to strike a practice target despite the ADB's efforts, but Godunof's staff made every effort to quell them. Over time, the ability of the ship to significantly reduce the threat of small craft attacks for long periods of time was just too important to pass up or even hide very long. A boat could stay on station for weeks on end, while friendly exo-armors on the same duty would have to rotate constantly for maintenance and crew relaxation.

While various programs to increase the firepower of the area defense boats have failed, there is promising work in other design concepts. Ideas include using them as launch platforms for drones and heavy anti-ship missiles. The idea of producing monitors is also gaining in popularity: monitors would be boat-sized vessels with moderate to heavy anti-ship guns, but with only minimal interplanetary mobility.

Tabloids have recently reported that a stealth boat is rumored to be under development. The same reporters also claim that the vessel is armed with nuclear warheads and includes an edict-violating computing system. The baseless sensationalism is strangely making boats more popular.

The appearance of yet more area defense boats means that CEGA is dedicating serious energy to its naval program. Boats on Lagrange and orbit duty serve as training vessels for CEGA; roughly a third of the naval personal have been on a boat for a month or more. A comedian once joked that after staying on a boat, even a Bricriu seems luxurious. As the numbers of ADBs increase to be more than the number of high value targets to be protected, they may be used for long range patrols as well.

Engagements fought so far have been against only limited numbers of exo-armors. Most of these engagements were against ill-trained pirates. That a true evaluation of the ADB against large numbers of trained exo armor is needed may be the main reason why there is a boat assigned to the exo research program.

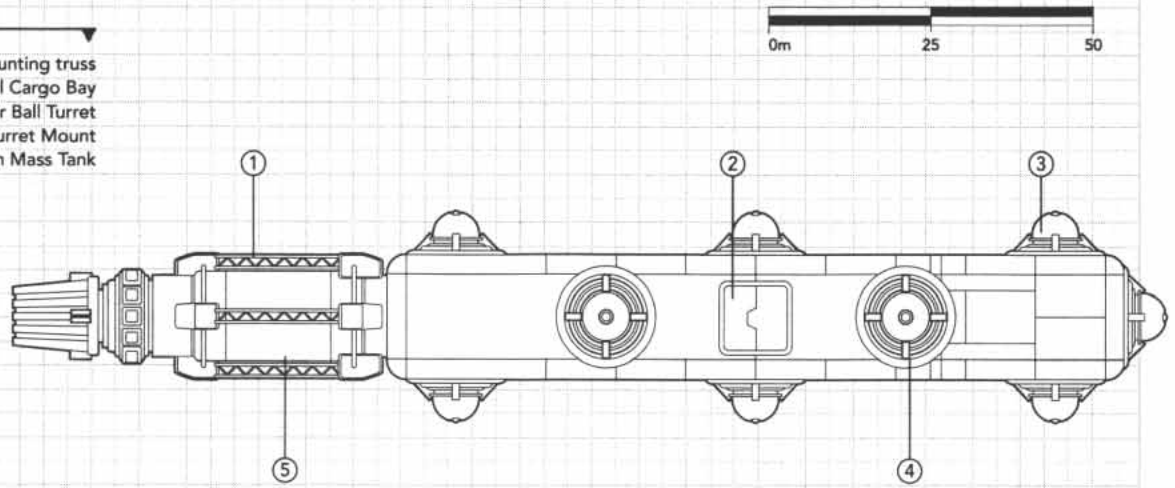
Since the ADB is expected to be a unit with a high attrition rate, no formal naming ceremony is planned for the boats. An unofficial name is often painted on the outside of the hull by the crew; such names mirror those painted on World War Two bombers. The entertainment industry has picked up on this trend and has paid some captains to paint a reference to an actor or film as their boat's cartoon. Normally, this would not be possible under the current rules, but due to internal strife in the Admiralty, boats come under different regulations than a full sized warship. This gives some leeway to the individual captains, which do not hesitate to use it.

CSS HYDRA

Hydra-class Vessels, 2205-2206

Legend

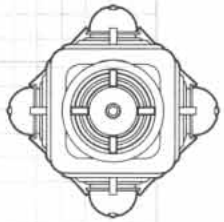
1	Engine Mounting truss
2	Small Cargo Bay
3	PDS Laser Ball Turret
4	Articulated Turret Mount
5	Unarmored Reaction Mass Tank



Only one vessel of the original configuration was ever produced. Work on the all important "spider lens" system encountered production difficulties due to the need for a nano-gravity facility to grow the crystal lenses in. Microscopic defects in the lenses were causing them to overheat, bubble and then burst. An unguided laser beam could end up damaging the boat itself. Rather than delay the launch, the number two competitor was allowed to submit a counter-proposal. Their system consisted of several enlarged classic ball turret PDS emplacements.

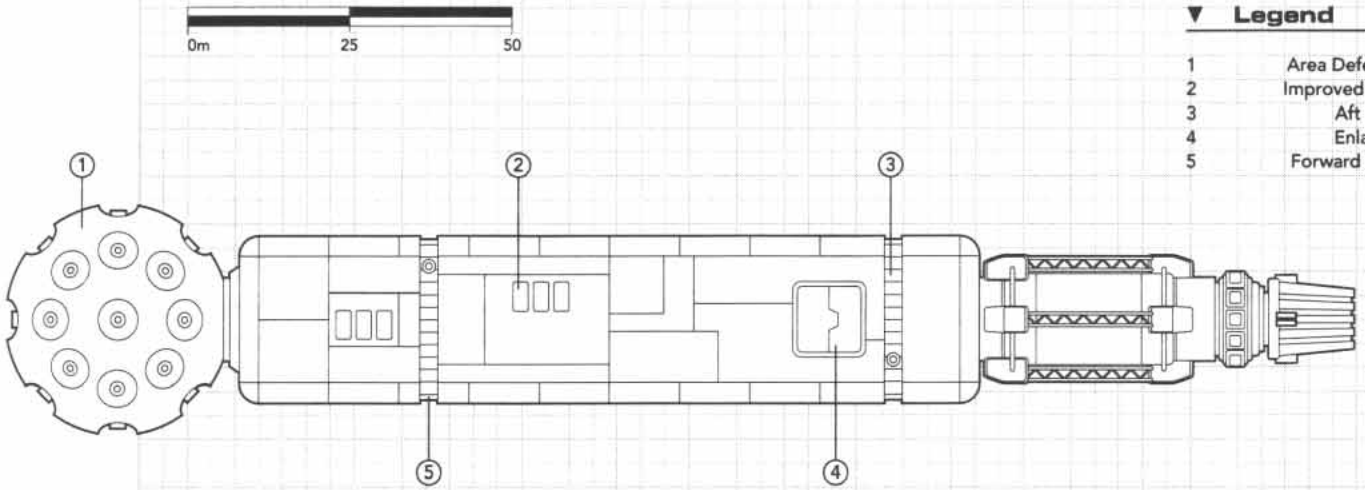
While it was very effective for missile defense, it proved insufficient against vehicles. In one evaluation, a towed target took over twenty hits with only minor damage. The manufacturer pointed out that this was extreme range firing, something that the design wasn't originally called for. This early system also required a reduction in the size of the cargo bay in order to have room for the aft portion of the system.

The appearance of the large PDS bulges was soon picked up on by the military press. After an air show host introduced the prototype vessel as the "Hydra," the Navy decided to christen her as such. Of all the ADBs in service, only the "Hydra" wears an official name on her bow.



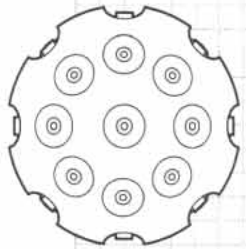
▶ CSS ADB-04

◐ Hydra-class Vessels, 2206-2207



▼ Legend

1	Area Defense Laser Array
2	Improved Escape Vehicles
3	Aft PDS Laser Array
4	Enlarged Cargo Bay
5	Forward PDS Laser Array



Improvements in manufacturing methods led to purer crystal growths, which in turn allowed the area laser lenses to be produced in micro rather than nano gravity. The boat design swung back to the original concept of a single large laser assembly. The hull was also enlarged to handle all the additional heat management equipment. Interestingly, the firm that had produced the large PDS system was later sub-contracted by the laser manufacturer to provide the software. Two years later, the two companies merged to become Hydra Engineering.

ADB-02, nicknamed the "Pirates of Penzance," is on permanent duty around Earth, its polar orbit allowing it to operate as a spy satellite for CEGA. Officially, the vessel is there to prevent the use of ICBMs which may be equipped with Edict violating warheads.

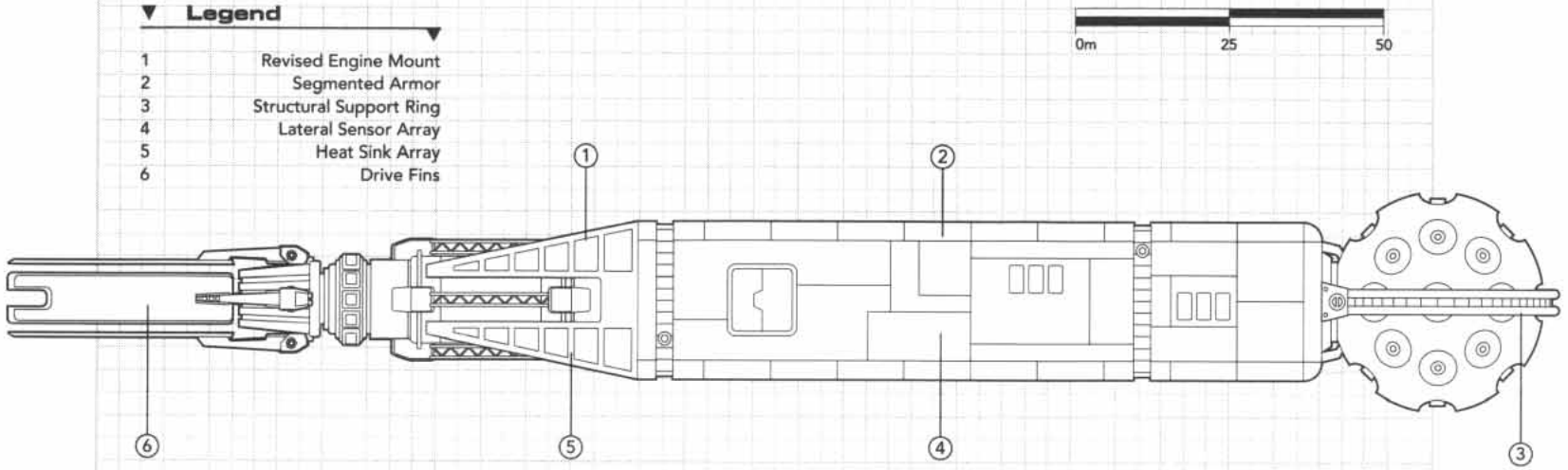
ADB-04, "Volleyball Valley," serves as a laser gunnery school ship. During one part of the gunnery course, a barrage of Velcro covered volley balls are sent tumbling through space towards a net. After the thirty seconds of allotted laser firing time, the student-gunner must do a space walk to recover every ball not destroyed.

CSS ADB-08

Hydra-class Vessels, 2206-2208

Legend

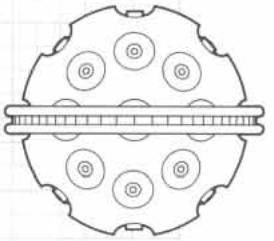
1	Revised Engine Mount
2	Segmented Armor
3	Structural Support Ring
4	Lateral Sensor Array
5	Heat Sink Array
6	Drive Fins



With the laser and crew facilities revised, the ADB development team turned to improving the propulsion systems of the boats. Advances in the sporting vessel industry where incorporated to develop the longer fin system, better able to dissipate heat. The extra radiator surfaces also assisted in controlling the heat produced by the laser system.

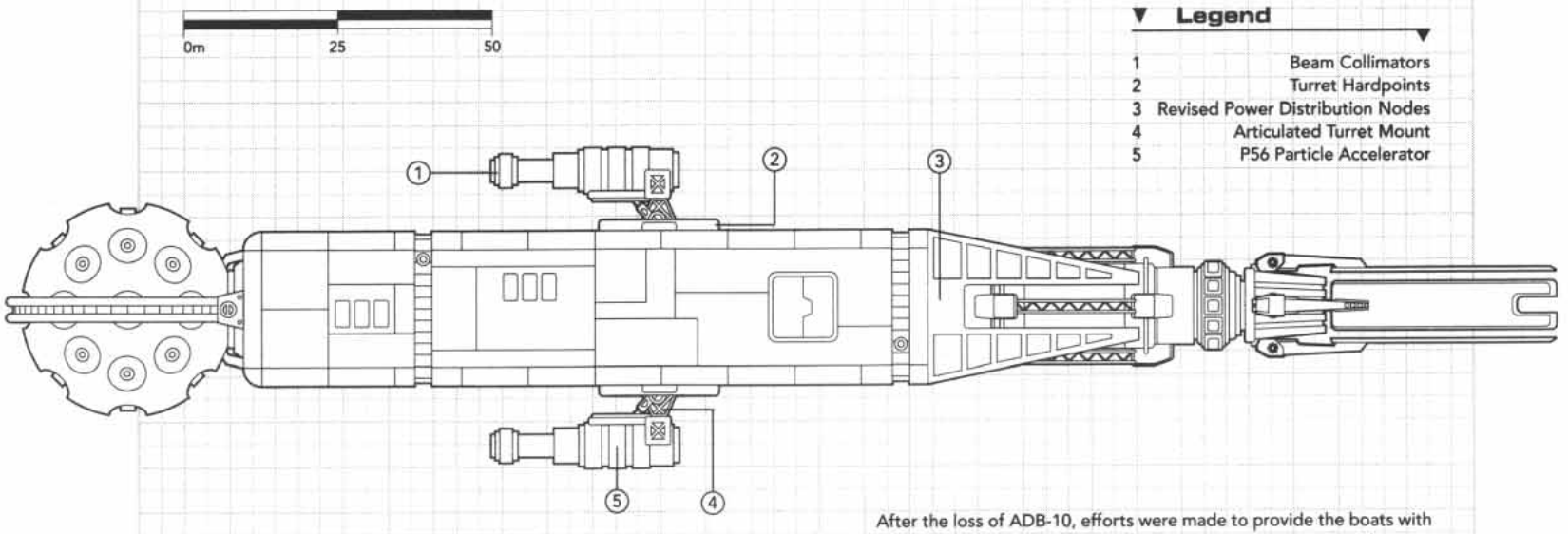
Appearing above is ADB-08, "Tennessee Truckers," whose first captain came from the Tennessee area of North America. When the boat was launched, the fleet was already outbound for a patrol of the Asteroid Belt. A few vital parts on the flagship had broken down; ADB-08 was used as an express courier to deliver the materials.

ADB-10, "Martha's Kitchen," was lost while serving with the fourth fleet. A Tengu and ADB-10 were conducting wargame exercises when a distress beacon was detected in a nearby area. The carrier stayed behind while its exo-armors and "Martha's Kitchen" moved forward to investigate. By the time the Tengu arrived on the scene, there was no sign of ADB-10. Wreckage of the CEGA exos was found along with what appeared to be an armor panel from an Alexander-class destroyer. It is suspected that ADB-10 was hijacked so that her laser array could be studied, but nothing was ever proven.



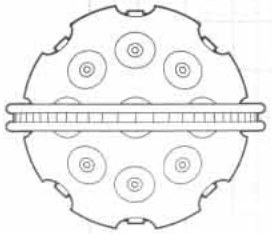
▶ CSS ADB-17

◐ Hydra-class Vessels, 2207-2208



▼ Legend

1	Beam Collimators
2	Turret Hardpoints
3	Revised Power Distribution Nodes
4	Articulated Turret Mount
5	P56 Particle Accelerator



After the loss of ADB-10, efforts were made to provide the boats with actual anti-ship weaponry. The first attempt was to use particle guns, the idea being that the powerful generators of the laser could be used to supply the guns as well. While that part of the design was successful, it meant that the area defense laser would be unavailable to fulfill the ship's other role. Only four vessels were produced in this configuration; all have since been retrofitted with KKC weaponry.

"Black Fox," ADB-15, is one of the boats assigned to the L-4 Lagrange point. It operates as a safeguard against attacks targeting the colonies and space stations orbiting this point of gravitational balance. L-4 is also one of the major Hydra manufacturing sites, and ADB-15 is used by the CEGA navy to conduct live fire tests of new laser lenses.

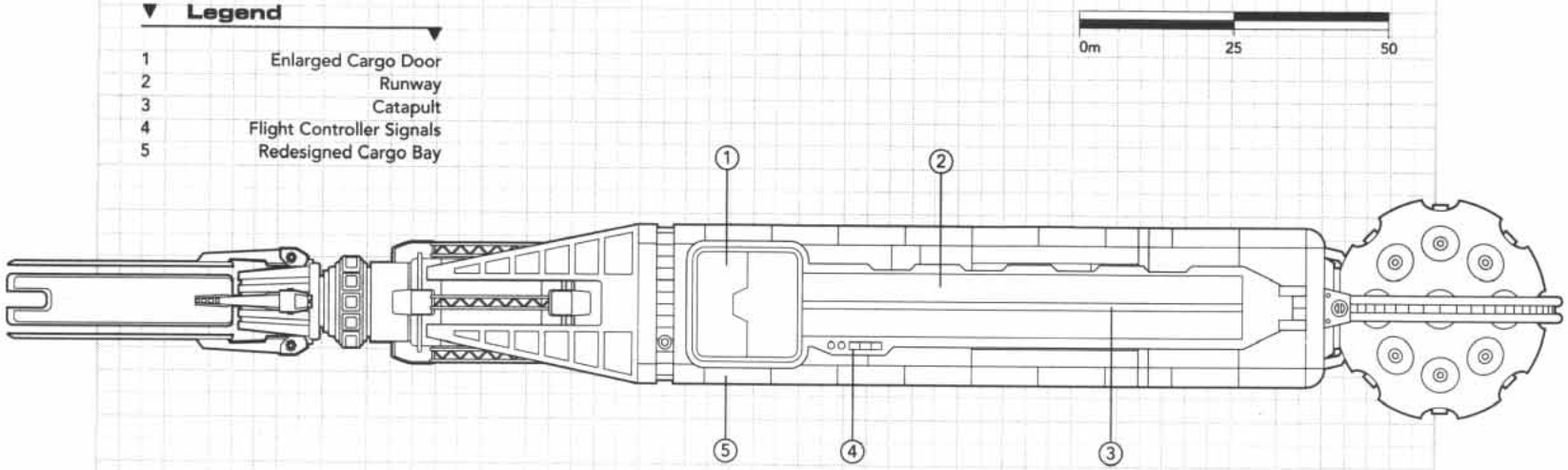
Starting with ADB-17, "Flagon Dragon," the fleets began to receive their second generation of area defense boats. These new ships greatly improved the deployment situation, for fleet commanders could now keep a pair with their main fleet while other ADBs were undergoing regular maintenance. Before this time, there were often gaps in ADB coverage due to the insufficient number of vessels in the field.

CSS ADB-21

Hydra-class Vessels, 2208 - 2211

Legend

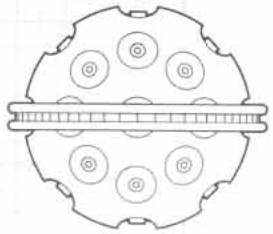
1	Enlarged Cargo Door
2	Runway
3	Catapult
4	Flight Controller Signals
5	Redesigned Cargo Bay



With the poor performance of the particle cannons, the ADBs were once again placed under tactical review. The cargo bay was enlarged and catapults added to the sides of the hull: the ships were to carry a pair of exo-armors to operate as forward scouts and mop-up crew. Unfortunately, the ADB hull is just too small to accommodate this additional load, and life support systems began showing signs of premature failure. It was decided afterward that the "exo on a boat" idea was getting away from the concept of specialized vessels. A few boats still retain their catapult but operate only a single exo-armor.

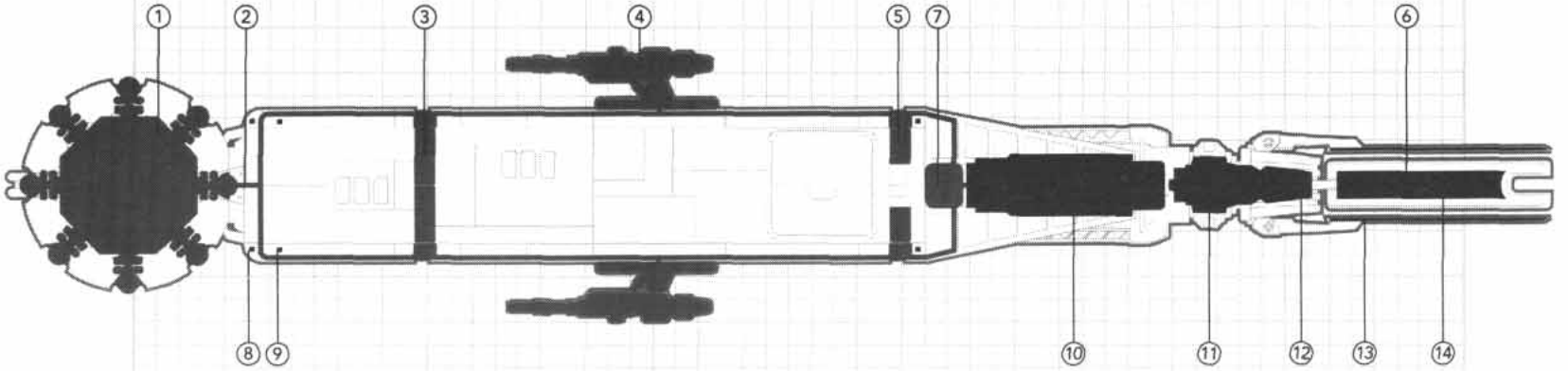
ADB-20, "Habitat Improvement," was a replacement for the first fleet. Its arrival allowed the older ADB-02 to be transferred to Earth orbit duty. ADB-20 later encountered a violent miner group during a mission in the Belt, but only one exo was able to launch from the hangar — the other had become trapped behind storage crates.

ADB-21, "Maximum Impact," operates in Earth Orbit. The boat is used to train exo-pilots in emergency reentry procedures. Rumors say that ADB-21 is also used to launch spy satellites and commando raids.



▶ 2.4 SHIP SYSTEMS

◐ schematics



▼ Weapon Systems

1	*Area Defense Laser System*
2	Power Couplings
3	Forward Array, Laser PDS Cells
4	Kinetic Kill Cannons
5	Aft Array, Laser PDS Cells
6	Heat Sinks
7	Main Power Conduits

▼ Propulsion Syst.

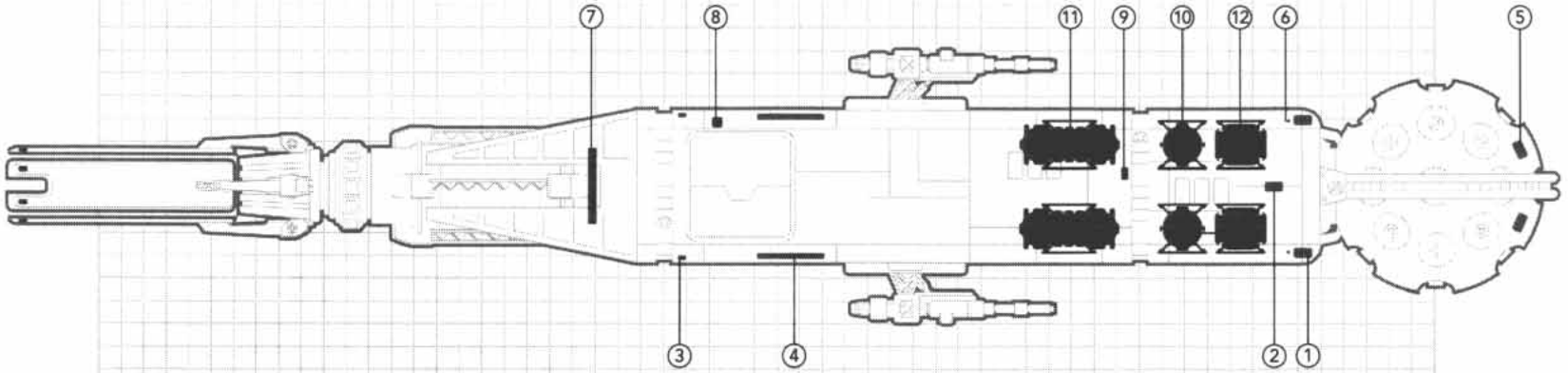
8	Plasma Arc RCS Cluster
9	Hypergolic RCS Thrusters
10	Reaction Mass Tanks
11	Plasma Combustion Chamber
12	Exhaust Collimator Coils
13	EM Power Generation System
14	Heat Sink

The hull of the Hydra-class is studded with long tubes filled with electronic gear and secondary piping. These tubes contain the systems that power and cool the laser beam generators used for area defense. Due to their tight confines, they are complicated to maintain, requiring skilled personnel to do the job.

Generating beams in rapid sequence is very hard on the equipment. The Hydra's laser system uses a gatling-like arrangement where each of the generating tubes fires in sequence at a single master lens. This lens then conducts the energy via fiber optics to the outer emitter array, the "spider lens" visible on the bow. As the next tube fires, the previously discharged one is given a fraction of a second to cool down and reset. This allows capacitors to recharge and the primary emission bank to stabilize. Spacing out the firing for the tubes reduces the joules per second heat transfer rate to more manageable levels.

2.4 SHIP SYSTEMS

schematics



▼ Sensor Systems

1 Docking Sensors
2 Microwave Pulse-Ranging Antennae
3 Shortwave Instrument Clusters
4 Phased Array Radar
5 Laser Ranging and LIDAR Emitters
6 Optical Sensor Cluster

▼ Life Support Syst.

7 Shield Generators
8 Hangar LS Systems
9 Secondary LS Nodes
10 Gas Storage
11 Superconducting Batteries
12 Heat Exchangers

Crew quarters aboard the Hydra-class ships are spartan in their simplicity. Unlike other CEGA warships, the staterooms on a boat consist of little more than a wall-mounted sleeping berth and rows of storage lockers. This "cubby hole" design requires little volume, freeing large amounts for other, more mission-critical ship systems. Each crewmember is issued a sleeping bag which is stored away in the cubbies when not in use (asteroid prospectors use this technique when converting a vessel for exploration duty).

A further reduction in crew volume is achieved by using the ship's cargo bay as an exercise area. Every day, each shift assem bles there to do aerobics for fifteen minutes. ADBs have earned a reputation for being as cramped as the early primitive Apollo landers.

▼ 2.4.1 Area Defense Gunnery

The Area Defense Gunnery Room is a small, cramped chamber used to control the large area defense laser assembly. The single hatch to the room is located just under the chair, into the arc that the laser array cannot easily fire into. Procedures calls for the hatch to be secured at all time, but most gunners leave it open until combat.

The gunnery chair itself is mounted on a 3-axis rotational array to allow it to swing to any position. On the chair's arms, two sliding pad controllers slews the targeting reticule around. This will also slew the chair to keep the reticule front and center.

Information displayed on the wallscreens is limited to that needed for fire control purposes. A simple keypad interface allows access to various secondary controls, such as those which determine how much is displayed on the main screen. Maintenance procedures are run through the keypad as well to test the gun systems.

Priority targets are identified by the bridge station. A solid square appears around the projection of these targets, while a corner-only marker appears around low priority targets. All targets appear with a marker vector line showing relative thrust. As the defense system is laser-based, little or no lead is needed.

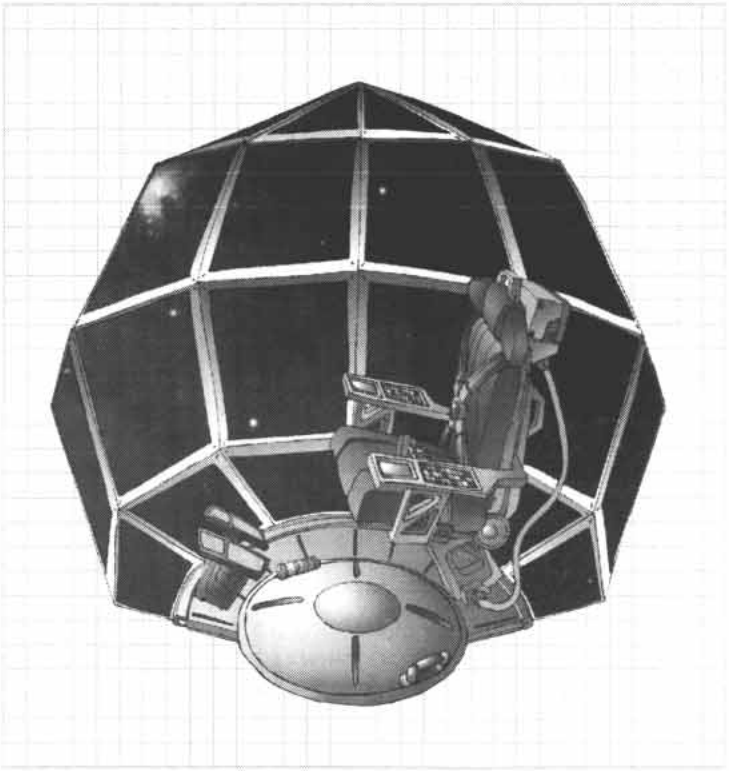
Ships fitted with side-mounted kinetic kill cannons use a similar system. One of the most obvious differences is the presence of a leading target crosshair to take into account the slower flight speed of the KKC slugs. The crosshair is where the gunner has to aim to hit the target if it continues on its current trajectory, rather than its actual position.

Gunners are expected to wear their duty space suits when operating the gunnery station. The cramped confines of the room precludes the use of a standard life support pack; instead, the chair includes both port and tubing for plugging the spacesuit into the ship's local power and life support grid.

▼ 2.4.2 Boat Bridge

Boat-sized vessels cannot afford the volume needed for a full-sized spherical control center. Instead, they use a reduced four-person design. This smaller size allows a boat to still benefit from the concept of the astronomical display.

The ship's captain is in the center. The chief gunner station, the chief engineering station and a dual role navigation/helmsman station form a triangle around him. Other functions, such as a communication and astronavigation, are supervised from small work stations located just outside the bridge itself.



The chief gunner can access all of the weapon controls from the bridge. Normally, the bridge's gunnery station is used solely to prioritize targets and for overall situational awareness. Actual aiming of weapons is typicaly conducted through the local fire control systems near the weapons themselves.

Engineering interfaces with the ship's computer to run programs, do maintenance reviews and supervise damage control. In combat, the chief engineer may attempt various workaround repairs without leaving the bridge. He may also directs the damage control parties, which are led by the watch officers.

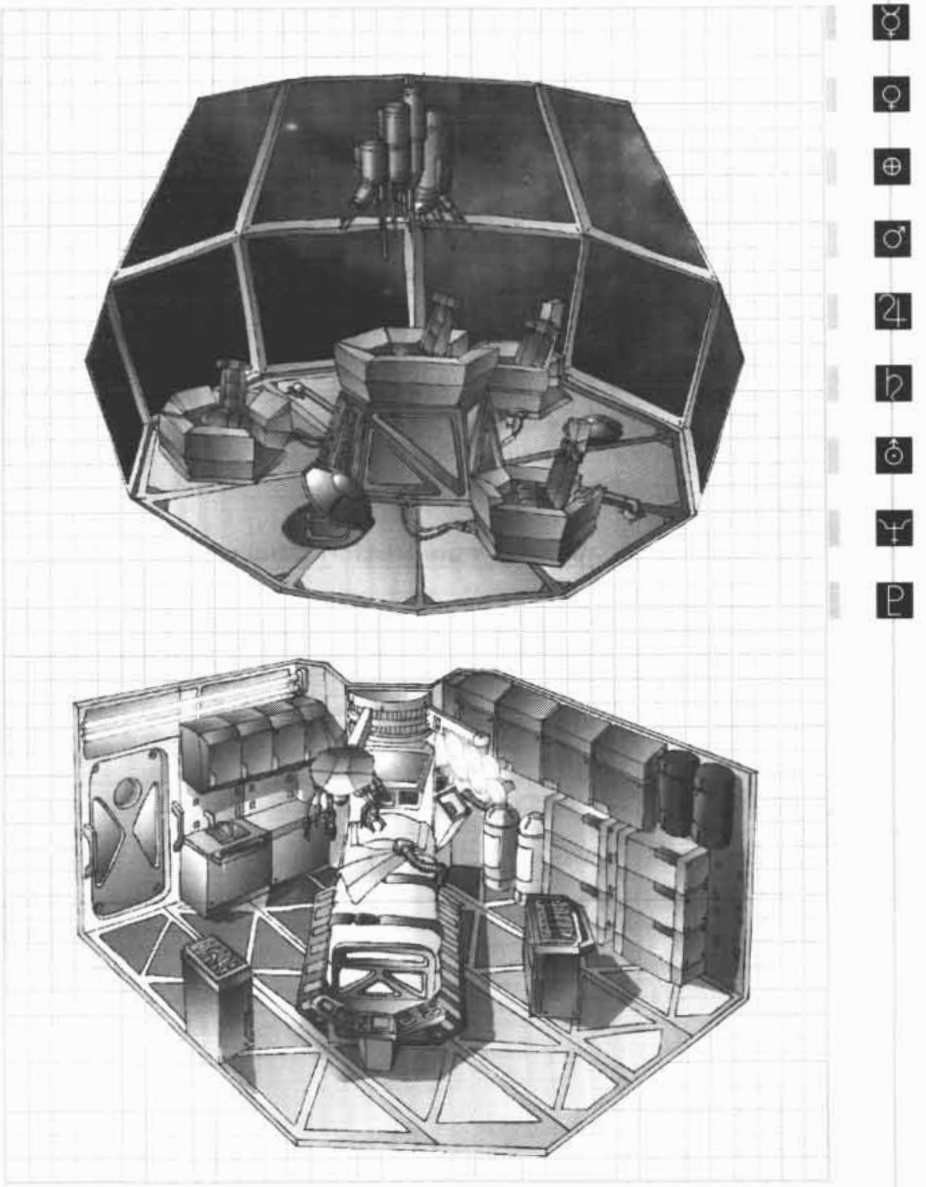
The ship's pilot has full control of the vessel from the navigation and helm station. Constant coordination with gunnery is important, as the ship's maneuvers will move its firing arcs around. New courses may be plotted onto the spherical display for review by the captain prior to them being initiated.

Various data feeds are projected on the datascreen that form the walls and ceiling. In combat, the system functions as a giant head-up display, including target identification, range and a symbol showing the object's relative velocity. Each individual station has independent displays for more detailed information.

▼ 2.4.3 Sick Bay

Cramped conditions are commonplace on a boat. A boat's sick bay is thus a masterful arrangement of medical equipment. Everything has a place. Symbols on cabinet doors identify what items are to be kept inside. This allows medics to readily find items in an otherwise unfamiliar sick bay.

Micro-gravity conditions create many challenges to traditional medicine. Aside from combating muscle and bone degeneration, space medics have to cope with fluid properties. Under gravity, blood can be easily drained — not so in micro-gravity, where it will float away. Suspended vacuum hoses scoop up the blood as it leaves the patient before it can get into the equipment.



▶ 2.5 SHIP PERSONNEL

An Area Defense Boat has a very small number of crewmembers. The list below is almost the bare minimum for properly running a military interplanetary spacecraft, grouped under a small number of departments; Operations under the captain and the watch officers, Gunnery under the chief gunner and Engineering under the chief engineer. A small detachment of marines is present, who double as EVA specialists.

The boat's "captain" is often a lieutenant or lt. commander who is given the title of "acting captain." Watch officers for boats are either a junior lt. or an ensign; the chief gunner and chief engineer are almost always ensign. There are cases where the latter two are warrant officers being considered for promotion into full officer ranks.

Crew Organization Chart

Captain	
Senior Watch Officer	
Watch Officer	1
Sensor Specialist	2
Communication Specialist	2
Pilot/Navigator	2
Steward	1
Computer Specialist	1
Chief Gunner	
Laser Gunner	2
KKC Gunner	2
Laser Specialist	2
PDS Specialist	2
Chief Engineer	
Engineer	4
Bosun	2
Marines	4

▼ 2.5.1 Interview with a Lieutenant

Name:	**Susan McRae**
Rank:	**Lieutenant**
Current Assignment:	**ADB-17**

"Boats are an excellent place to get command experience. With boats and corvettes being the most numerous vessels in the fleet, you should look at one of them as a stepping point for your career. Personally, I feel an ADB is a better career move. A lieutenant is the normal rank of a boat's captain. We are given the title of 'acting captain' for the duration of the assignment.

"An ADB is sometimes used to escort a high value target. Expect to interact with commodores and admirals on a regular basis, then. Other captains know you are a junior, but you are still the one in charge of the boat! When you show them that you can be relied upon, maybe you can hope for them to request you as a personal aide. Due to the numbers of officers out there, getting an active command for a large ship requires both an excellent record and political support.

"Being the commanding officer on a boat is a whole lot better than being a department head. If you are good at running one department, you risk that being all you do for the rest of your life. Not so with a command job!

"One thing I have noticed is that no one has done a live test of the fleet tactics. There have been lots of wargames and simulations but we haven't had a major tangle with an enemy fleet. Our counter-tactics are based on an enemy using our tactics. I have the feelings the Jovians have the same problem. We both expect the other to realize that our own tactical doctrines are the best."

2.5.2 Interview with an Area Gunner

Name:	David Smith
Rank:	Chief Petty Officer
Current Assignment:	ADB-20

"Extensive testing is the first thing that happens to you before you enter boot camp, and the first thing when you get out. The results show them the trends in your physical abilities. It gives them an idea of what to do with you. While I showed excellent hand-eye coordination, they weren't satisfied with my agility. A lot of us gunners are like that, close but not enough to be a pilot.

"That has led to fierce competition between gunners and pilots. During practice, we tend to fire on the same target trying to get the hit that scores the kill.

"The control room for the defense system is a one-man chamber. Since there are two gunners on the ship, one of us gets stuck with checking the coolant and focusing systems during battle. It 's really weird the first time you take the chair for a battle drill. You keep spinning around with laser fire blazing all across the heavens.

"Larger battles become challenging for defense work. If the enemy is out in the open we can just use standard saturation techniques to ensure the target is hit. If an exo gets in too close, like to use a plasma lance, we can't do that. While the laser is designed to shoot down exos, it could damage the very thing we were sent to protect. You've got to aim just right.

"Still it's definitely an exciting job. When you're all that stands between a missile barrage and a passenger liner, you know you have to be fast. "

2.5.3 Interview with a Navigator

Name:	Natasha Krump
Rank:	Warrant Officer
Current Assignment:	ADB-08

"You can call me a navigator if you wish. On a small ship like the Hydra, I'm also the pilot. We get called helmsmen too. Having someone perform double duty saves on the size of the bridge and the crew quarters needed. Helmsmen come from a variety of backgrounds. Some of us are shuttle pilots while others, like myself, were commercial navigators. It's a good position to get into.

"Why? Well, from here you have several different career paths to look at. I have been studying exo maneuvering techniques quite a bit since my arrival. This helps us catch any intruder in our space. My real goal though, is to become a flight traffic controller on a carrier. A boat is a great way to learn about exos, both friendly and hostile. You don't get much call for interplanetary charting on a boat. The ship you are protecting almost always dictates what thrust, and thus what trajectory, can be implemented.

"My space time is almost up now. I'm hoping to transfer to one of the orbital colonies. Harbor traffic control is another good step for me. Knowing how to get our ship to an exo or getting an exo into our dock will be what makes carrier captains want to have me on their crew. If you plan things right, getting time on a boat will really move you along.

"I will be glad when that happens. You wouldn't believe how tight things are on a Hydra. Seems like everywhere you go you are bumping into someone. Sometimes the only way to avoid people is to shut yourself up in a maintenance crawlway."

▶ SORTIE

The ship decelerated with a shudder, and Rodriguez saw the storm gathering. A number of boosted transfer vessels were pulling away from the trading colony. The only things fast enough to catch them were exo-armors or an ADB, but exo-armors just didn't have the staying power to pace something like that. A handful of marines had come on board from the *Iwo Jima*; eight in the large Minotaur space-combat exo-suits, and eight in the man-killer Kobalts. Chances were that Goering was saving them for an attack on the colony.

As they closed on the first vessel, a cascade of missiles blossomed out of the launchers, appearing on the sensors like a display of fireworks. Yanking the chair around, Rodriguez panned laser pulses across their path. Exploding globes seemed to mark the end of that attack, but another wave was coming on fast. Saturation fire had the best chance of blasting through, but he had to track the missiles still coming at him.

Two missiles were coming in from either side. A green cross hair appeared on the one on the left; that would be Matthew on the point defense system. Slamming himself to the right Rodriguez tore a pulse of laser fire into the other missile. He gave himself a second to take a deep breath after the explosion fizzled, trying to drain some of the tension from his screaming muscles.

A small turret on the transfer vessel was swinging his way. The only armament on it was a communication laser; while intended to carry messages across the solar system, it could still damage a warship. Energy lanced forward, burning a streak down the side of the Hydra-class boat.

Kinetic Kill Cannons on the wings gave an angry reply. On his viewscreen Rodriguez could see the tactical markers showing the paths of other slugs as they flew from his ship to the transfer vessel. The arms smugglers made a clumsy attempt to stop their flight, their PDS in shield mode.

He could feel his chair lurch to stay facing in the same relative view. The boat was swinging the engine around for a braking maneuver, calculated to keep the laser in the line of fire. Lining up on the transfer vessel's engine, Rodriguez let go with a brilliant chain of laser fire. Intended to track rapid exo-armors, the system was unforgiving on the sluggish civilian craft. Like a slashing sword, the burst cut the engine in two. The ship flared briefly as containment was lost in the fusion core, and then the fires vanished, smothered by the cold emptiness of space, leaving behind only a charred hulk.

* * *

Shipman Douglas glanced across the room as he reached for his maser rifle. Darlene winked at him as she closed the hatch of her Minotaur suit, its large rounded shape striking in the compartment packed with humanoid Kobalts.

"Target thrusters disabled," shouted the ensign in command. "Straight over and inside. Piece of cake. Aut Pax Aut Bellum all the way, boys and girls!"

Douglas sighed as he closed the Kobalt's visor over his face. The ensign was a fresh recruit on his first tour. The kid had enough connections to start on a Constantinople; in a couple years he would probably be commanding the whole exo-suit company, with only one engagement under his belt. Douglas and Darlene and the others would be the ones who actually won this battle, but the kid would get all the credit. Somehow it just figured.

The target vessel was revealed as the airlock slid open. A shot from the ship's comm laser showed she still had some fight in her. Douglas quickly scanned the target, tapping his thrusters forward to clear the bay as he did so.

"Great. . ." Darlene shouted over the radio, "the point defense is live too."

The ensign cut in sharply. "If you can see the problem, then take it out! Too much chatter!"

Darlene's barrel-shaped suit swayed back and forth as the point defense tried to lock on. Her rifle flashed a shot off through the void, and a ball turret buckled inward, spewing debris. The rest of the turrets swiveled to lock on. A shot slashed her exo-suit, releasing a cloud of vapor.

"Damn" Darlene cursed, "Fuel tank ruptured. Port thrust out. Gotta abort."

Blasting his exo-suit's thrusters forward, Douglas slammed into the outer hull of the hostile. The turrets were busy, tracking the other marine suits. Raising his hatchet up high, Douglas felt the weapon's ultra high vibrations make his armor sing. Holding onto the hull with his free arm, he slammed the ax along the vessel's hull, splitting it with a downwards lunge. Pushing himself over the gash, he lined up a grenade bundle and dropped it in.

Quickly ducking back, Douglas both watched and felt the explosions going on inside. Each grenade in the bundle had been launched in a different direction and would bounce several times before detonating. They were timed to detonate at slightly different times as well, to maximise the damage potential. Debris and someone's helmet blew out of the vessel, making the hole even bigger. With a second swing of his blade, Douglas tore out a large chunk of the damaged hull.

Unable to cancel all her momentum, Darlene smashed into the side of the vessel a few feet away. Grabbing onto the hull as best she could, she managed to get the Minotaur moving and dove through the hole Douglas had made.

"That's the stuff!" shouted the ensign. "Straight in and. . ."

A laser blast from the point defense systems raked the ensign's Kobalt. Three puncture holes appeared on its surface; Douglas swore, watching the shots — everything seemed to be happening in slow-motion. In a Kobalt, penetrating hits meant pilot hits. A Minotaur grabbed the suit and pulled it towards the breach.

Douglas pulled himself in, only to bump into the back end of Darlene's suit. She was pinned between the twisted walls of the damaged corridor.

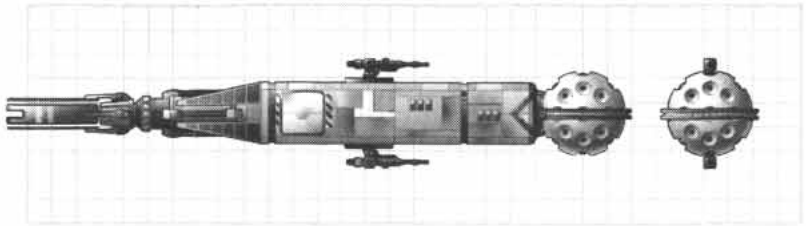
"Sorry" replied Darlene, "seems I'm stuck. Can't push my way out, either."

Swinging the hatchet again, Douglas split open an inner bulkhead. Squeezing through it, he emerged in the corridor beyond.

A large barrel was waiting for him. The Decker Pouncer was covered in scratches and dents from the grenade blast, and the pilot was none too happy. Douglas felt the shot hit him square in the leg. He faltered, and fought the consuming pain as a shot flew in from behind him and cooked the Decker where it stood.

Sliding down against the wall, a thought slipped, carefree, through Dougals' mind. "Arms dealers. . . of course. . . they would have. . . their own. . . arms."

Darlene reached out a hand and caught Douglas' hummer hatchet as it floated free. Smashing it against the walls, she managed to widen the opening enough. In a few moments, she had cut her way into the ship's bridge. Her blood hot, she could barely contain herself when the crew put their hands in the air to surrender.



▶ Hydra-class Area Defense Boat

▼ Overall Data:

TV: 80,000	Off. TV: -	Def. TV: -	Misc. TV: -	Cost: 17 M	Indv lemon dice: 3

▼ Movement Data:

Mode: Space	Combat: 10 (1.0g)	Top: 20 (2.0g)	Maneuver: -3	Range: 3,000 hrs	ReMass: 2,500 BP

▼ Sections:

1 x Main Hull	1 x Area Defense Laser Housing	2 x KKC Turret
1 x Drive		

▼ Off & Def Systems

1 x Point Defense System (main hull)	6 x Kinetic Kill Cannon (turrets)	1 x Area Defense Laser (forward housing)

Section: Main Hull

▼ Main Data:

TV: 31,000	Off. TV: 8,000	Def. TV: 2200	Misc. TV: 80,000	Cost: 3.1 M	Indv lemon dice: 3
Crew: 24	Actions: 5	Sensors: 0/4 km	Comm.: 0/15 km	Fire Control: 0	Type: Early Prodc.
Hull Size: 50	Default Size: 36	Base Armor: 40	Light: 40	Heavy: 80	Overkill: 120

▼ Movement Data:

Mode: Towed	Combat: -	Top: -	Maneuver: -	Range: 3,000 hrs	Re. Mass: -

▼ Perks & Flaws:

Name	Rating	Game Effect	Name	Rating	Game Effect
Autopilot	-	Lvl 1 pilot	Reinf. Crew Comp.	-	Absorbs first two "Crew" hits
Backup Sys	3	Comm, Fire Con, Life Sup, Sensor	Satellite Uplink	-	x1000 Comm range
Computer	4	CRE 0, KNO 0, PP 4	Cargo Bay	-	10,000m³
Ejection System	-	60 places	Reinforced Armor	10	Front
HEP: All	-		Sick Bay	4	Zero-Gravity Medbay
HEP: Radiation	4	Screen			
Life Support	-	Full			
Passenger Accom	-	8,000 m³			

▼ Offensive and Defensive Systems:

Qty	Name	Arc	DM	BR	ACC	ROF	Ammo	Special	MS	WC	AC
1	PDS (ranged)	T	x10	1	+1	6	inf	AM, Heat	15	7400	n/a
	PDS (shield)	FF	x20	M	+1	0	inf	Def., E-shield, Heat	3	75	n/a

▶ Section: Area Defense Laser Housing

▼ Main Data:

TV: 11,000	Off. TV: 31,000	Def. TV: 1000	Misc. TV: 4400	Cost: 11 M	Indv lemon dice: 3
Crew: 3	Actions: 3	Sensors: 0/4 km	Comm.: -3/10 km	Fire Control: 0	Type: Early Prodc.
Hull Size: 35	Default Size: 23	Base Armor: 50	Light: 50	Heavy: 100	Overkill: 150

▼ Movement Data:

Mode: Towed	Combat: -	Top: -	Maneuver: -	Range: 3,000 hrs	Re. Mass: -

▼ Perks & Flaws:

Name	Rating	Game Effect	Name	Rating	Game Effect
Backup FireCon	-	Absorbs first "FireCon" hit			
HEP: Radiation	4	Screen			
HEP: Vacuum	-	Sealed			
Life Support	-	Full			
Reinf. Crew Comp.	2	Absorbs first two "Crew" hits			

▼ Offensive and Defensive Systems:

Qty	Name	Arc	DM	BR	ACC	ROF	Ammo	Special	MS	WC	AC
1	AD Laser	T	x17	3	+1	4	inf	AD2, AM, Heat	10	18,700	n/a

▶ Section: KKC Turret

▼ Main Data:

TV: 3800	Off. TV: 7300	Def. TV: 250	Misc. TV: 800	Cost: 3.8 M	Indv lemon dice: 3
Crew: 3	Actions: 3	Sensors: -3/2 km	Comm.: -3/10 km	Fire Control: 0	Type: Early Prodc.
Hull Size: 15	Default Size: 15	Base Armor: 10	Light: 10	Heavy: 20	Overkill: 30

▼ Movement Data:

Mode: Towed	Combat: -	Top: -	Maneuver: -	Range: 1,000 hrs	Re. Mass: -

▼ Perks & Flaws:

Name	Rating	Game Effect	Name	Rating	Game Effect
Backup FireCon	-	Absorbs first "FireCon" hit			
HEP: Radiation	4	Screen			
HEP: Vacuum	-	Sealed			
Life Support	-	Full			
Reinf. Crew Comp.	1	Absorbs first "Crew" hits			
Weapon Link	-	All kinetic kill cannons			

▼ Offensive and Defensive Systems:

Qty	Name	Arc	DM	BR	ACC	ROF	Ammo	Special	MS	WC	AC
1	KK Cannon	L/R	x30	7	-2	3	300ea	AP	12	3800	12

▶ Section: Drive Module

▼ Main Data:

TV:	5500	Off. TV:	0	Def. TV:	770	Misc. TV:	80000	Cost:	5.6 M	Indv lemon dice:	3
Crew:	4	Actions:	4	Sensors:	-5/2 km	Comm.:	-5/10 km	Fire Control:	0	Type:	Early Prodc.
Hull Size:	46	Default Size:	18	Base Armor:	50	Light:	50	Heavy:	100	Overkill:	150

▼ Movement Data:

Mode:	Space	Combat:	23 (2.3g)	Top:	46 (4.6g)	Maneuver:	-3	Range:	3,000 hrs	Re.Mass	10000 BP

▼ Perks & Flaws:

Name	Rating	Game Effect	Name	Rating	Game Effect
Backup Sys.	-	Comm, Fire Con, Life Sup, Sensor			
Ejection System	-	12 places			
HEP: Vacuum	-	Sealed			
HEP: Radiation	4	Screen			
Life Support	-	Full			
Reinf. Crew Comp.	2	Absorbs first two "Crew" hits			

▼ Offensive and Defensive Systems:

Qty	Name	Arc	DM	BR	ACC	ROF	Ammo	Special	MS	WC	AC
-											

▶ Section:

▼ Main Data:

TV:	-	Off. TV:	-	Def. TV:	-	Misc. TV:	-	Cost:	-	Indv lemon dice:	-
Crew:	-	Actions:	-	Sensors:	-	Comm.:	-	Fire Control:	-	Type:	-
Hull Size:	-	Default Size:	-	Base Armor:	-	Light:	-	Heavy:	-	Overkill:	-

▼ Movement Data:

Mode:	-	Combat:	-	Top:	-	Maneuver:	-	Range:	-	Re. Mass:	-

▼ Perks & Flaws:

Name	Rating	Game Effect	Name	Rating	Game Effect
-					
-					
-					
-					
-					
-					
-					
-					

▼ Offensive and Defensive Systems:

Qty	Name	Arc	DM	BR	ACC	ROF	Ammo	Special	MS	WC	AC
-											
-											
-											
-											
-											
-											

▶ Section:

▼ Main Data:

TV:	-	Off. TV:	-	Def. TV:	-	Misc. TV:	-	Cost:	-	Indv lemon dice:	-
Crew:	-	Actions:	-	Sensors:	-	Comm.:	-	Fire Control:	-	Type:	-
Hull Size:	-	Default Size:	-	Base Armor:	-	Light:	-	Heavy:	-	Overkill:	-

▼ Movement Data:

Mode:	-	Combat:	-	Top:	-	Maneuver:	-	Range:	-	Re. Mass:	-

▼ Perks & Flaws:

Name	Rating	Game Effect	Name	Rating	Game Effect
-					
-					
-					
-					
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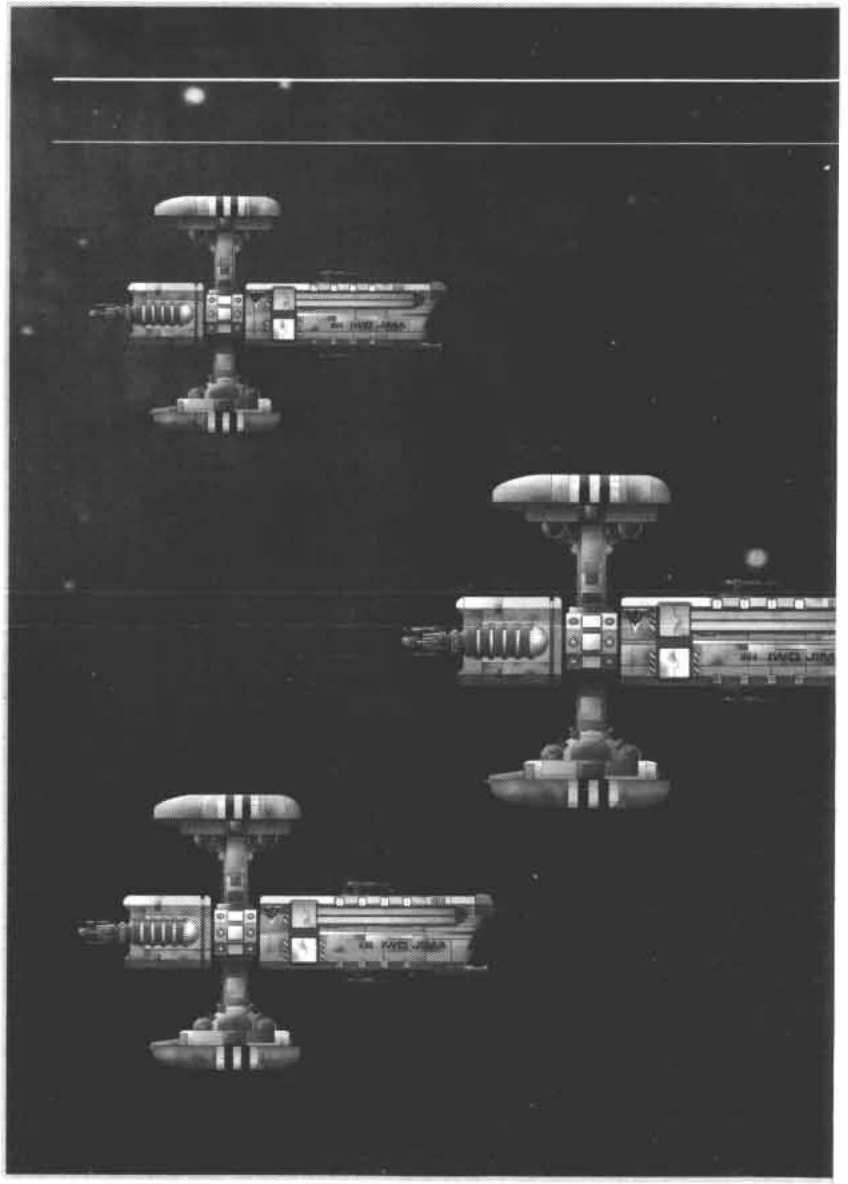
▼ Offensive and Defensive Systems:

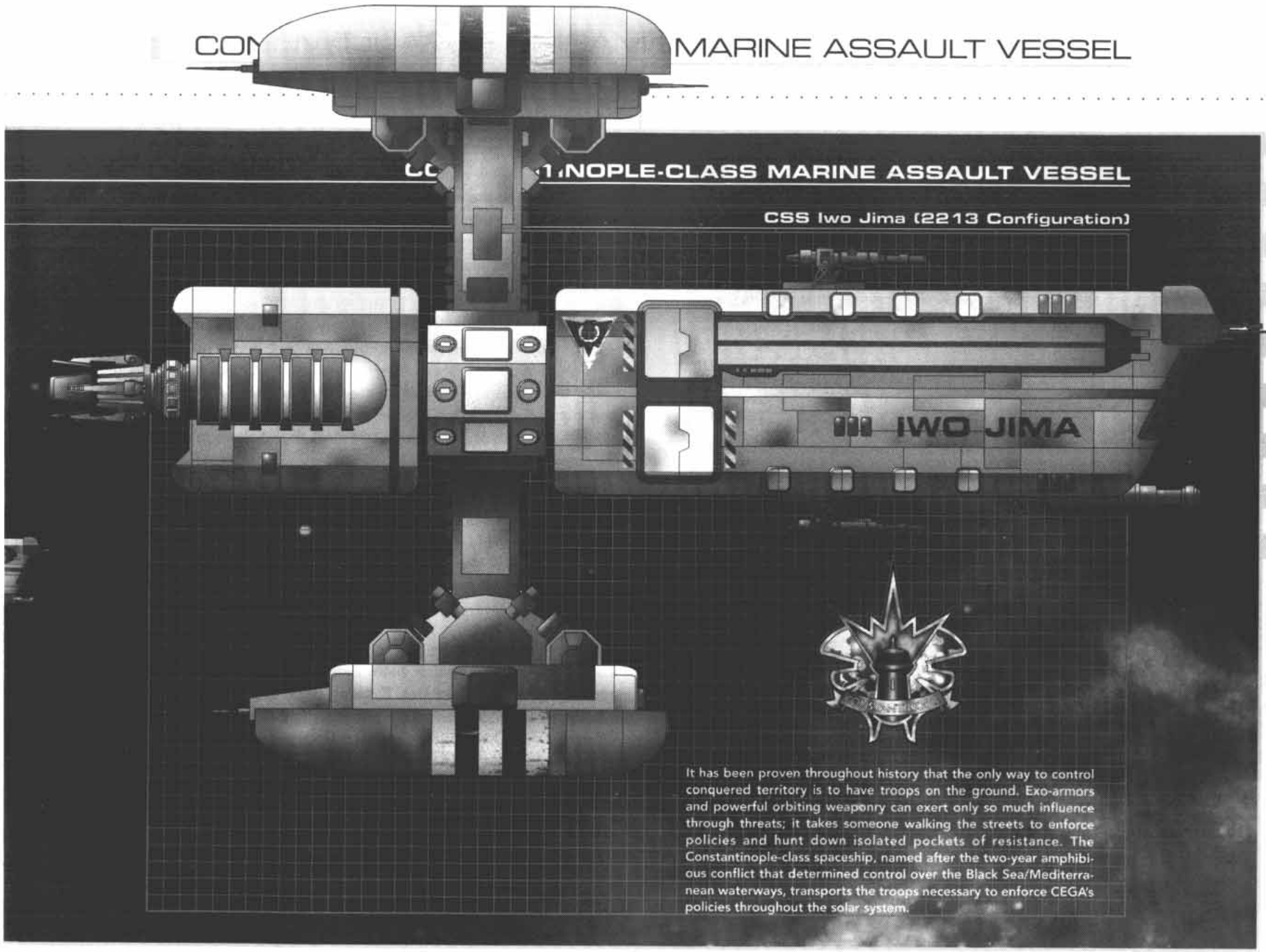
Qty	Name	Arc	DM	BR	ACC	ROF	Ammo	Special	MS	WC	AC
-											
-											
-											
-											
-											

CONSTANTINOPLE - CLASS MARINE ASSAULT VESSEL

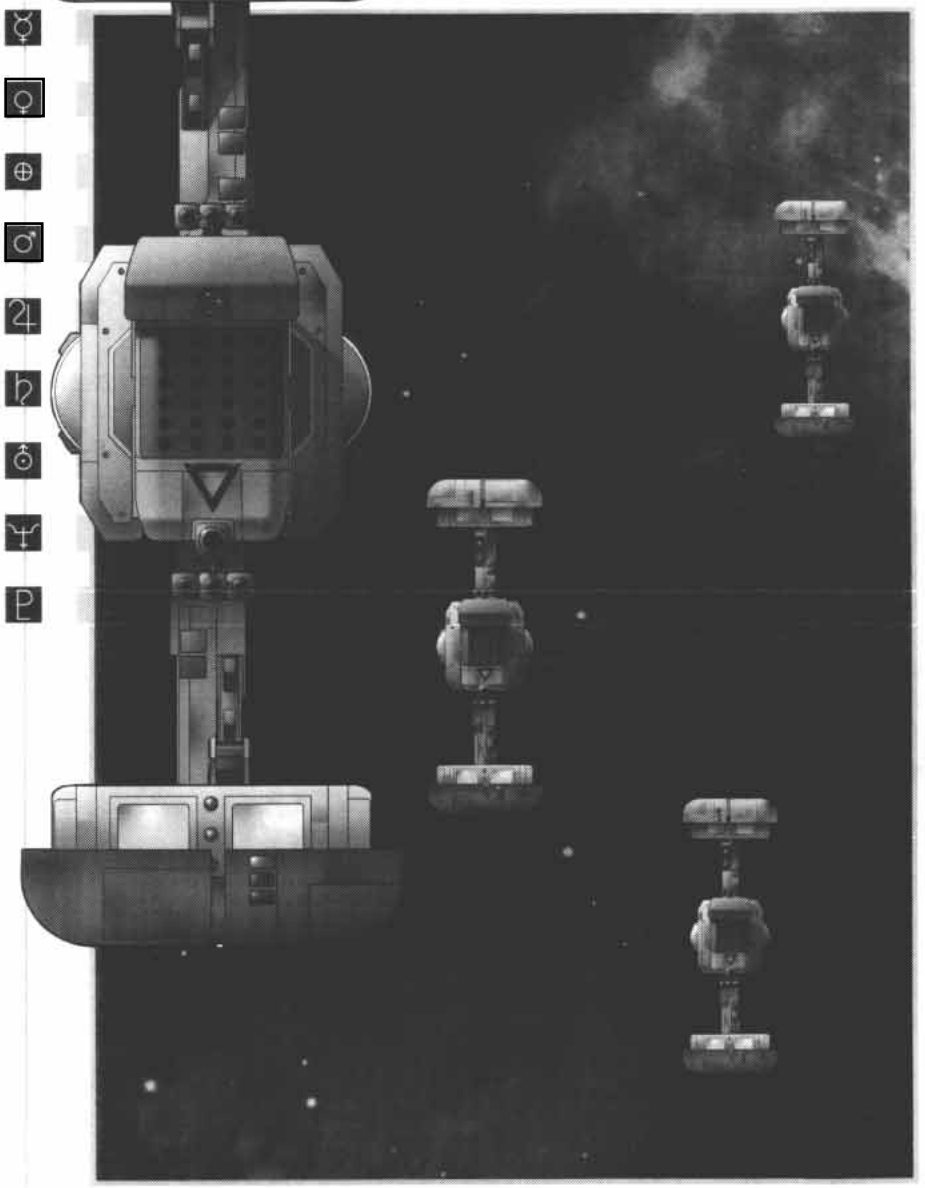
Marine Assault Vessel, Constantinople Class

Name	Launched	Current Status
Constantinople	Sept 6, 2192	Fleet 4
Normandy	June 6, 2194	Fleet 6
Falklands	August 7, 2195	Fleet 5
Quebec	May 9, 2197	Fleet 2
Inchon	Nov 22, 2198	Fleet 1
Guadalcanal	July 14, 2199	Fleet 3
Sea of Tranquility	June 30, 2205	Training
Gallipoli	April 18, 2208	Fleet 1
Jakarta	May 4, 2208	Fleet 2
Tientsin	Feb 25, 2209	Fleet 3
Iwo Jima	May 1, 2209	Fleet 4
Hastings	April 11, 2210	Fleet 5
Okinawa	April 14, 2210	Fleet 6





It has been proven throughout history that the only way to control conquered territory is to have troops on the ground. Exo-armors and powerful orbiting weaponry can exert only so much influence through threats; it takes someone walking the streets to enforce policies and hunt down isolated pockets of resistance. The Constantinople-class spaceship, named after the two-year amphibious conflict that determined control over the Black Sea/Mediterranean waterways, transports the troops necessary to enforce CEGA's policies throughout the solar system.



▶ 3.1 OVERVIEW

An historical review of naval power once concluded that "colonies attached to the mother-country afford therefore the surest means of supporting abroad the sea power of a country." This includes the commercial activities of a nation and the military might that ensures its safety, both of which rely upon the treatment they receive at foreign ports.

Marines are the means by which military influence is applied to the operation of these ports. A colony or port that is acquired through commercial means may be peacefully staffed; in other cases, the acquisition may be resisted or a previously supportive port may be seized by a hostile force. The latter cases require more than a passenger liner to transport the marines to where they are needed.

A Constantinople-class vessel is basically a very mobile ground army. In larger invasion operations, its troops operate as the vanguard. They can breach the outer line of defenses and secure a beachhead inside the enemy's perimeter. Once the target is secure, hordes of regular army troops can be safely deployed to the theater by regular transports.

The vessels themselves are named for famous amphibious or space assault operations, most of them dating back to the twentieth and twenty-second centuries. Drawing upon the history of marine forces enhance the CEGA space marines' pride in their calling and their already high morale. Like many such forces before them, the marines are "the first to fight," and remain justifiably proud of their reputation.

Each marine assault vessel, with its troops, is an independent invasion force. Ship-borne artillery, exo-armors and exo-suits all provide heavy fire support to the infantrymen who form the bulk of the assault. Transport shuttles, the ship's cargo bays, workshops and maintenance sections provide the logistic resources for the entire force.

▼ 3.1.1 Capabilities

Resources on board a Marine Assault Vessel can be divided into six general categories: infantry combat resources, heavy weapons fire support, artillery fire support, transport, deployment and logistics. They work closely together in order to ensure the success of a given mission.

The individual infantryman is still the basic unit of the marines. Soldiers need to be provided with rooms, meals, exercise areas, weapon lockers and practice ranges on board the ship. The practice ranges are enclosed hallways where non-lethal practice versions of weapons are used during specific drills.

'Heavy weapons support' is a general term that covers exo-armors and exo-suits, both of which bring a whole new set of weapons to the fight. The Wyvern Marine is the current exo-armor model used by the CEGA Marine Corps. The machine can carry a wide range of weapons, from bazookas to rapid-fire massdrivers to "hummer" melee weapons. Their primary purpose during battle is to screen the infantry from enemy armor forces.

Exo-suits are especially useful as highly mobile assault units. In many scenarios, the infantry will establish a defensive perimeter while the exo-suited forces launch attacks to destroy or capture vital targets like the bridge or command posts. Exo-suit teams are sometimes attached to infantry platoons to provide fire support. The exo-suit forces include the marines' elite of the elite, known as *Dragoons*. They are veteran soldiers with proven experience, advanced training and impressive natural aptitudes.

Artillery fire support is where the Marine Assault Vessel's weaponry comes in. These systems are intended to protect both ship and occupants during transit, though targets which can be destroyed outright will normally be dealt with by ships of the line. Though it is often overkill, the ship can provide fire support from orbit during an operation if needed, whether the operation takes place on the ground or in artificial constructs.

Transport resources refer to the ship's massive cargo areas. The marines need to eat, and their weapons and equipment need ammunition and spare parts. Given the storage space on board a Constantinople-class, the average marine force can stay on station or in combat for well over a month without needing to resupply from a friendly port or vessel.

Deployment includes landing the marines into the battle zone and transferring cargo to forward depots. Shuttles play an important role in this. It is not uncommon for other ships in the squadron to lend the aid of their own craft to speed up operations. Escorts by exos are common for the deployment vehicles, since the loss of a few of these early in a battle may leave the marine landing party overpowered by the defenders.

Technicians, administration staff, quartermasters and surgeons are all vital components of a marine section. Without these, the force will grind to a halt under its own weight. Proper execution of an invasion is as much a function of logistic planning as it is tactical skills. After all, a hungry solider without ammunition has very limited options to fulfill a mission objective.

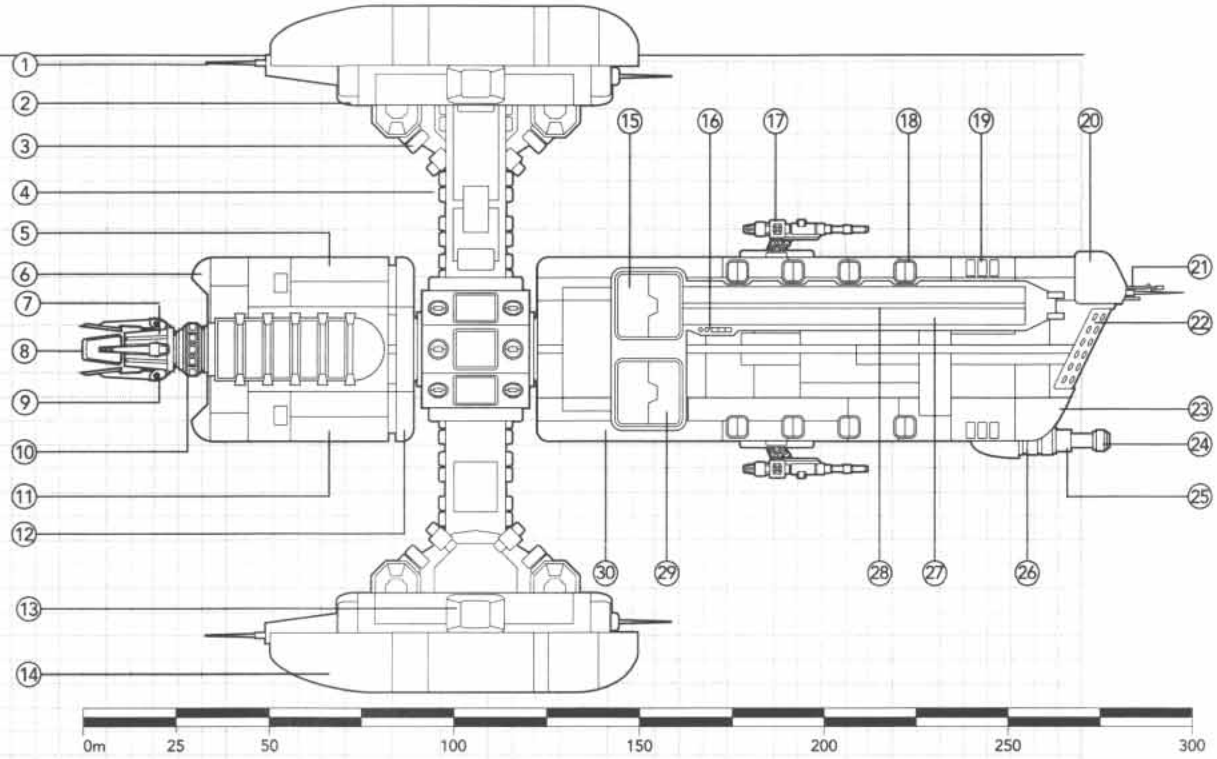
▼ 3.1.2 Operational Role

A single Constantinople's marine force can control a population of around 2,500, sufficient for most targets smaller than colony cylinders. For larger operations, the MAV is accompanied by a passenger liner and an armored transport. The former carries a battalion or more of CEGA army troops while the latter carries their supplies and ground combat vehicles.

Each fleet maintains a regiment of marines bearing the same ID number as theirs. It is from this pool of personnel that the marines carried on all the ships and the marine assault vessels are drawn. There are several times more men available than can be carried at any one time, and most fleets are preparing to form a second official regiment.

▶ 3.2 SHIP SCHEMATICS

◐ Side View

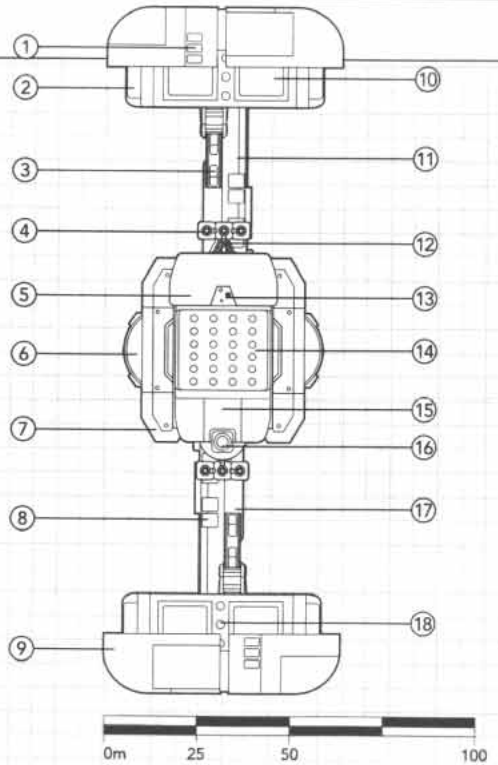


▼ Legend

1	Antenna Array	11	Reaction Mass Tanks	21	Forward Sensor Cluster (retracted)
2	Commons	12	Rear Shield Generators	22	Missile Launch Tubes
3	Habitat Support Brace	13	Escape Boat Cover	23	Forward Blast Panel
4	Life Support System Heat Sinks	14	Habitat Module #2	24	Beam Collimation Assembly
5	Starboard Engine Housing	15	Launch Bay Door	25	PA-26A Particle Cannon
6	Engine Mount/RAM Hardpoint	16	Flight Controller Signals	26	Heat Sink Array
7	Exhaust Coils	17	Upper KKC Turret	27	Starboard Runway
8	Exhaust Collimators	18	Exo-Suit Bay S4	28	Catapult System
9	Hinge	19	Escape Pod Covers	29	Shuttle Bay Door
10	Main Fusion Core	20	Forward PDS Emitter Panel	30	Main Hangar

3.2 SHIP SCHEMATICS (CONT.)

Front View



Legend

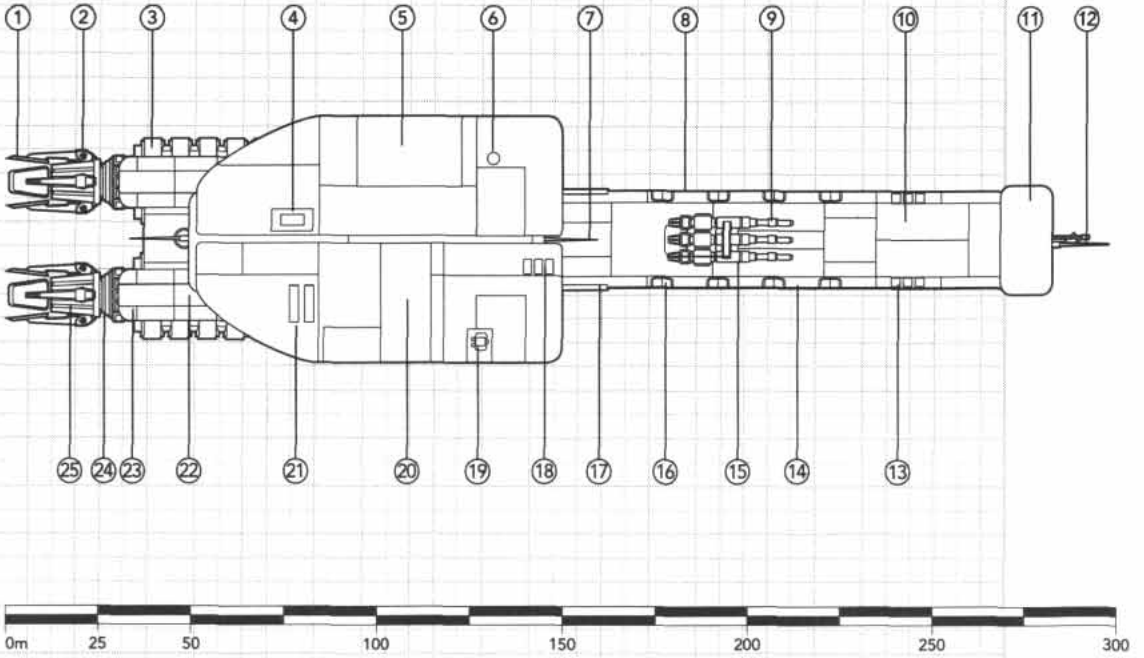
1	Habitat Escape Pod Covers
2	Commons
3	Habitat Support Brace
4	Upper KKC Turret
5	Forward PDS Emitter Panel
6	Structural Rib
7	Starboard Engine Housing
8	Life Support System Heat Sinks
9	Habitat Module #2
10	Laminated Composite Armor
11	Crew Transfer Tubes
12	KKC Turret Hardpoint
13	Forward Sensor Cluster
14	Missile Launch Tubes
15	Forward Blast Panel
16	Particle Cannon
17	Habitat Rotor Arm
18	Short Range Sensor Cluster

Specifications

Name:	Constantinople
Origin:	Central Earth Government & Administration
Manufacturer:	Various Shipyards
Type:	Marine Assault Vessel
Control System:	Bridge w/astronomical display
Length:	267 m (294 overall)
Width (total):	64 m (181 m w/habs)
Empty Weight:	25,000 Tons
Loaded Weight:	35,000 Tons
Main Drive:	2 x 200 MW
Secondary Powerplant:	2 x 2000 KW
Main Thrusters:	2 x 20,000,000 kg (nominal)
Apogee Motors:	46
Acceleration:	0.6 g
Onboard Sensors:	Fire Control Radar, Infrared/ Ultraviolet, Lidar, Magnetometer, Microwaves, Motion Detectors, Radcounter, Search Radar, Telescope
Fixed Armament:	PDS, 6 x Kinetic Kill Cannons, 1 x Missile Bay, 1 x Particle cannon
Additional Armament:	Marine Troops, Auxiliary Craft
Defensive Systems:	Mag Screen
Equipment:	Escape Pods

▶ 3.2 SHIP SCHEMATICS (CONT.)

◐ Top View

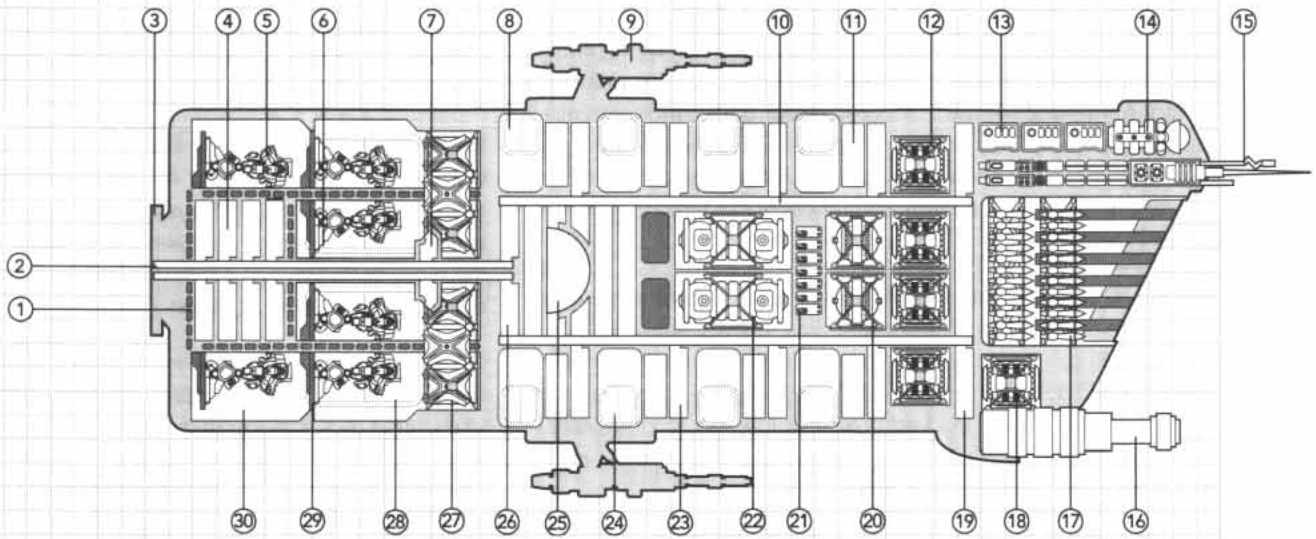


▼ Legend

1	Exhaust Collimators	11	Forward PDS Emitter Panel	21	Escape Boat Covers
2	Hinge	12	Forward Sensor Cluster (retracted)	22	Starboard Engine Housing
3	Structural Rib	13	Hull Escape Boat Cover	23	Engine Mount/RAM Hardpoint
4	Waste Dump Port	14	Starboard Catapult	24	Main Fusion Core
5	Phased Array Sensor Panel	15	Upper KKC Turret	25	Exhaust Coils
6	Short Range Sensor Cluster	16	Exo-Suit Bay S1		
7	Antenna Array	17	Launch Bay Door		
8	Port Runway	18	Habitat Escape Pod Covers		
9	Beam Pointer Housing	19	Habitat Docking Port		
10	Upper Sensor Panel	20	Habitat Module #1		

3.2 SHIP SCHEMATICS (CONT.)

Cutaway View



Legend

1	Lower Level Rad Screen Boosters	11	Marine Exo-Suit Bay	21	Power Management Nodes
2	Engineering/Habitat Access	12	Heat Exchangers	22	Superconducting Batteries
3	Main Rotor Track	13	Upper Avionics Bay	23	Marine Exo-Pilot Quarters
4	Lower Crew Quarters	14	Forward PDS Generator	24	Exo-Suit Launch Port
5	"Ready-5" Exo-Armor	15	Sensor Cluster (Retracted)	25	Bridge
6	Combat Craft Bay	16	Particle Cannon	26	Upper Crew Quarters
7	Control & Observation Deck	17	Missile Bunker	27	Lower Storage Deck
8	Exo-Suit Launch Bay	18	Cannon Heat Exchanger	28	Shuttle Bay
9	Upper KKC Turret	19	Forward Engineering Deck	29	Upper Vehicle Elevator
10	Service Elevator	20	Gas Storage	30	Aft Vehicle Bay

0m 25

▶ 3.3 HISTORY

Well before the start of the space age, it was evident that most major military targets could be reached by a few days' march from the sea. Thus, a nation capable of transporting significant amounts of troops, equipment and supplies by sea (and later, by air) could spread its military influence across the globe. A nation capable of transporting troops in space and establishing a foothold can now use that same military influence on the entire population of a colony cylinder. Even though not all such colonies can be occupied at one time, the threat of military might can keep the smaller ones in line.

The first Constantinople vessel was launched twelve years after the formation of CEGA. Prior to that time, marine transport ships were at best converted passenger liners with little protection and even less weaponry. In some cases, troops were forced to spend days inside a cramped docked orbital shuttle, which doubled as their assault craft. Marines were present, but only in small numbers, on every major CEGA warship.

When the Constantinople became available, the marines finally got a ship all to themselves. Since the cargo bay was designed to be reconfigurable with a few hours' work, the Marine Assault Vessel (MAV) could even carry reentry-capable shuttles to conduct landings on Mars, Venus or a planetary moon. Now the marines were able to reach any human settlement, anywhere.

In the years since the first MAV was launched, significant changes have occurred. While once viewed as a necessary but low-priority item, the CEGA admiralty has since realized what the vessel can do. Using Constantinople MAVs, the fleets can acquire and control distant ports from which to base their operations, in effect "leapfrogging" across the solar system. While the powerful ships of the line can demolish a hostile space force, it is the marines that break up human resistance. It is also the marines that go inside pirate bases to root out those in hiding, and it falls upon the marines, again, to keep prisoners under restraint.

One critical factor that secured the fate of the CEGA Space Marine Regiments was the incident at the Sea of Tranquility. A small squad of unidentified attackers took control of a major He_3 fusion installation on the Moon. Desiring maximum public exposure, the terrorist force transmitted live video feeds out over public channels. As a result, the heroism of the marines sent to take them out was broadcast into every home.

It was during this encounter that the CEGA Space Marine Corps slogan "Aut Pax Aut Bellum" first gained mass notoriety. In order to prevent the deaths of thousands, the marines fought their way to the control room of the fusion plant. With the destruction of the main computer, the secondary safeguards would take effect, eliminating the terrorist threat.

On live broadcast, the world saw a dozen marines break through thirty-four remaining terrorists. Each attempt to place an explosive charge near enough to the enemy's computer core led to the death of a marine. Each time, however, the satchel charge was moved a little closer. At this point, the terrorist leader offered to stop the battle if the marines would let them go freely. A Marine Combat Engineer named Bruce Gunn replied by making one more rush forward with the satchel charge. With a cry of the Gunn family motto, which is Latin for "either peace or war," he dove for the computer core.

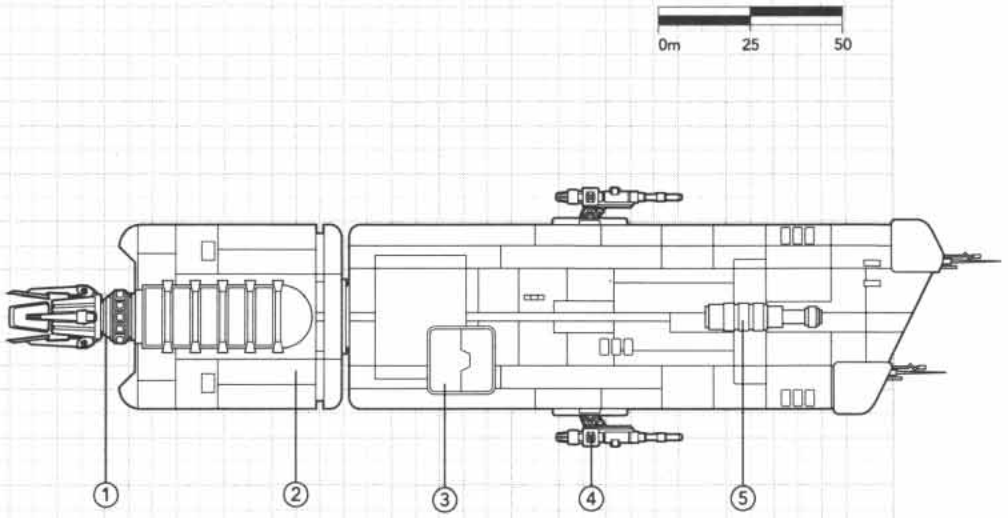
Chief Petty Officer Gunn was quickly slain by the terrorists' weapon fire, but in the reduced gravity of the Moon his body and the satchel charge continued to tumble forward. Gunn had the foresight to activate a five-second timer on the charge before dying, and the explosion destroyed the computer core and killed most of the terrorists in the room. For saving the lives of over eight thousand civilians, Chief Petty Officer Bruce Gunn was posthumously awarded the Cross of St. George. The ceremony was transmitted in as wide a band as the battle itself.

CSS NORMANDY

Constantinople-class Vessels, 2194-2197

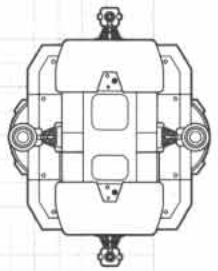
Legend

1	Experimental Armored Drive
2	Reaction Mass Tanks
3	Shuttle Bay Hatch
4	Single KKC Hardpoint
5	P23 Particle Cannon



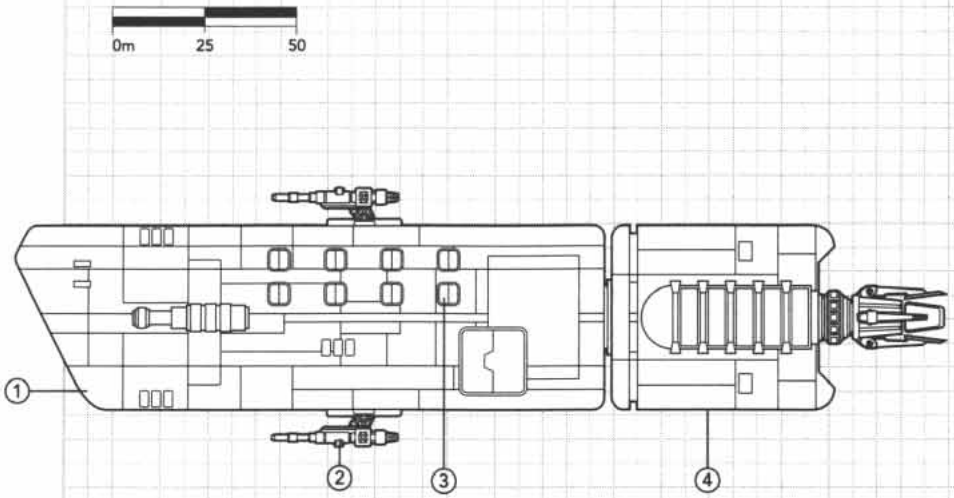
The ship named after the assault of 1944 was launched as part of the 250th anniversary celebrations of the battle. Less than a year later, she was called into action for a lunar assault: a terrorist force was attempting to vent a fusion powered plasma stream through a colony located in the Sea of Tranquility, though layers of safeguards prevented them from immediately vaporizing the civilian population. With little time to prepare, the *Normandy*'s marines landed into an intense firefight. Although they were ultimately successful, casualties were extreme. This initiated the tendancy to provide ever increasing amount of fire support to the marine forces in the field.

The CSS *Normandy* is pictured above as she appeared shortly before conducting her assault on the Moon. These first vessels were little more than armored passenger ships, and, as such, they were somewhat lacking in firepower; troops would be landed via armored shuttles to fight a conventional ground battle. All early vessels have since been refitted to include the newer systems, such as the rotating habitation modules.



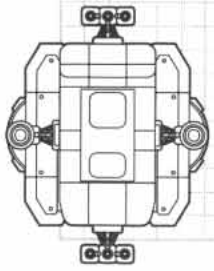
▶ CSS QUEBEC

◐ Constantinople-class Vessels, 2197-2205



▼ Legend

1	Modified Mark IV Sensor Cluster
2	Triple KKC Turret Mount
3	Exo-Suit Launch Bay
4	Revised Drive System



Exo-suits were the first addition made to the marine forces. Capable of independent space movement, exo-suited marines can gain control of a landing zone prior to the arrival of transport craft. Under the same enhancement program, the single KKC mounts were replaced by full turrets, to sweep the areas around the marine insertion path.

Pictured above is the *Quebec* during her first tour of the asteroid belt. The purpose of this mission was to put into practice various concepts on the integration of exo-suits into the marine force. She is named for Colonel Wolfe's cross Atlantic invasion in the 18th century.

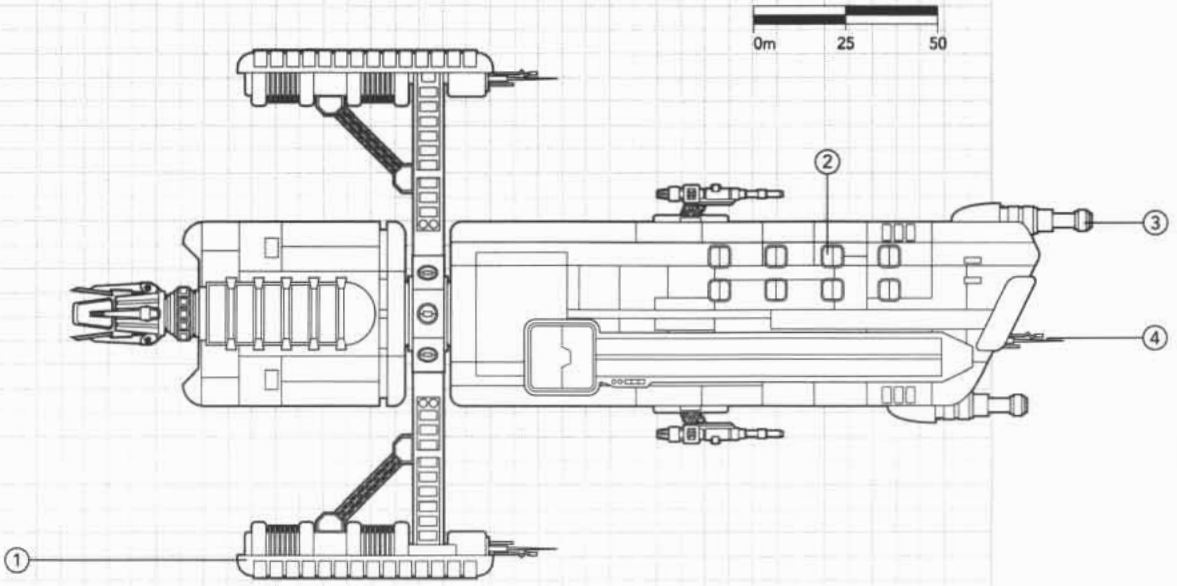
The CSS *Inchon* is named for the Korean war action which recovered the southern peninsula. Normally the first vessel in a new class goes to Fleet 1, however, as the marine systems were classified under the budget for carried craft, this tradition was not followed. In the end, it was the *Inchon*, the fifth vessel produced, that joined Fleet 1. Much of her time is spent moving station garrisons between assignments.

CSS SEA OF TRANQUILITY

Constantinople-class Vessels, 2205-2208

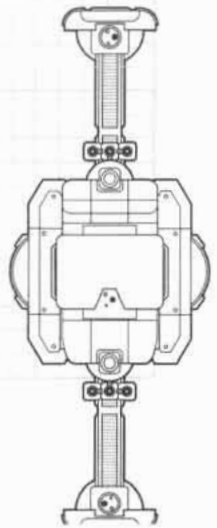
Legend

1 Early Habitat Module
2 Revised Exo-Suit Launch Bay
3 P53 Particle Cannon
4 Armored Phased Sensor Array



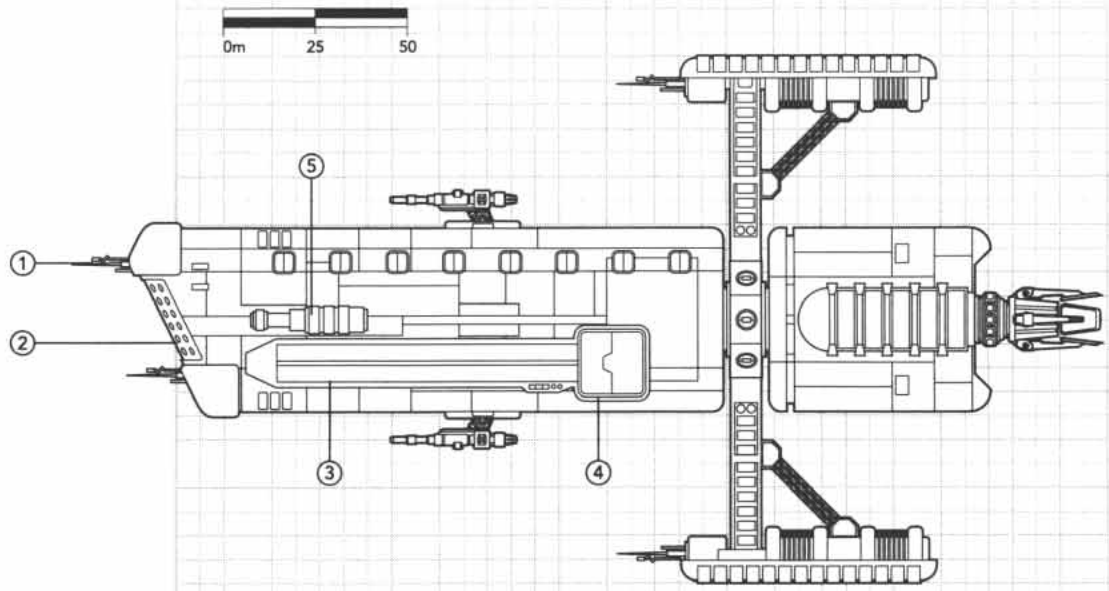
After numerous evaluations, trials and engagements by the first block of vessels, a whole new list of requirements were drawn up for the subsequent ships. One of the most significant changes was the addition of a rotor assembly, a rarity on CEGA vessels. The simulated gravity allows marines to conduct physical exercise and maintain a higher level of readiness. The introduction of catapult systems allowed a pair of exo-armors to be carried in support of the marines. In order to accommodate the catapults, the particle cannons were moved to the bow. The weapon systems frequently overloaded the nearby sensor systems, however. Due to a surprising lack of coordination between the two development groups, Weaponry and Hull, this situation would prove difficult to resolve.

Only one vessel was produced in this configuration, the *Sea of Tranquility*. She is, of course, named for the CEGA marine action conducted by her sister ship *Normandy*. This vessel stays in close proximity to Earth as a deterrent to terrorists and raiders and as a training vessel for new recruits.



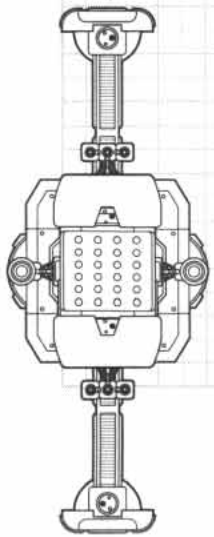
▶ CSS GALLIPOLI

◐ Constantinople-class Vessels, 2208-2209



▼ Legend

1	Revised Mark IV-B Sensor System
2	Missile Launch Tubes
3	Runway with Catapult
4	Redesigned Cargo Bay
5	P56 Particle Cannon



Production rates increased dramatically for the third purchase order. Correction of the particle gun versus sensor incompatibility situation was attempted by placing both the catapults and cannon off the centerline; the bow was refitted with a missile bay, with the sensor systems on either side. Unfortunately, firing the particle cannons still blinded the sensor systems, but at least the missile launchers proved effective in an artillery support role.

The new purchase order followed tradition, and the first new ship was assigned to Fleet 1. CSS *Gallipoli* has seen several actions so far, one of which was to support UN peacekeeping operations on the nomad colony Pompeii.

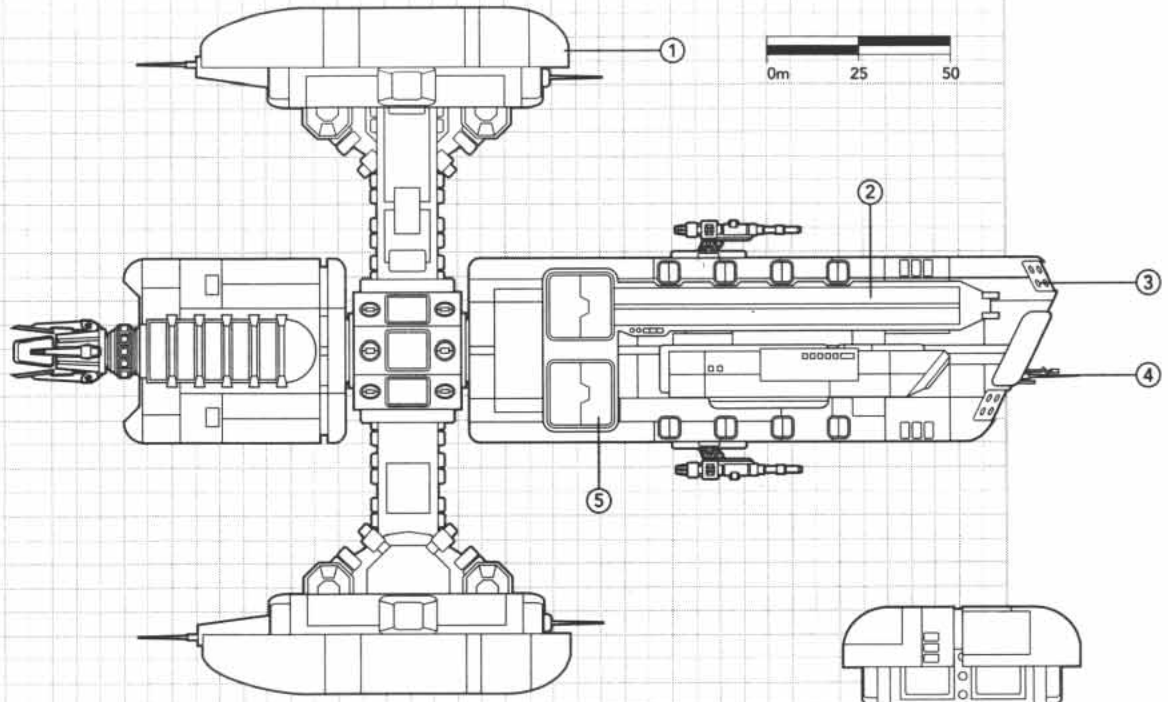
A quirk in the production line meant that the CSS *Jakarta* was launched not long after the *Gallipoli*. Fleet 2 is using the *Jakarta* and the CSS *Quebec* to conduct marine versus marine wargames. Many of these operations center around capturing a colony cylinder; the implications have not been lost on the Jovian Confederation.

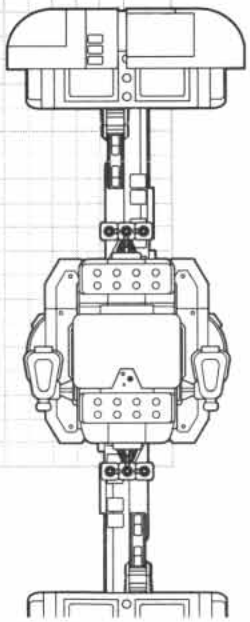
CSS TIENTSIN

Constantinople-class Vessels, 2209-2210

Legend

1	Poseidon-style Habitat
2	Redesigned Runway
3	Missile Launch Tubes
4	K90 Sensor Array
5	Second Cargo bay Hatch





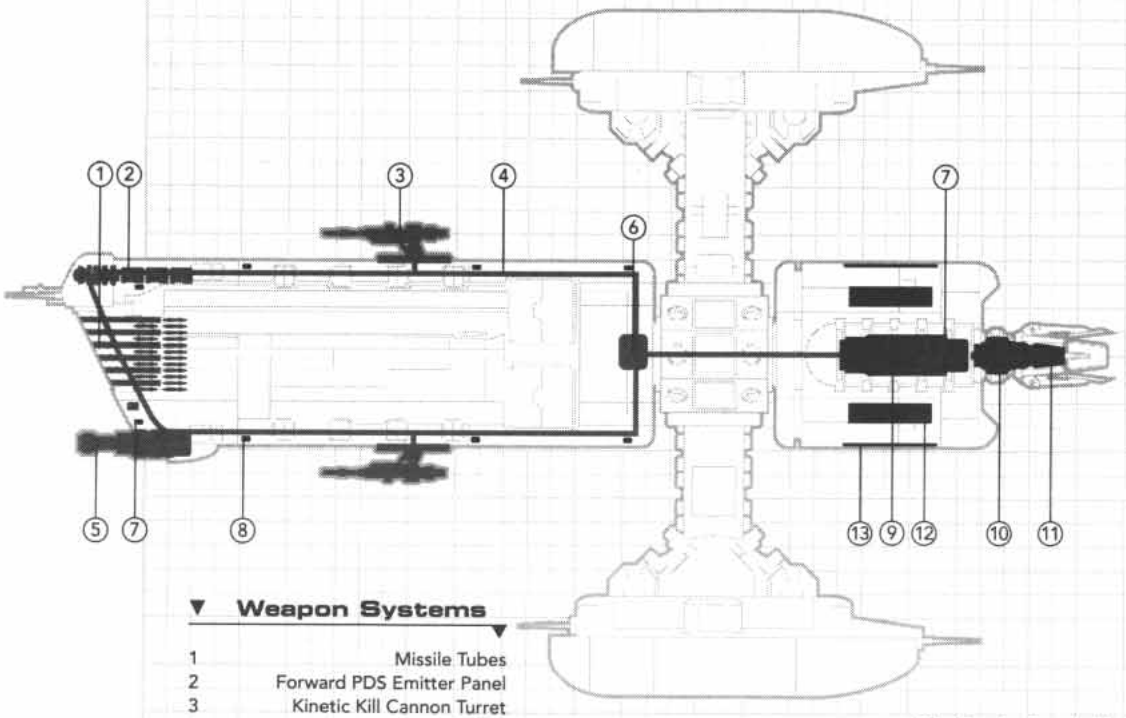
It was realized that, with little work, the habitation modules used on the Poseidon-class battleship could be used on the Constantinople. The larger volume allowed more troops to be carried under better conditions, and for longer periods of time. A second set of cargo doors were added for easier logistic and carried craft operations.

In 2181, a combined NorAm/European force attempted to drive toward Beijing. The battle of Tientsin became a turning point as it forced peace talks to resume. The CSS *Tientsin* is often used to make political settlements.

The CSS *Iwo Jima* specializes in small action warfare, performing series of sequential battles rather than one large engagement. This places heavy requirements on the support forces, who are well known and respected in military circles.

▶ 3.4 SHIP SYSTEMS

◐ Weapons & Propulsion Systems



▼ Weapon Systems

1	Missile Tubes
2	Forward PDS Emitter Panel
3	Kinetic Kill Cannon Turret
4	PDS Power Conduits
5	Particle Cannon Systems
6	Main Power Conduits

▼ Propulsion Sys.

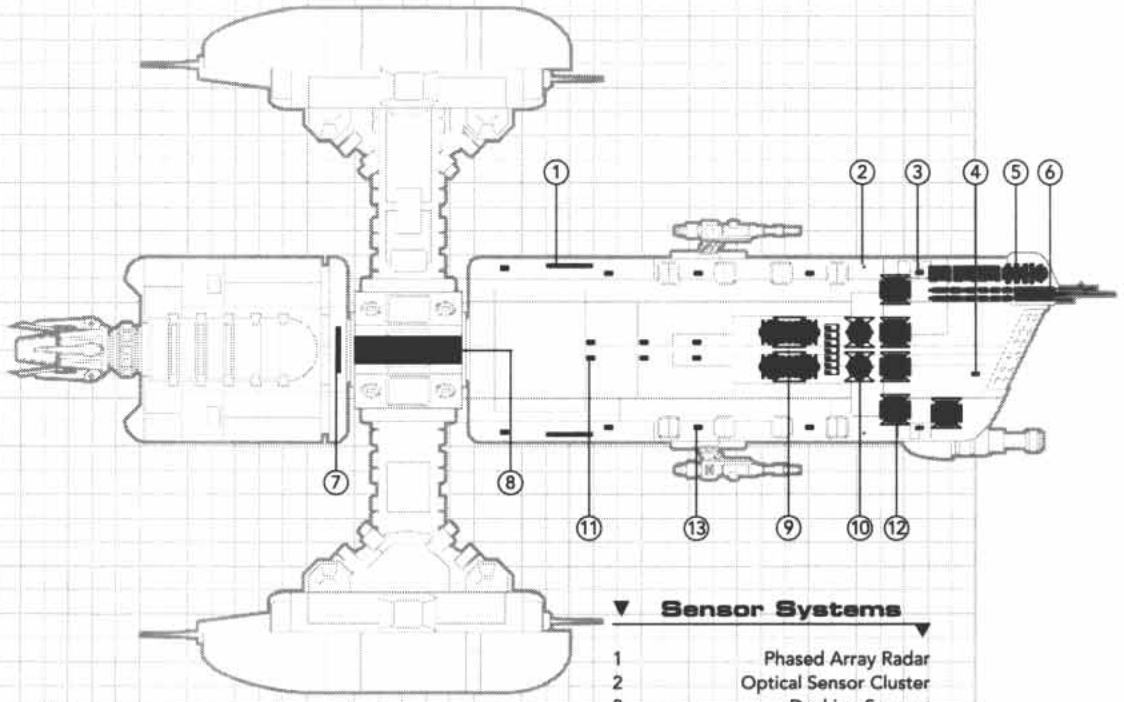
7	Plasma Arc RCS Cluster
8	Hypergolic RCS Thrusters
9	Reaction Mass Tanks
10	Plasma Combustion Chamber
11	Exhaust Collimator Coils
12	EM Power Generation System
13	Radiator Panels

The Constantinople-class is one of the few ships in the CEGA Navy to be equipped with a rotating habitation array: the rotor arms makes it easily identifiable. While the main hull shape remained fairly consistent throughout the ship's service life, the external fittings have undergone considerable change. Recent ships will generally have fitting to dock landing cutters on the side of the main hull.

The bow contains more than half the firepower of the marine assault vessel, though the weapons keeps interfering with the functions of the sensor systems. The placement of missile bays, particle cannons and sensor systems changed considerably over time, but at last a balance has been struck. The particle cannons and sensor arrays are now mounted on opposite corners of the bow; the missile bay, located in the middle, has little effect on either systems.

3.4 SHIP SYSTEMS

Sensors and Life Support Systems



▼ Sensor Systems

1 Phased Array Radar
2 Optical Sensor Cluster
3 Docking Sensors
4 Instrument Cluster
5 Laser Ranging and LiDAR Emitters
6 Microwave Pulse-Ranging Antennae

▼ Life Support Sys.

7 Shield Generators
8 Rotor Bearing Assembly
9 Superconducting Batteries
10 Gas Storage
11 Local Support Systems
12 Heat Exchangers
13 Life Support Nodes

The majority of the mid-hull is taken up by cargo spaces, life support stores, marine stores and exo-suit bays. Studding the outside surface of the ship, numerous hatches used to launch the exo-suit force *en masse* are lined up in two rows. In the event of hatch failure, internal walkways allow the exo-suits to move to another bay. Storage areas and catapults for exo-armors are also present.

The rotating habitation modules and armored engine pods form the aft portion of the ship. It was found more efficient to use the same habitation pods as the Poseidon battleship. Internal arrangements and some systems differ between the two, however. The Constantinople needs less command sections and features more exercise areas, mess halls and higher density accomodations. The habitats also lack the external fittings needed to carry the particle cannons.

▼ 3.4.1 Armory

The Constantinople features several armories where the marines store their weaponry between battles and practices. Personal weapons, like sidearms, are generally stored where they are protected but readily accessible (most cabins have a special locker for this purpose). The main reserves of weapons and ammunition are stored in two heavily-shielded armories. Each armory contains more than just pistols and rifles: exo-suit weapons, missiles, machine guns and demolition charges can be found in color-tagged storage lockers. The room is well-organized to help locate the proper equipment quickly. The hallways around the rooms are shaped to vent an ammunition explosion outward if the blast cannot be contained. The two armories offer great redundancy, allowing marines to continue their mission even if one is destroyed.

Security around the armory areas is particularly tight. Two marines are posted at the entrance at all time and access requires two keys to be turned simultaneously (neither is within arm's reach of the other). Unfortunately, this is generally impractical, and quartermasters are notorious for just leaving the door open to keep the ammunition flowing out during battles.

▼ 3.4.2 Commons

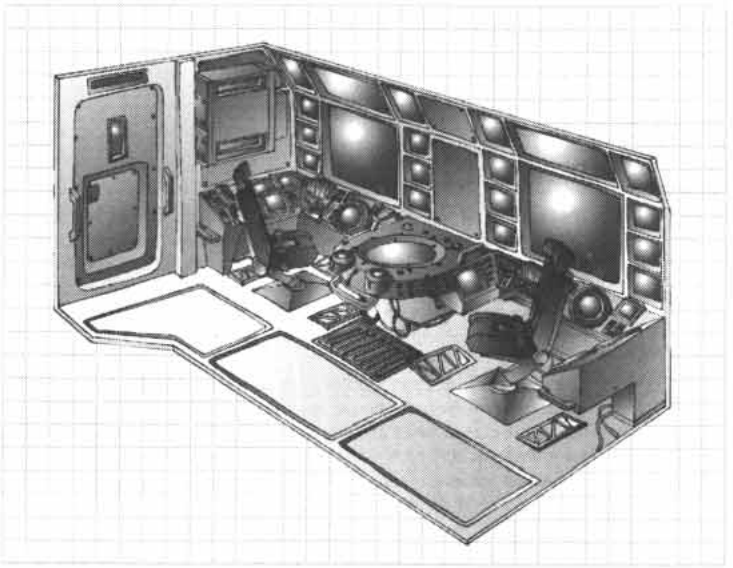
CEGA naval vessels rarely use spinning habitation sections. Having a large reserve of manpower for crew health rotations, the Navy prefers to save the extra mass for use elsewhere. The Constantinople-class ship is one of the few exceptions. It uses twin rotating habitats based on those of the Poseidon-class battleship to supply its large crew with cabins, commons and galleys under partial gravity for increased comfort during long cruises.

Each habitat features general access commons near the entrance elevators. The commons are arranged for entertainment and socializing, consisting of several groups of comfortable chairs. Multipurpose entertainment consoles are available as well throughout the room.

▼ 3.4.3 Marine Command Center

The Marine Command Center is the operational heart of marine missions deployed from the Constantinople-class vessels. From here, the force commander can monitor all of the marine troops engaged during a mission. Other displays provide continuous intelligence updates as needed. This room also acts as a fire controller, to coordinate naval fire support requests from troops in the field.

During operations, the commander's communication staff normally operate from this location. A holographic display system occupies the center of the room and is used to get an overview of the tactical situation around the troops. By monitoring the different comm channels, the command staff provides continuously updated information to the troopers. If needed, video feeds from exo-suits or infantry carried equipment can be retransmitted at will for display in friendly HUD. All of the data is recorded for later evaluation of both the marines and the enemies' activities.



▼ 3.4.4 Courtroom

As enforcers of CEGA's policies, the marines also protect a detachment of legal personnel, who conduct trials for criminals arrested far from large population centers. Suspects are given fair trial without having to return to a large settlement, which may be weeks away. Despite many claims to the contrary, these courts dispense justice in strict accordance with CEGA law.

A judge sits in the center of the room facing two desks, one for the prosecution and one for the defense. There is separate seating for jurors and those wishing to attend. Due to the difficulty in acquiring neutral people for a jury, most of the rulings are made by the judge. Public relation officials record the proceedings for the public archives, though when military operations are involved the amount of material that can be released is limited. Military justice officials also make use of the Constantinople's courtroom.

▼ 3.4.5 Assault Bay

One section of the cargo bay is fitted as an assault bay. It is there that the marines keep their armored space suits near neat rows of Piranha assault boarding pods. Lockers beside each spacesuit store weapons and gear for use on missions. Both the suits and lockers are coded to respond to their owner's palm print only, though senior officers may open any of them for the purpose of inspection or emergency access.

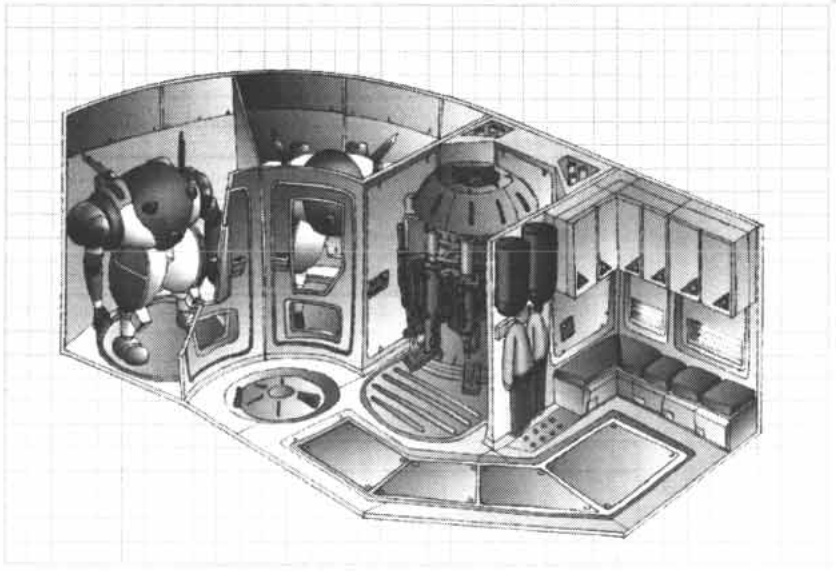
The assault bay is normally kept pressurized to allow marines to conduct scheduled maintenance. Airlocks allow access to the habitation areas of the ship or to the unpressurized areas of the cargo bay. As with most cargo areas, the assault bay only has "gravity" when the ship is thrusting, and all items are tethered. Piranha pods are assigned to specific squads, so most have customized names and decorations on them. Near each pod there is a space for the squad to assemble into an orderly fashion. Piranha pods are moved by a conveyor out to the main bay door; they may either launch under their own power or be sent out by catapult.

▼ 3.4.6 Marine Exo-Suit Bay

Each marine exo-suit is stored in a separate cubicle with its own hatch leading to the external launch doors. This permits a very rapid deployment of the marines. With this, the MAV can move in close to a target prior to the launch, reducing the likelihood of point defense systems shooting down the marines.

To accomplish this type of deployment, each exo-suit bay is actually a specially fitted airlock. Thus, the interior of the MAV is safely sealed during the launch. Racks for the suits' weapons, spare weapons and extra ammunition are found just outside the suits' cubicles. In an extended ship-to-ship action, the exo-suits can rearm themselves without assistance.

Tools for repairs are kept near the exo-suit bays. CEGA exo-suit pilots are expected to do their own regular maintenance on the suit and weapons. For battle damage and complex procedures, the pilots receive assistance from the force's technicians.



▶ 3.5 SHIP PERSONNEL

The ship's native complement is organized as a separate entity from the marine force to facilitate the rotation or transfer of the marines. The MAV is normally commanded by a captain, who has overall responsibility for the operation of the vessel and troops. In large operations, a flag officer of commodore rank or higher is present. Like the Poseidon-class battleships, the Constantinople-class have the resources for fleet command facilities. Due to the very large number of personnel aboard, the MAV is one of the few ships to have a Stewards Department. They assist in providing food and other services for all on board.

As a branch of the CEGA navy, the marines use the naval ranking system. A lt. commander is in charge, with the company commanders generally being lieutenants. Combat platoons, support operations and combat engineering typically have an ensign or junior lt. as head. Due to the number of people on board, an Internal Operations section is present to monitor the conduct and morale of the marines and act as counselors.

Crew Organization Chart

Captain	
First Officer	
Watch Officer	2
Sensor Specialist	2
Communications Specialist	2
Helmsman	2
Navigator	2
Medic	2
Computer Specialist	2
EVA Specialist	2
Quartermaster	4
Cargo Handler	2
Chief Steward	
Master Cook	2
Steward	6
Chief Engineer	
Bosun	8
Engineer	6
Generator Specialist	2
PC Specialist	4

Marine Organization Chart

Marine Command:	
Marine Commander	1
Administrator	1
Communication & Intelligence Specialist	8
Infantry Company:	
Company Commander	1
Company Warrant Officer	1
Platoon Commander	3
Platoon Warrant Officer	3
CPO	6
Combat Medics	3
Marines	75
Exo-Suit Company:	
ES Company Commander	1
ES Company Warrant Officer	1
ES Platoon Commander & Warrant Officer	4
ES CPO	5
ES Marine	20
ES Dragoon Platoon Commander & Warrant Officer	2
ES Dragoon CPO	3
ES Dragoon Marine	12
Combat Engineering Operations	
Engineering Officer	1
Engineering Warrant Officer	1
Specialist (Demolition, Security , Construction , Reactor)	10
Engineer	8
Flight Operations:	
Flight Chief	1
Hangar Supervisor	1
Exo Pilots	2
Cutter Crew	8
Shuttle Pilot	4
Traffic Controllers	4
Legal Operations:	
Judge	1
Bailiff	2
Legal Specialist	6
Internal Operations:	
Officer of Internal Affairs	1
Administrator	1
Morale Specialists & Chaplains	4
Military Police	6
Support Operations:	
Operations Officer	1
Platoon Warrant Officer	1
Technical Specialist (Electronic , Ordnance, Actuator, Computer)	10
Deck Hands	8
Quartermaster	4
Medical Personnel (Surgeons, Nurses)	4

▼ 3.5.1 Interview with a Marine Commander

Name:	**Lynn Chung**
Rank:	**Lt. Commander**
Current Assignment:	**CSS *Tientsin***

"I'm a lieutenant commander in the CEGA Space Marines. That's the equivalent rank to a major in the army. All the marines onboard are under my command. Trust me, we have a lot.

"The marines have a proud history of protecting the interests of Earth. Whether it be on the Moon, in a colony cylinder or a deep space station, you can count on us being there for your safety. There is no questioning the honor of the marines. I'll be up front and tell you that it's a duty as dangerous as it is important.

"Our goal is the safety of CEGA nationals as they go about their business. Our tools include exo-vehicles, missiles, lasers, knives, fists and the stern look of a dedicated warrior. Combat engineers can make a station or blow one apart. Computer specialists can program code to make a system run better or hack through a target's defenses. You want technical training? Check out all the support staff we have. From administrators to electronic repair specialists, we're the marines and we do it all.

"Our requirements are physical fitness, mental awareness and determination. Boot camp will make sure recruits have those and bring them all out to the surface. Marines seem to still have a reputation for being unthinking 'jar heads.' That comes from those who try to convince a marine to fall short of the tasks that CEGA sent him to do. Since they can't manipulate us they think that makes us stupid. Truth is, we are just committed to our duty. We want peace, but we have to be prepared for war."

▼ 3.5.1 Interview with a Magistrate

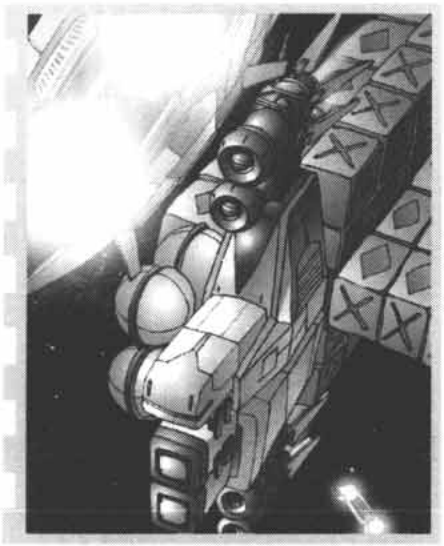
Name:	**Greg Williams**
Rank:	**Judge of Interplanetary Law**
Current Assginment:	**CSS *Quebec***

"Once a person's actions have been confirmed, it is for the law to supply the consequences. There are detailed procedures to adhere to and traditions to follow. What we call law is a written embodiment of our culture; as a judge, I help protect that culture.

"The staff assigned to assist me include lawyers, though we prefer to call them legal specialists. These professionals are often contracted civilians, well schooled in matters of law. We will always have two aboard who have authorization from the Naval Justice to perform the role of advocate on issues of military law. Advisors can be contacted to review particular issues if needed. Due to the time lag in interplanetary communications, these remote persons will never be an acceptable substitute for lawyers in the courtroom. Other members of my staff include bailiffs who look after the day-to-day running of the court.

"If you wish to look for precedence for this type of court, I suggest you look at the traveling judges of what is now called the 'Wild West' era — late nineteenth century, if I recall. Like today, the settlements then were widely scattered and had relatively low populations. Thus duly-appointed legal professionals, such as judges, traveled between them to hold courts on a periodic basis. Criminals and suspects would be held at local facilities until the judge arrived. In the CEGA navy, the Constantinople-class always spends time in far-away ports overseeing local cases. Sometimes, we may be the only justice within millions of kilometers."

KNOCKING ON THE DOOR



Captain Allison Date locked her command chair's restraining strap down across her shoulders and lap. "Begin breaker burn."

The attack carrier *Lexington* lurched as the fusion powered drives vented hyperheated hydrogen plasma out of the rear of the ship. She felt her body press back into the cushions as Newton was proved right once again.

Her radio operator flashed online, reporting. "Sparrow recon drone registering the presence of Jovian warships. One Forge, one Alexander and one Gagarin. Transport identified as the *Alan Sheppard*, destroyer is *Ghengis Khan* and the carrier is. . . the *Falchion*."

"Recall the Fury and have it kitted out for an attack mission. Prepare the squadron for launch," Date ordered, sharply. "Tell them to use battle plan Gamma. Comm, get me Commodore Goering."

* * *

"I agree," said Goering to Date's image, "In addition to fuel, the Sheppard must have been carrying exo-armors — or at least exo-armor parts. Our first boarding party ran into heavy resistance in the form of a pair of Decker exo-suits."

"Do we have jurisdiction yet?" Date asked.

"Yes, finally." Goering snorted quietly. "They fired first. That makes it possible to classify the arms as intended for use against CEGA. It will be easy for the courts to mark our actions as being in the interests of protecting national security."

Date looked across her bridge for a moment, then back at the screen. "Ebriiu-class transport *Duke Dudley* identified. They've just finishing loading on one more crate. She's already casting off moorings." Her expression darkened as the indicators changed. "Damn. . . We just lost the drone."

Goering nodded, "The dealers take off on the fastest ships and hope the weapons can make it out on their own." He turned to his bridge, delivering orders in rapid-fire. "Release the cutters! Cutter one. . . intercept the *Duke*, prisoners preferred. Cargo seizure mandatory. Cutter two, take control of the dock." He looked back to the comm, his expression apologetic. "Time to part ways, it appears. We're still on for coffee afterwards?"

Date smiled slightly. "You bet." Her signal flickered, then died as she cut communication.

"Jovian vessels maneuvering sir," advised one of his aides. "*Sheppard* and *Falchion* withdrawing. The *Ghengis Khan* is moving in to escort the *Duke*."

"Form into Keep and Bastion formation," ordered Goering, "Destroyer *Aname* and *Toshiro* to form the keep. Balance the placement of the corvettes."

The comm specialist piped up. "Message from the Jovians. Standard warning to stay out of the affairs of independent colonies. . . lack of jurisdiction. . . threats of military action to defend. Any reply this time?"

Goering rubbed his bearded chin. "Just give them the basics. Terrorists have been smuggling arms in for use against CEGA. We already have proof and are acting to prevent further terrorist action. The *Duke Dudley*, her crew and the dock she just launched from are part of the smuggling operation. We hereby place all persons involved under arrest."

After typing a few keystrokes, the comm operator replied, "Message sent. Reply coming. They didn't like it, sir. Jovian exo-armors moving to protect the *Duke*."

Goering settled back in his chair, steepling his fingers. "Send this to the *Lexington* and ADB-32: enemy exo-armors in sight. Eliminate them if need be."

* * *

Strapped to the side of the cutter's cargo area, David tried to keep himself calm. As an infantry foot soldier he was going in bare, unlike the exo-suit troops sitting across the aisle. His heart started to beat faster. He pulled up his automatic shotgun and checked the ammunition gauge for the fourth time in the past ten minutes.

"All right, marines, let's get settled." barked lieutenant Sharpe. "Up ahead is a colony being used for trade and for smuggling. What we are being sent to do is take out the smuggling operation. They know we are coming and will be ready to shoot you all on sight. Shoot straight and they'll be the first ones to die, not you or your pals."

David checked his satchel charge. The standby light was on, flashing a comforting rhythm. Just remove the security tab, and with the flick of another switch it would begin a five second countdown to detonation.

"They just loaded the cargo," the lieutenant was forced to crouch down in the aisle as the cutter twisted to one side, "so we want to take them and any nearby materials as evidence. Try to keep most of it in one piece."

The lieutenant sat down in his chair. He pulled straps over his Herc suit to keep him in place during the final approach. Shaking from side to side, the cutter was dodging fire with a maneuverability usually reserved for exos themselves.

A light turned on overhead as pumps pulled the bay's atmosphere away. Everyone was already sealed for action. As the cargo door opened, the exo-suits jumped out first. One of them blew up instantly. The others began firing at targets outside.

David laughed to himself, a raw sound bordering on hysteria. "Look at me now, Ma. . . glory of war? We're a goddamned sardine can tossed into a bucket of firecrackers!"

* * *

The cutter landed hard in the zero-gee cargo handling bay of the colony. Minotaurs and Kobalts spun in a deadly dance with Decker exo-suits. With the ship no longer evading, the cutter's turrets could finally track their targets with some degree of accuracy.

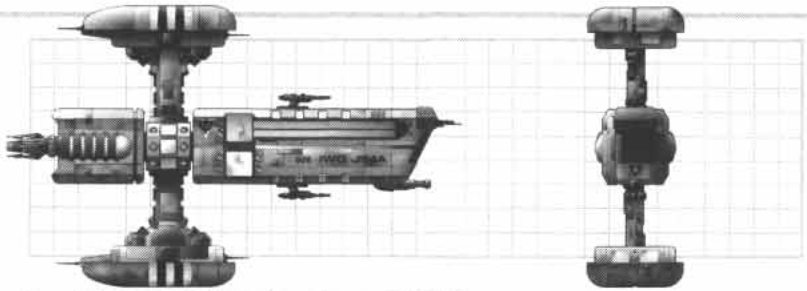
David jetted out of the cutter's bay, propelled by his MMU backpack. Laser beams from the vessel cut down the defenders in waves. Quickly, they retreated behind a bulkhead door, which slammed shut a few meters ahead of the young marine.

"Like that will stop us," David commented. Pulling away the covers on the satchel charge's adhesive pads, he slapped it against the door. Taking out a bowl shield, he turned it to keep the blast directed at the door. He thumbed the arming switch and jetted backwards, howling:

"Fire in the hole!"

Five seconds later, the door blew open. The hallway on the other side was slowly rotating, an access way to the gravity section of the colony. Angry gunfire blazed through it in both directions. A Kobalt exo-suit swung forward and sent a grenade bundle through the door: flashes of light marked the series of detonations. The room became still.

"Aut Pax Aut Bellum," cried Sharpe as he pressed through the door. "When in doubt, grenade it out. Onwards!!"



Constantinople-class MAV

Overall Data:

TV: 150,000	Off. TV: 64000	Def. TV: 2800	Misc. TV: 375000	Cost: 193 M	Indv lemon dice:3

Movement Data:

Mode: Space	Combat: 4 (0.4g)	Top: 8 (0.8g)	Maneuver: -3	Range: 3,000 hrs	Re.Mass: 2,000BP

Sections:

1 x Main Hull	2 x KKC Turret	2 x Habitat Module
2 x Drive		

Off & Def Systems

1 x Point Defense System (main hull)	1 x Missile Bay (main hull)	1 x Particle Cannon (main hull)
6 x Kinetic Kill Cannon (turrets)		

Section: Main Hull

Main Data:

TV: 95,000	Off. TV: 17,000	Def. TV: 720	Misc. TV: 270,000	Cost: 110 M	Indv lemon dice: 3
Crew: 96	Actions: 7	Sensors: 0/2 km	Comm.: 0/10 km	Fire Control: 0	Type: Early Prodc.
Hull Size: 70	Default Size: 43	Base Armor: 50	Light: 50	Heavy: 100	Overkill: 150

Movement Data:

Mode: Towed	Combat: -	Top: -	Maneuver: -	Range: 2,000 hrs	Re. Mass: -

Perks & Flaws:

Name	Rating	Game Effect	Name	Rating	Game Effect
Autopilot	-	Lvl 1 pilot	Laboratories	1	Electronics, Interrogation, Mechanics
Backup Sys	2	Comm, Fire Con, Life Sup, Sensor	Laboratories	2	Law, Leadership
Cargo Bay	-	60,000 m³	Life Support	-	Full
Catapult x 2	4	(600/mass) m/s²	Passenger Accom	-	40,000 m³
Computer	4	CRE 0, KNO 0, PP 4	Reinf. Crew Comp	2	Absorbs first two "Crew" hits
Ejection System	-	500 places	Satellite Uplink	-	x1000 Comm range
HEP: All	-	Sealed	Sick Bay	4	Zero-Gravity Medbay
HEP: Radiation	4	Screen	Tool Arm x 2	6	Hangar cranes; cannot punch

Offensive and Defensive Systems:

Qty	Name	Arc	DM	BR	ACC	ROF	Ammo	Special	MS	WC	AC
1	PDS (ranged)	T	x10	1	+1	6	inf	AM, Heat	15	7400	n/a
	PDS (shield)	FF	x20	M	+1	0	inf	Def., E-shield, Heat	3	75	n/a
1	Missile Bay	T	x30	5	-2	5	30	Mis, G, Concealed	14	7000	6.2
1	Particle Cannon	FF	x28	7	0	0	inf.	Haywire	11	5600	n/a

Section: KKC Turret

Main Data:

TV: 8000	Off. TV: 23,000	Def. TV: 250	Misc. TV: 800	Cost: 8 M	Indv lemon dice: 3
Crew: 3	Actions: 3	Sensors: -5/2 km	Comm.: -5/10 km	Fire Control: 0	Type: Early Prodc.
Hull Size: 19	Default Size: 20	Base Armor: 20	Light: 20	Heavy: 40	Overkill: 60

Movement Data:

Mode: Towed	Combat: -	Top: -	Maneuver: -	Range: 1,000 hrs	Re. Mass: -

Perks & Flaws:

Name	Rating	Game Effect	Name	Rating	Game Effect
Backup FireCon	-	Absorbs first "FireCon" hit			
HEP: Radiation	4	Screen			
HEP: Vacuum	-	Sealed			
Life Support	-	Full			
Reinf. Crew Comp.	1	Absorbs first "Crew" hits			
Weapon Link	-	All kinetic kill cannons			

Offensive and Defensive Systems:

Qty	Name	Arc	DM	BR	ACC	ROF	Ammo	Special	MS	WC	AC
3	KK Cannon	L/R	x25	6	-2	3	300ea	AP	6	4800	8.4

Section: Habitat Module

Main Data:

TV: 11,000	Off. TV: 0	Def. TV: 160	Misc. TV: 334,000	Cost: 2.4 M	Indv lemon dice: 3
Crew: 3	Actions: 3	Sensors: -3/2 km	Comm.: -3/10 km	Fire Control: 0	Type: Early Prodc.
Hull Size: 15	Default Size: 13	Base Armor: 25	Light: 25	Heavy: 50	Overkill: 75

Movement Data:

Mode: Towed	Combat: -	Top: -	Maneuver: -	Range: 1,000 hrs	Re. Mass: -

Perks & Flaws:

Name	Rating	Game Effect	Name	Rating	Game Effect
Backup Life Sup	-	Alternate systems	Reinf. Crew Comp.	3	Absorbs first two "Crew" hits
Cargo Bay	-	40 m³	Sick Bay	2	Medbay
Ejection System	-	256 places			
HEP: All	-	Sealed			
HEP: Radiation	6	Screen			
Laboratories	-	Cooking 1, Electronics 1, Mechanics 1			
Life Support	-	Full			
Passenger Accom	-	12,000 m³			

Offensive and Defensive Systems:

Qty	Name	Arc	DM	BR	ACC	ROF	Ammo	Special	MS	WC	AC

▶ Section: Drive Module

▼ Main Data:

TV: 5500	Off. TV: 0	Def. TV: 770	Misc. TV: 80000	Cost: 5.6 M	Indv lemon dice: 3
Crew: 4	Actions: 4	Sensors: -5/2 km	Comm.: -5/10 km	Fire Control: 0	Type: Early Prodc.
Hull Size: 46	Default Size: 18	Base Armor: 50	Light: 50	Heavy: 100	Overkill: 150

▼ Movement Data:

Mode: Space	Combat: 23 (2.3g)	Top: 46 (4.6g)	Maneuver: -3	Range: 3,000 hrs	Re.Mass10000 BP

▼ Perks & Flaws:

Name	Rating	Game Effect	Name	Rating	Game Effect
Backup Sys.	-	Comm, Fire Con, Life Sup, Sensor			
Ejection System	-	12 places			
HEP: Vacuum	-	Sealed			
HEP: Radiation	4	Screen			
Life Support	-	Full			
Reinf. Crew Comp.	2	Absorbs first two "Crew" hits			

▼ Offensive and Defensive Systems:

Qty	Name	Arc	DM	BR	ACC	ROF	Ammo	Special	MS	WC	AC
-											

▶ Section:

▼ Main Data:

TV: -	Off. TV: -	Def. TV: -	Misc. TV: -	Cost: -	Indv lemon dice: -
Crew: -	Actions: -	Sensors: -	Comm.: -	Fire Control: -	Type: -
Hull Size: -	Default Size: -	Base Armor: -	Light: -	Heavy: -	Overkill: -

▼ Movement Data:

Mode: -	Combat: -	Top: -	Maneuver: -	Range: -	Re. Mass: -

▼ Perks & Flaws:

Name	Rating	Game Effect	Name	Rating	Game Effect
-					
-					
-					
-					
-					
-					
-					
-					

▼ Offensive and Defensive Systems:

Qty	Name	Arc	DM	BR	ACC	ROF	Ammo	Special	MS	WC	AC
-											
-											
-											
-											
-											
-											

▶ Section:

▼ Main Data:

TV: -	Off. TV: -	Def. TV: -	Misc. TV: -	Cost: -	Indv lemon dice: -
Crew: -	Actions: -	Sensors: -	Comm.: -	Fire Control: -	Type: -
Hull Size: -	Default Size: -	Base Armor: -	Light: -	Heavy: -	Overkill: -

▼ Movement Data:

Mode: -	Combat: -	Top: -	Maneuver: -	Range: -	Re. Mass: -

▼ Perks & Flaws:

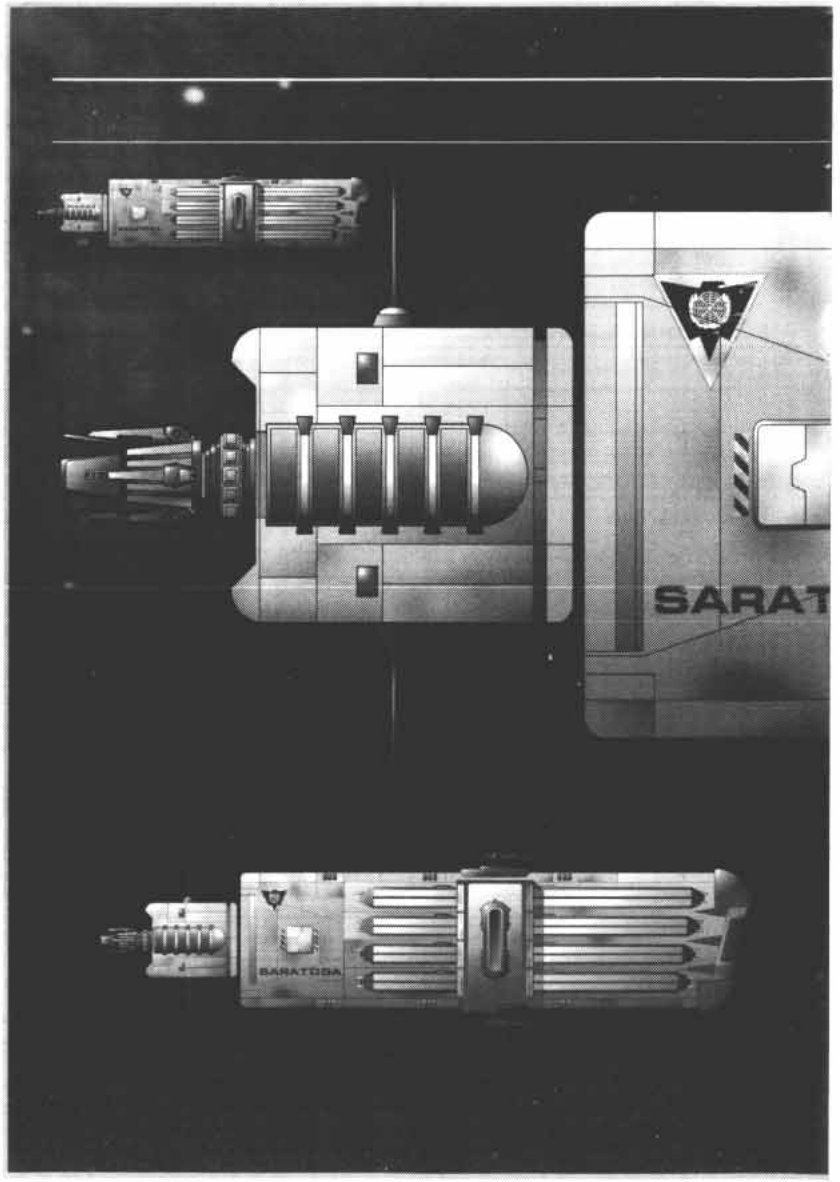
Name	Rating	Game Effect	Name	Rating	Game Effect
-					
-					
-					
-					
-					
-					
-					
-					

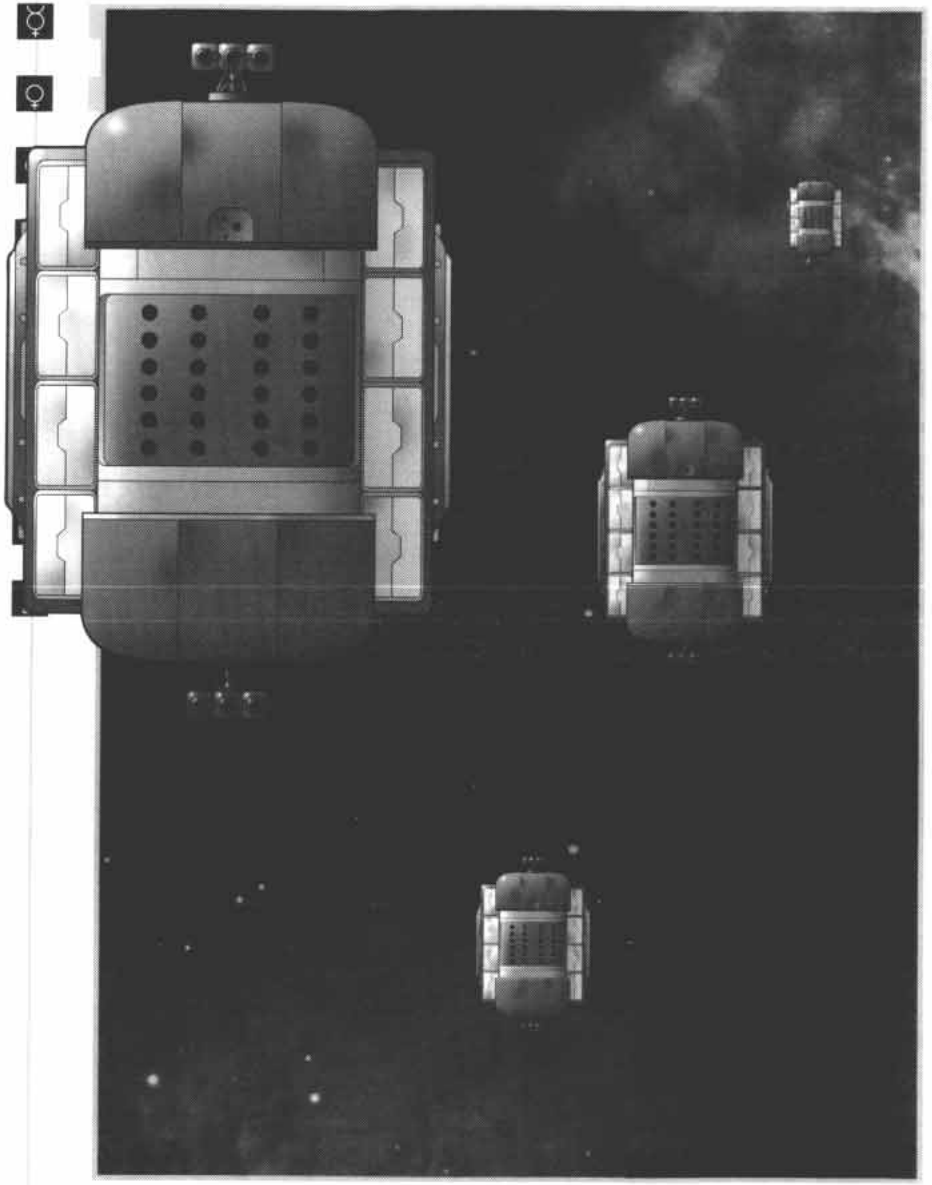
▼ Offensive and Defensive Systems:

Qty	Name	Arc	DM	BR	ACC	ROF	Ammo	Special	MS	WC	AC
-											
-											
-											
-											
-											
-											

Birmingham-class Attack Carrier

Name	Launched	Current Status
Birmingham	Sept 9, 2206	Reserve
Courageous	July 1, 2208	Fleet 5
Argus	Nov 30, 2209	Fleet 3
Shoho	Jan 17, 2210	Fleet 1
Hosho	Nov 25, 2210	Fleet 2
Hermes	Dec 19, 2210	Fleet 6
Graf Spree	April 9, 2211	Fleet 4
Kiev	Jun 2, 2211	Fleet 1
Kaga	Oct 19, 2211	Fleet 2
Minsk	Dec 27, 2211	Fleet 3
Nimitz	May 29, 2212	Fleet 4
Invincible	Jun 18, 2212	Fleet 5
Eagle	Aug 6, 2212	Fleet 6
Nabob	Oct 9, 2212	Fleet 1
Lexington	Dec 12, 2212	Fleet 2
Saratoga	Feb 9, 2213	Fleet 3
Shokaku	April 6, 2213	Fleet 4
Akagi	June 28, 2213	Fleet 5
Taiho	August 9, 2213	Fleet 6
Hornet	under construction	
Indefatigable	under construction	
Aquila	under construction	
Forrestal	under construction	
Centaur	under construction	
Ark Royal	commissioned	





▶ 4.1 OVERVIEW

Carriers have become a major influence on space combat doctrine in the last handful of years. Birmingham-class carriers are attack carriers: carrying exo-armors within attack range is their primary function. Unlike a strike carrier, they are unlikely to join the assault itself. Furthermore, they rarely engage in patrols, which is one of the primary assignments of escort carriers.

CEGA has long resisted the idea of using exo-armors as a principal force for attack, and thus the creation of a large carrier has been repeatedly delayed. The firepower brought to bear by sixteen exo-armors is proving to be incredibly powerful, however, and it seems likely that space warfare is following the same trends as twentieth century naval warfare did.

If this is so, the Birmingham-class attack carrier may be followed by a "barn" style carrier. Such a carrier uses a centralized hangar area, with only a small portion of the vessel given over to launch and recovery duties. Conceptual designs have been sketched out for vessels carrying thirty-two to sixty-four exo-armors. For this to come about, the Birmingham-class and her exo-armors must first prove the validity of the concept to skeptical CEGA admirals.

▼ 4.1.1 Capabilities

The Birmingham uses a "box and rails" philosophy. Small hanger "boxes," each capable of rotating two units into launch position, link into a system of catapults that cover the outer hull of the ship. With four boxes on each side, this CEGA attack carrier fields an entire squadron of sixteen combat craft. Each fleet currently operates three carriers; CEGA naval spendings have improved to the point where three new carrier may be added every year.

By transporting a full squadron, the Birmingham-class both simplifies and enhances exo operations. These benefits are felt in many areas, from the pilots, the technicians and the overall exo research and development programs.

Pilot briefings are much easier, since all of them can gather in one room. Furthermore, a host of additional pilot-related staff are now available. Flight masters are veteran pilots responsible for training on the onboard flight simulators. Planners specialize in evaluating risks and opportunities for any given mission. The actual operations are monitored by flight coordinators, each personally watching over a flight of four exo-armors.

The machines themselves are not neglected, for the importance of logistics cannot be understated: exo-armors require extensive support, materials and skills to keep running. A deck officer on each watch oversees all these activities. Each carrier has various workshops configured specifically for repairing the onboard craft. Watchful observers will note that the most advanced exo-armors go to the larger carriers first. These are the ones best suited to support the new exos, and are the best way of getting new designs to prove themselves in action.

Several attempts have been made over the years to fit the carriers with heavy anti-ship weaponry; "big gun" supporters still expect gun-based ship designs to go after the carriers. The poor performances of the jack-of-all-trade ship designs and the risk of accidental damage to a craft in the process of launch has led to the removal of all but the most basic defenses. Particle cannons in particular may blind a launching exo when firing, leaving the unit extremely vulnerable for a few critical seconds.

Standard capacity is sixteen exo-armors for the Birmingham-class. Squadron configurations fit into one of two roles. "Exo elimination" is the first function: the dreaded "EE" squadrons exist to destroy enemy small craft assets. Everything is centered around winning dogfights, thereby allowing the fleet to continue unhindered. Eight Wyvern or, if available, Cerberus exos operate as long range sniper, heavy combat and command units. Eight Furies operate as close-in and recon units, depending on their configuration. Due to the low number of Furies in service, however, the more common Syreens often replace them.

"Heavy attack," or "HA," is the second type of squadron. Heavily defended stations are their primary target, with enemy command ships rating a close second. Eight Wyvern Marines function as dual purpose defense and offense units. They keep the zone of operation clear to allow the four Wyvern Bombers of the third flight to engage the target. The fourth flight of four exo-armors is made of a pair of Cerberus, operating as command units, and two Fury exo-armors, operating as interceptors. Again, vehicle shortages often cause the Furies and cerberus to be replaced by the more common Wyverns and Syreens. Likewise, the Wyvern Bombers are sometimes replaced by fighter units loaded with anti-ship torpedoes, though their survival rates are extremely low.

▼ 4.1.2 Operational Role

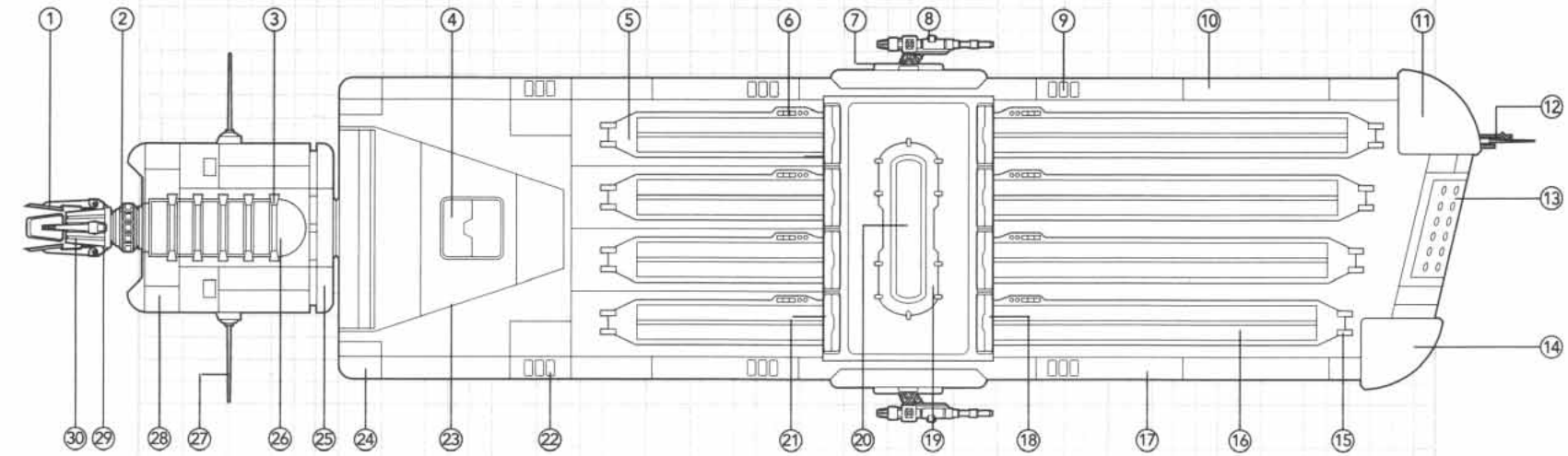
In CEGA naval operations a Birmingham-class attack carrier will never be found alone. While unable to carry heavy cannon itself each carrier operates paired with a Hachiman-class destroyer. This destroyer protects the carrier from attack and can operate as an emergency recovery vessel for the exo armors.

A handful of corvettes perform scouting duties for the carrier. Once a target is identified by the corvettes the exo armors will scramble to attack. It is not unusual to see one or more Hydra-class area defense boats operating with the carrier. These are especially useful as a deterrent against attempts to pursue the exo squadron when it is on the way back to the carrier.

The best exo-armors that CEGA can field are currently being redirected toward the Birmingham-class carrier; Tengu-class escort carriers are continuing to operate the older Syreen units. It is expected that the Birmingham will be used as a base of operations for advanced designs in the future. Work is underway to develop high-use catapults that can interface with an exo-armor as large as the Dragonstriker design.

▶ 4.2 SHIP SCHEMATICS

◐ Side View

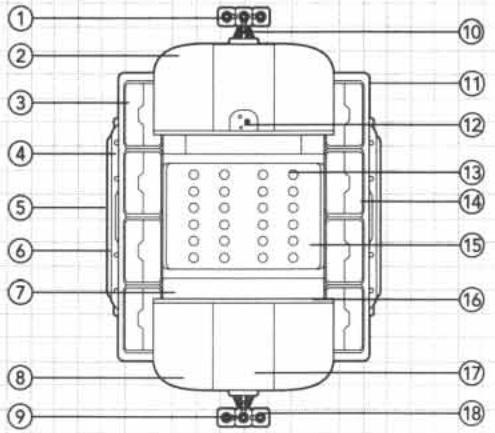


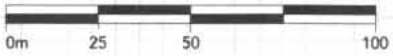
▼ Legend

1	Exhaust Collimators	11	Forward PDS Emitter Panel	21	Aft Bay Door
2	Fusion Core	12	Antenna Array (retracted)	22	Aft Escape Pod Covers
3	Structural Rib	13	Missile Launch Tubes	23	Structural Reinforcement
4	Shuttle Bay Door	14	Forward Sensor Cluster	24	Aft Sensor Cluster
5	Aft Runway	15	Runway Railguard	25	Rear Shield Generators
6	Flight Controller Signals	16	Catapult	26	Starboard Engine Pod
7	Upper KKC Hardpoint	17	Laminated Composite Armor	27	Field Sensor Antennea
8	KKC Turret	18	Forward Bay Door	28	Engine Mount/RAM Hardpoint
9	Escape Lifeboat Covers	19	Flight Bridge Housing	29	Hinge
10	Directional Sensor Panel	20	Flight Bridge (retracted)	30	Exhaust Coils

4.2 SHIP SCHEMATICS (CONT.)

Front View





Legend

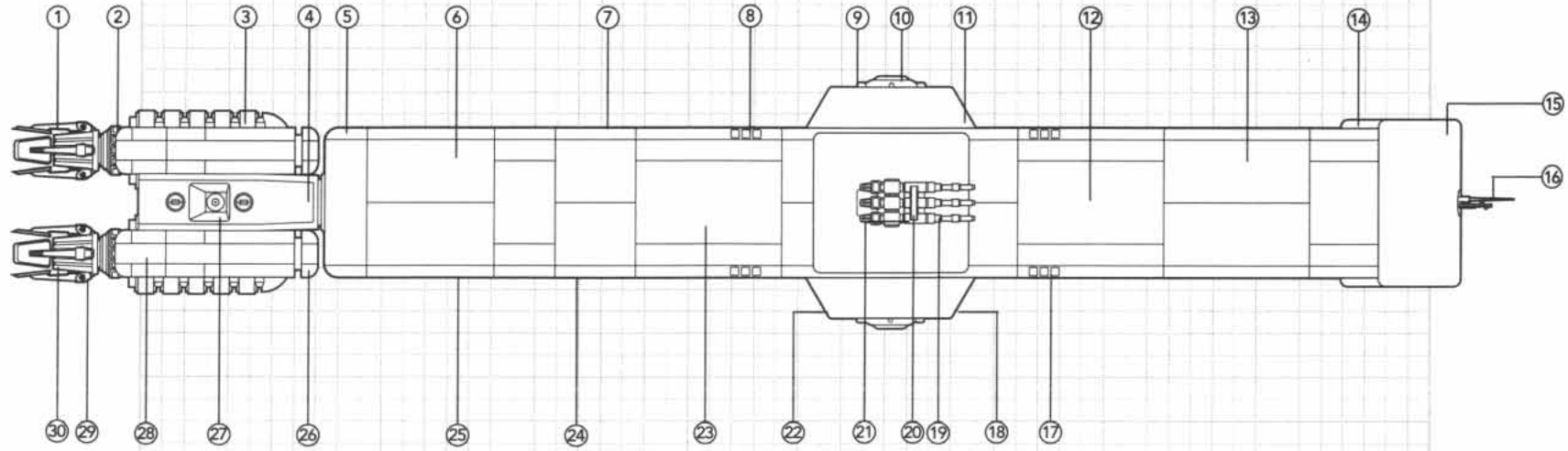
1	Upper KKC Turret
2	Forward PDS Emitter Panel
3	Forward Flight Bay Door
4	Flight Bridge Housing
5	Flight Bridge (retracted)
6	Structural Reinforcement Rib
7	Laminated Composite Armor
8	Forward Sensor Cluster
9	Beam Pointer
10	Upper KKC Hardpoint
11	Flight Bay
12	Antenna Array (retracted)
13	Missile Launch Tube
14	Pressure Seal
15	Missile Launcher
16	Structural Mounting Belt
17	Optical Shield
18	KKC Armored Housing

Specifications

Name:	Birmingham
Origin:	Central Earth Government & Administration
Manufacturer:	Various Shipyards
Type:	Attack Carrier
Control System:	Bridge w/astronomical display
Length:	409 m (436 m overall)
Width:	73 m
Empty Weight:	200,000 Tons
Loaded Weight:	250,000 Tons
Main Drive:	2 x 200 MW
Secondary Powerplant:	3 x 4000 KW
Main Thrusters:	2 x 60,000,000 kg
Apogee Motors:	65
Acceleration:	0.5 g
Onboard Sensors:	Fire Control Radar, Infrared/ Ultraviolet, Lidar, Magnetometer, Microwaves, Motion Detectors, Radcounter, Search Radar, Telescope
Fixed Armament:	PDS, 6 x Kinetic Kill Cannon, 1 x Missile Bay
Additional Armament:	Auxiliary Craft
Defensive Systems:	Mag Screen
Equipment:	Escape Pods

▶ 4.2 SHIP SCHEMATICS (CONT.)

◐ Top View

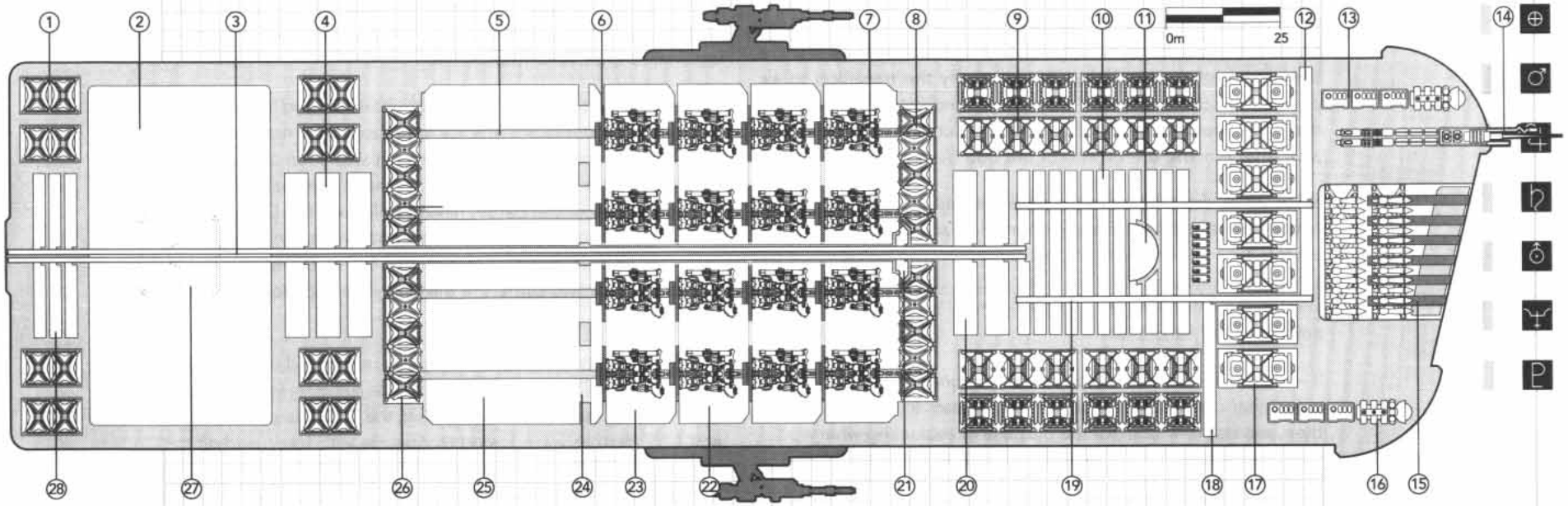


▼ Legend

1	Exhaust Collimators	11	Flight Launch Bay	21	KKC Turret Hardpoint
2	Fusion Core	12	Laminated Composite Armor	22	Aft Bay Door
3	Structural Rib	13	Upper Directional Sensor Panel	23	Structural Reinforcement
4	Engine Mount	14	Forward Sensor Cluster	24	Catapult
5	Aft Sensor Cluster	15	Forward PDS Emitter Panel	25	Shuttle Bay Door
6	Upper Directional Sensor Panel	16	Antenna Array (retracted)	26	Rear Shield Generators
7	Aft Runways	17	Escape Lifeboat Covers	27	Field Sensor Antennea
8	Aft Escape Lifeboat Covers	18	Forward Bay Door	28	Engine Mount/RAM Hardpoint
9	Flight Bridge Housing	19	Kinetic Kill Cannon	29	Hinge
10	Flight Bridge (retracted)	20	Beam Pointer	30	Exhaust Coils

4.2 SHIP SCHEMATICS (CONT.)

Cutaway View (Forward Hull)



Legend

1	Auxiliary Storage	15	Missile Launch Tubes
2	Shuttle Bay	16	Forward Sensor Cluster
3	Main Access Shaft	17	Superconducting Batteries
4	Workbays	18	Forward Lower Service Deck
5	Service Lift Shaft	19	Crew Elevator
6	Service Lift	20	Commons
7	Exo-armor	21	Observation & Control Room
8	Forward Storage Decks	22	Ready-Flight Launch Deck
9	Gas Storage & Heat Exchangers	23	Maintenance Launch Deck
10	Crew Quarters	24	Lower Hangar Access Airlock
11	Bridge	25	Maintenance/Storage
12	Forward Upper Service Deck	26	Lower Storage Decks
13	Avionics Bay	27	Shuttle Bay Door
14	Antenna Cluster	28	Workshops/Engineering

▶ 4.3 HISTORY

In the eighteenth century, naval warfare centered around ships of the line firing huge arrays of cannon at each other. In the nineteenth century the first armored turret designs appeared. These continued to hold sway until the twentieth century, where air power made such operations inadequate. The battle of Midway and the destruction of the battleship *Yamato* typify the transition to air power. Prior to this, carriers were poorly understood: it was only thirty-five years earlier that Eugene Fly's Curtiss struggled to get aloft after running off the end of the USS *Birmingham*.

Since 2210, the military has seen the acceptance by the Admiralty of the capabilities of exo-armors. Fast and agile, they render useless a number of weapons yet can inflict hideous damage on a warship. Furthermore, when one sends exos from a carrier they take on the risk leaving support, command and infrastructure elements out of harm's way.

It was extremely difficult to get the *Birmingham* program funded. In fact, her construction took over three years to complete. Even then, she was only built for the purpose of evaluating what would really be needed "if" CEGA ever decided to produce carriers.

The program to outfit the Tengu with her now-standard extra bays was seen as sufficient means for transporting exo-armors. While capable of low intensity engagements, the Tengu is limited by the size of her bays. She does come with a large crew/pilots ratio, an important resource for maintaining continuous patrols.

The CSS *Courageous* and CSS *Argus* followed each a year later. Still intended as concept evaluation vessels, the need for carriers had forced them into full military duty. Particle cannons were fitted to both carriers in an attempt to make them capable of standing in the line of battle; the hope was to provide both exos and heavy guns to the fleet. The two performed an important role by developing the standards for efficiently operating a full squadron in deep space.

A Jovian Armed Forces technician defected to Earth in 2207. A former Forge carrier deck hand, she brought with her an extensive understanding of carrier operations. This information was immediately integrated in the attack carrier program, which greatly benefited from it. Both governments keep her name secret for security purposes, but it is known that the Jovians have sent operatives to retrieve or remove her.

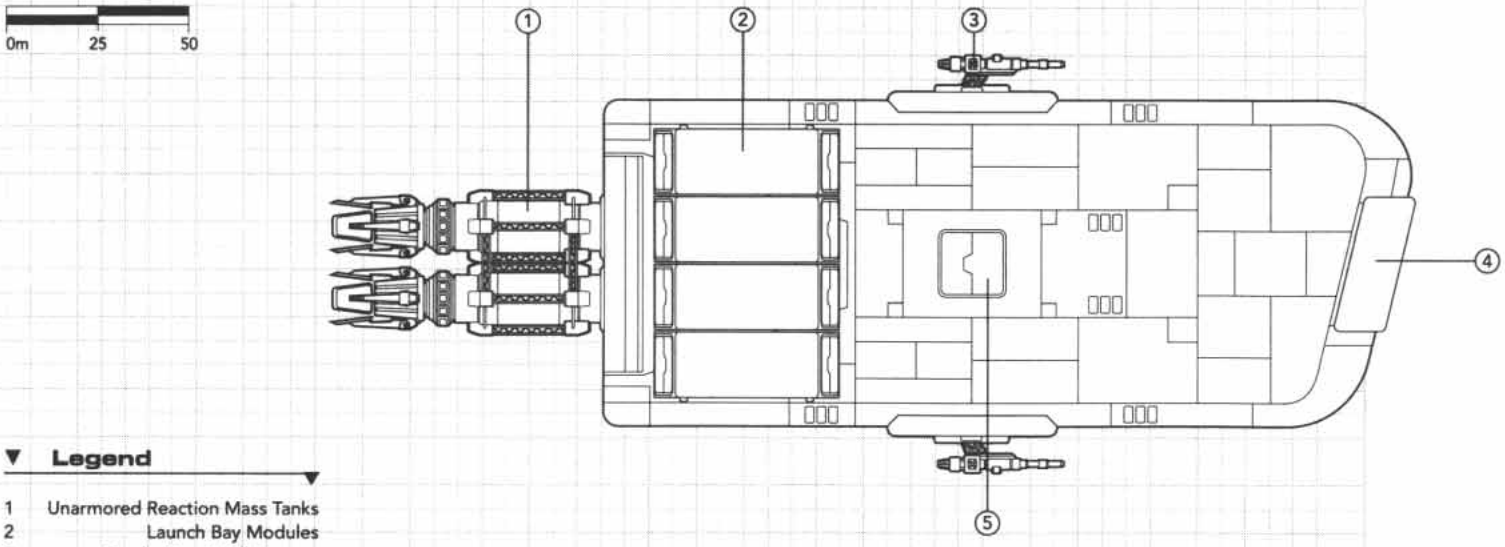
Beginning with the CSS *Shoho*, catapults were used for the launch and recovery operations. Internal operations were now sufficiently developed so as to be standardized. It was soon after that the Battle of Elysée took place. The CSS *Shoho* was making a return trip at the time of the battle, having delivered the Dragonstriker prototype to the CSS *Scylla*, but was not involved in the fighting. Increases in hostilities that began then led to the rapid production of the next two carriers in the class, the CSS *Hosho* and CSS *Hermes*.

Needs for repeated combat operations influenced the next carriers built. The hull was extended to provide sufficient storage space. With so many new carriers being built, the CSS *Shoho*, CSS *Hosho* and CSS *Hermes* were forced to operate with less than half the cargo space of the later designs. The CSS *Nimitz* is the first produced in the current configuration, which includes rear catapults for better recovery of exo-armors.

Several minor engagements involving the Birmingham-class vessels have taken place in the last three years. To date, none of the ships have been lost in action. This is an testament not only to the skill of the exo-pilots but to the carrier's escorts. It has become a mark of pride for the escorts to prevent any and all damage to their carrier.

CSS BIRMINGHAM

Birmingham-class Vessels, 2206-2208

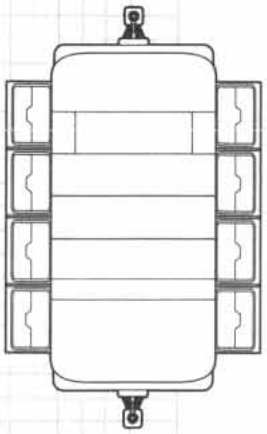


Legend

1 Unarmored Reaction Mass Tanks
2 Launch Bay Modules
3 Single Kinetic Kill Cannon
4 Forward Sensor Array
5 Storage Bay

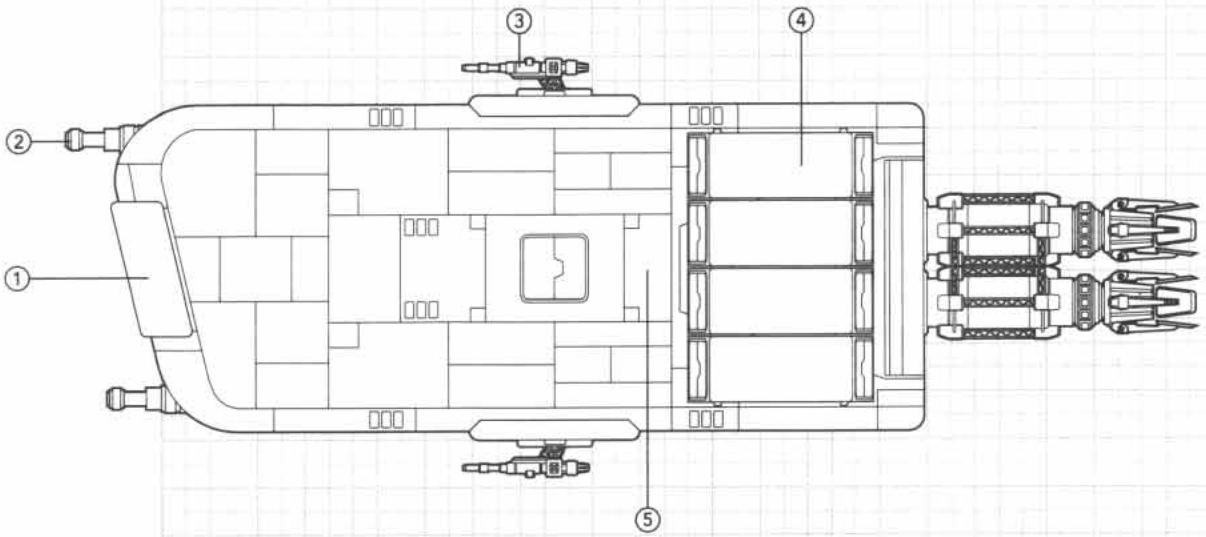
The ship pictured above is the CSS *Birmingham*. Like her ancient namesake, she was built as a testing ground for the use of new technology, in this case, exo-armors. Although carrier vessels already existed, they did not operate exos in the same number as the new attack carriers.

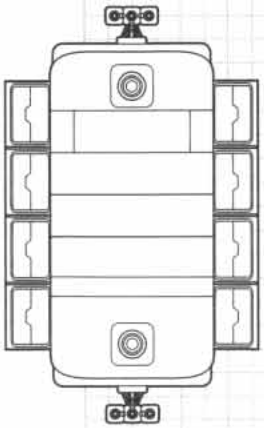
The *Birmingham*'s trial by fire was a nearly fatal situation. Rebels were attempting to destroy an L-5 space yard by ramming it with a shuttle. To save the exos' fuel, the carrier conducted an extended thrust sequence to engage in a lightning strike. As she approached, a pair of Syreens appeared from behind the shuttle. Although quickly dispatched, they drew away the ship's exos. Firing only its single-mounted KKCs, the *Birmingham* attempted to disable the shuttle. As the two passed at point blank range, the shuttle released a Harpoon missile which stuck the carrier amidship. A fire broke out as one of the master oxygen reserves was ruptured, causing a dangerous (but not fatal) fire. Though the shuttle itself did not survive to reach the yard, it is now suspected that its real target was the *Birmingham* all along.



▶ CSS COURAGEOUS

◐ Birmingham-class Vessels, 2208-2209





▼ Legend

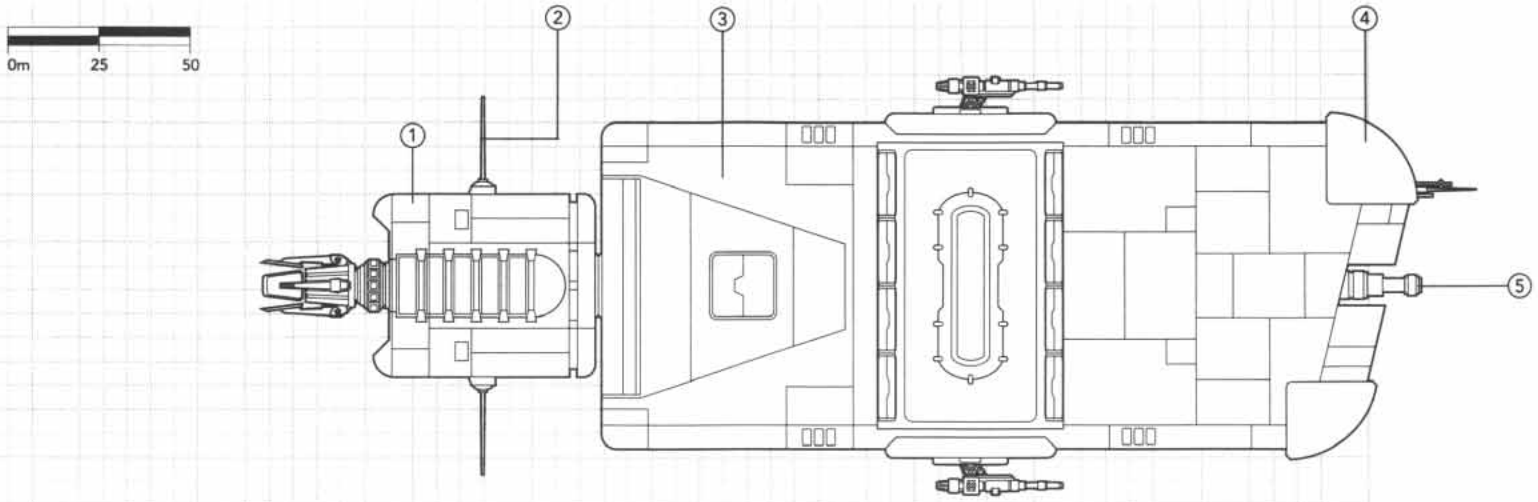
1	Upgraded Logic Systems
2	P56 Particle Cannon
3	KKC 3-gun Turret
4	Hull Launch Bays
5	Mid-ship Central Hangar

As with the CSS *Argus* which followed it, the CSS *Courageous* is the sole ship of her configuration. The issue of stores was resolved in favor of the more efficient but more dangerous central hull storage. Ready ammunition is maintained in the exo hangars, making the carriermore susceptible to magazine explosions. The ship also featured standard three-gun KKC turrets.

The CSS *Courageous*, above, was the first to receive the proper hanger bays. By flipping the hanger deck around, each bay may contain two exo-armors. It is this multiplier that allows the attack carrier to carry a full squadron of sixteen exos. This is a copy of the system used in the Jovian Forge-class carrier, on which this ship design was largely based.

CSS ARGUS

Birmingham-class Vessels, 2209-2210

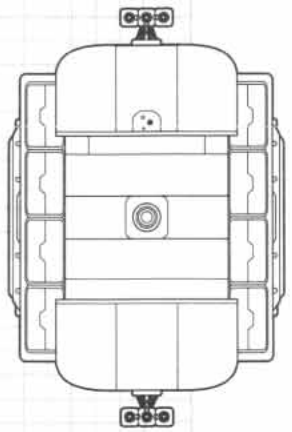


Legend

1	Armored Drive Engine
2	Field Sensor Antenna
3	Revised Work Bay Design
4	Forward Sensor Cluster
5	P56 Particle Cannon

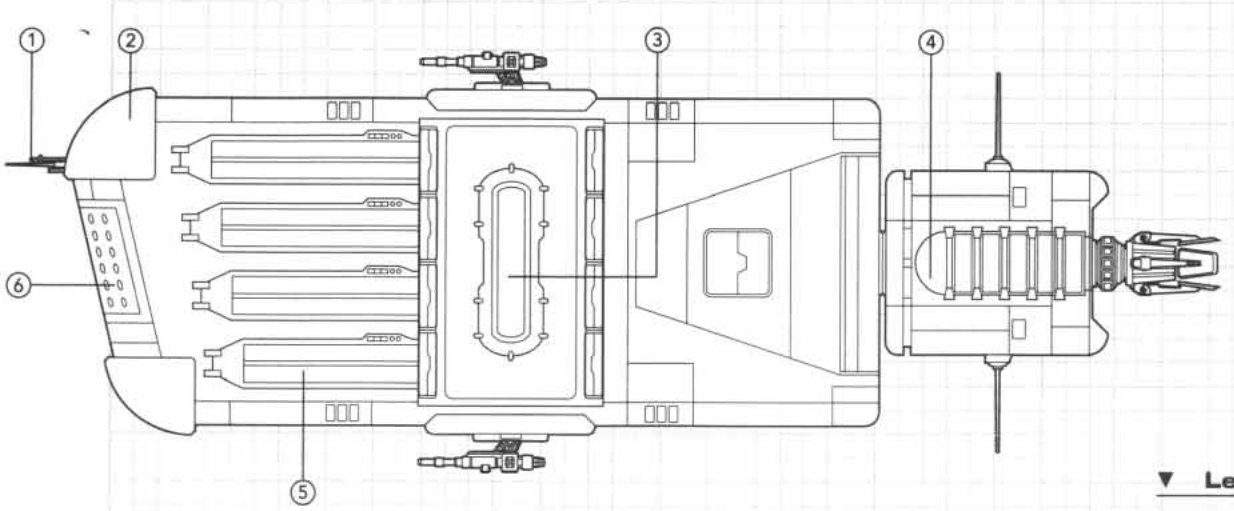
The CSS *Argus* appears as she did during the 2210 Benson & Hobbes Orbital Air Show. She shows the signs of the ongoing developments in carrier technique. The ship's engines are now covered with protective plates. The cargo bay door has been moved further aft, necessary for better launch performance. The launch deck, as it came to be known, is thus left free of possible obstructions. Landing lights have also been moved to the aft area where all landings are now conducted.

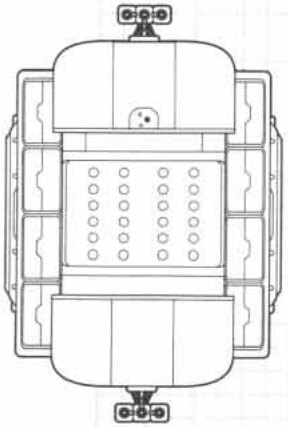
By mounting only a single central particle gun, it was hoped to avoid the previous problems where firing the guns blinded the ship's sensors for a brief moment. The need to have catapults for all hangars and launch bays would eventually force the removal of all heavy guns from latter carrier designs.



▶ CSS HOSHO

◐ Birmingham-class Vessels, 2210-2211





▼ Legend

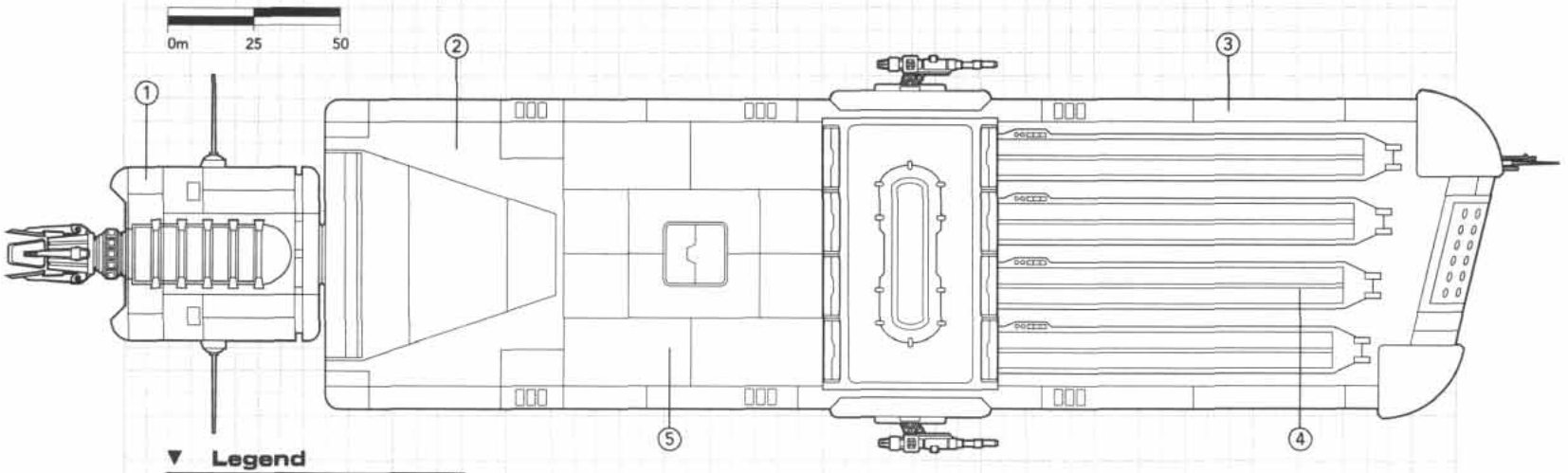
1	Antenna Array (retracted)
2	Sensor Array
3	Flight Bridge
4	Armored Drive Engine
5	Runway with Catapult
6	Missile Launcher

CSS *Shoho* was the first vessel produced in the fourth configuration. Conflicting ideas had been settled, and the carrier design focused on exo operations. Only the KKC turrets remain of the original armament, and these are far from the launch areas. A forward missile bay has been added. *Shoho* is assigned to the First Fleet and shows that carriers are now generally accepted by the Admiralty. This is due in part from changes in opinion and to the number of Admiralty posts that were changed after the Battle of Elysée.

CSS *Hosho* is also named for a Japanese carrier of World War II. Although accepted now, the Birmingham-class, like the Constantinople-class, was originally not permitted to use mythological names like most of the CEGA vessels. CSS *Hermes* was rushed into production along with the *Hosho*. It was feared that the Jovian Armed Forces might respond by sending their own exo prototype to attack a CEGA colony. It was on these ships that the first Exo Eliminator squadrons came into existence.

CSS GRAF SPREE

Birmingham-class Vessels, 2211-2212

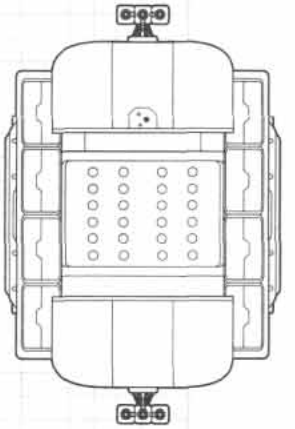


Legend

1	Armored Drive Engine
2	Extended Hull
3	Additional Crew and Work Spaces
4	Extended Runway
5	Redesigned Cargo Bay

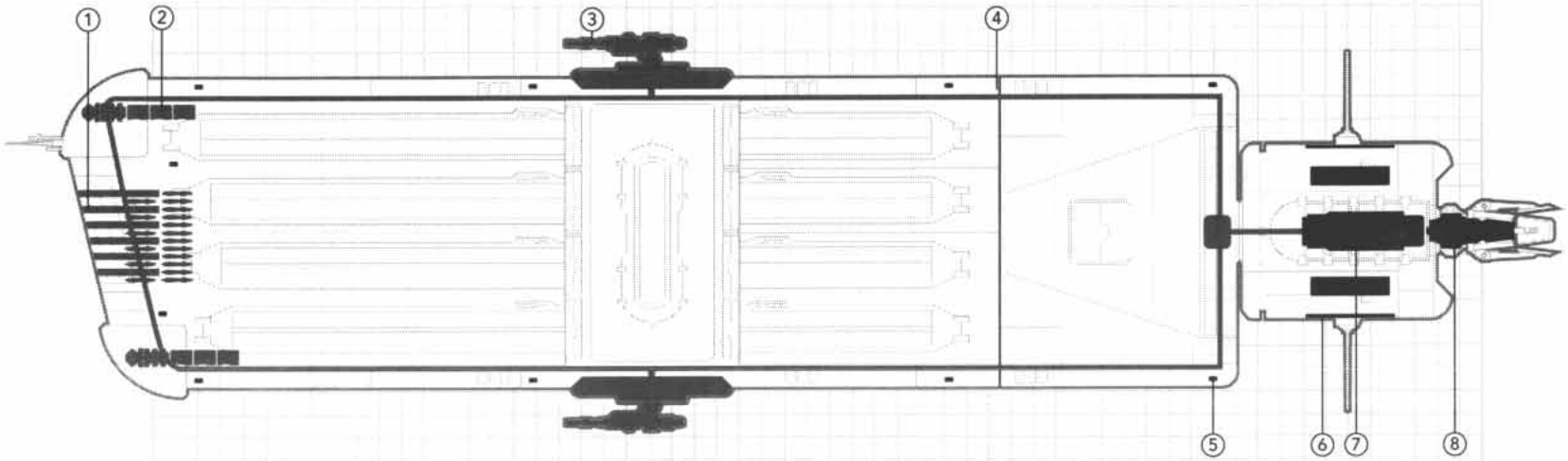
The overall design was greatly revised in 2211. Extensions were placed in both the forward and aft hull: the former adding catapult length, crew accommodations and work bays, the latter adding to the cargo space. The additions to the carrier were to allow more frequent large squadron operations. Four carriers were produced in the same style as the CSS *Graf Spree* above.

The CSS *Kiev* was the second carrier almost lost in battle. In 2212 the *Kiev* and the *Farraday*, a Jovian Forge-class vessel, crossed paths. It was learned that the angst-ridden pilot "Tailgate the Butcher" was onboard; the pilot was reputed to be singlehandedly responsible for the death of over one thousand people, many of them civilians. Neither carrier was alone and an intense fight took place, with even the escorts getting involved. *Kiev* would have been unable to escape had not one of her corvettes rammed the *Farraday*'s engines. Both carriers managed to limp away to friendly ports.



▶ 4.4 SHIP SYSTEMS

◐ Propulsion and Weapons



The "saddle bag" exo-armor bays and rows of catapults make it easy to identify this CEGA carrier. As with other specialized ships, the primary purpose of the vessel dominates all external fittings of the hull. Launching, recovering, rearming, and repairing the exo-armors and fighters are assured through large hangar facilities located in the center of the ship. These are followed by facilities for the workbays, flight control and training simulators needed to keep the squadrons operating at peak efficiency.

The forward hull houses primarily the crew quarters and the sensor systems. Most of the crew quarters are located just above the vehicle bay. The large amount of volume required in the midship area for handling large exo-armor components and other bulky cargo forced this. A missile bay in the bow provides part of the ship's limited firepower.

▼ Weapon Systems

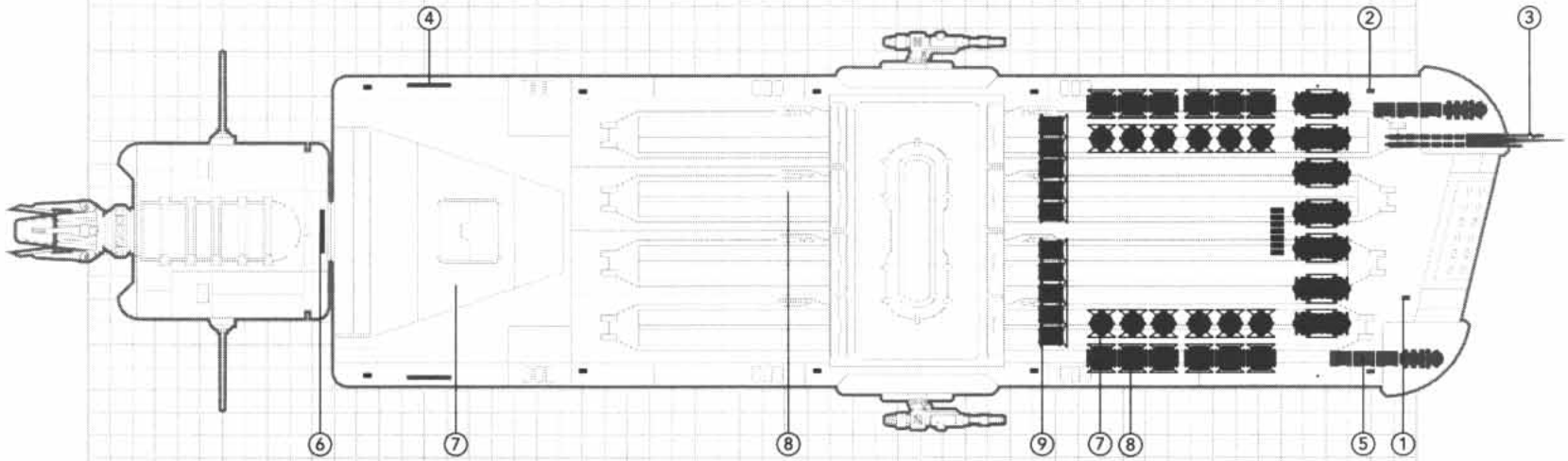
1	Missile Launch Tubes
2	PDS Emitters
3	KKC Turret
4	Aft PDS Emitter Ring

▼ Propulsion Syst.

5	Plasma Arc RCS Cluster
6	Radiator Panels
7	Reaction Mass Tanks
8	Plasma Combustion Chamber

4.4 SHIP SYSTEMS (CONT.)

Sensors and Life Support



Sensor Systems

1 Short-wave instrument clusters
2 Docking Sensors
3 Microwave Pulse-ranging Antennae
4 Phased Array Radar
5 Laser Ranging and LIDAR Emitters

Life Support Syst.

6 Shield Generators
7 Forward Gas Storage
8 Crew Quarter Heat Exchanger
9 Bulk Storage

The hanger bays take up most of the outside of the ship's middle. In truth, however, only a small part of the bay is built outside the hull proper. Internal rotating decks and powerful elevators move exo-armors to and from the main hull hangars. The lower hangar is roomier and features more extensive repair resources. Work areas have been specialy designed to work on such items as exo-armors' limbs, and are located just under the lower storage decks; elevators bring the parts down.

The aft area of the ship is dominated by cargo areas. In emergency, these can serve as exo-armor recovery and repair hangars, though they are poorly suited for it. Sturdy bulkheads subdivide the volume to reduce damage caused by internal explosions and decompressions. Finally, an armored shell encloses the tail-mounted plasma drive for enhanced protection.

▼ 4.4.1 Exercise Room

Sharp reflexes and good muscle tone are mandatory for pilots. Lacking simulated gravity areas, the Birmingham-class offers a variety of exercise rooms. These contain a wide assortment of exercise machines to keep up crew fitness. Pilots must log their workout times on the machines: this information is combined with weekly physical exams to determine any necessary adjustments to the pilot's physical exercise program.

One of the areas can be configured as a regulation court for bounceball. This popular sport is a null-gee version of a game called hacky-sack. Players are forbidden to use their hands, but may use any other body part such as elbows, forearms, feet or hips to bounce a rubber ball. Points are scored by sending the ball into hoops on the walls. To avoid player collisions, all participants are tethered by a cord which limits their reach. The game has also been described as three-dimensional pingpong.

▼ 4.4.2 Hangar

Each of the ship's eight hangar flight bays accommodates two exo-armors. Normally, a pair of the same type of exo will be loaded into a bay to use the same sets of spare parts. Thus, most flights take two launch sequences at most to get airborne. A flip-deck style system swings the exo-armors between the two internal bays. When the launch bay is swung into the main hangar, a deck hand can access larger tools for activities that would disable the exo-armor, such as overhauling the fusion plant or removing a limb.

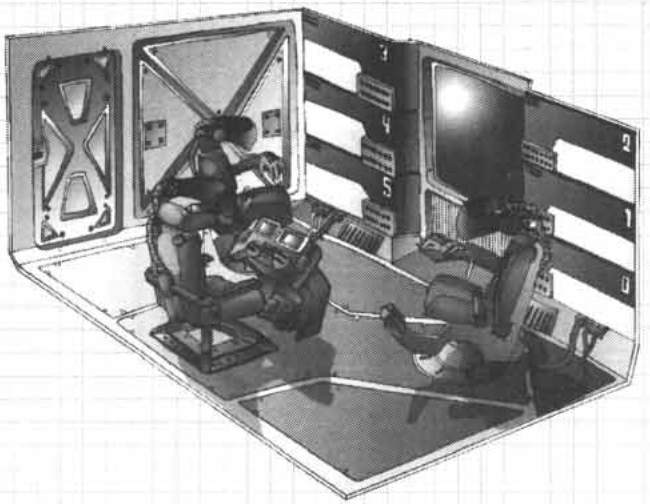
The hangar position nearest the catapult is primarily arranged for loading consumables and ammunition onto the exo-armor. Exos carry a variety of powerful munitions, and proper care and handling is vital; all quartermasters must maintain security certificates to serve on a carrier. In the event of an accident, the munitions bays are designed to blow outward from the ship. Even the corridors approaching it are built with twists and turns to deflect the blast away from important areas of the ship.

▼ 4.4.3 Flight Control Room

This room resembles a small-sized bridge. In addition to the numerous situation display boards, the room features a supervisor station and multiple flight controller seats. These terminals access the communications network, where various channels can be monitored and relayed to the pilots.

The flight controller seats can swivel in all directions. Each flight controller wears a VR helmet, allowing them to view their teams in any direction they face. Various tactical data can be called up on the faceplate element. When exo-armors are in communication with the carrier, the flight controller can access their damage reports to plan in-flight damage control recommendations.

When an exo flight is launched, the flight controller functions as a link between them and the rest of the fleet. Transmission of data files lets the pilots receive new navigation plots, updated intelligence or even light entertainment on long distance missions.



▼ 4.4.4 Limb Repair Shop

Rather than take up important hangar space with a non-functioning limb, the damaged unit is moved to a separate workshop. Here the limb is repaired for service, while in the meantime the exo can often have a replacement limb reattached quickly, allowing a faster return to flight readiness.

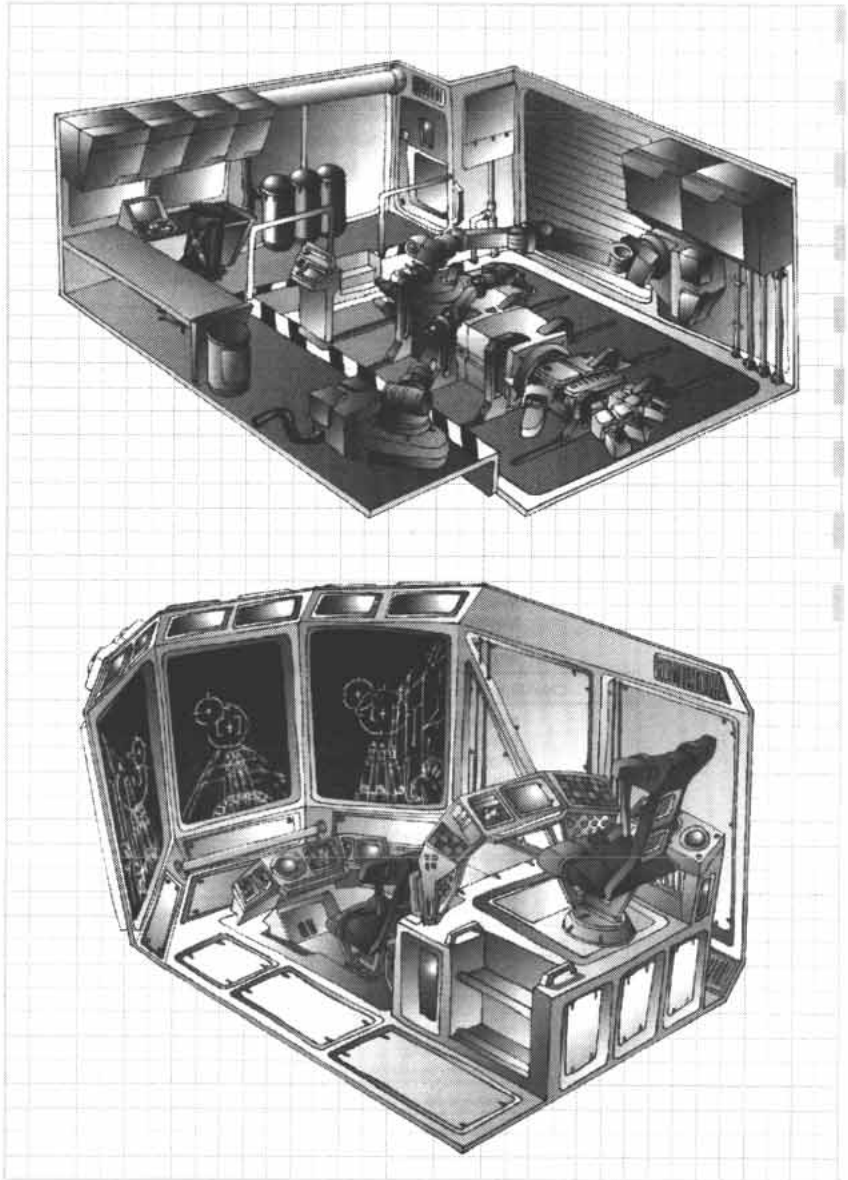
Limbs are held in place by strong restraints, in case the ship has to thrust suddenly. Numerous robot arms carry tools or can manipulate heavy items, or hold them in place. All this is intended to increase the efficiency of the technician.

A variety of testing mini-labs lets items and repairs be evaluated for possible defects. Limbs are checked for strength and movement response before being sent back to the hangar for installation. Many parts can be manufactured there, including the internal structural members of a limb, on the ship's autofacs.

▼ 4.4.5 KKC Turret Control

Modern Kinetic Kill Cannon turrets offer much greater performance over the old single mounts. Possessing three times the weapons, the turrets are also more spacious and offer better crew access to the equipment. Each turret contains its own power and fire control systems; if necessary, a turret may operate even if the main hull is disabled, and can even act as emergency shelters in a pinch (though only for short periods of time).

The crew of a KKC turret normally consists of three people. One of the gunners is the team leader and is responsible for firing the weapon. He uses a helmet like those used in the Flight Control Room. As with their helmets, it is designed to communicate with spacesuits so the crew may fight in a total vacuum (the standard combat condition). The other two are KKC specialists: one sits just below the gunner to monitor the operation of the turret's systems, and the other acts as a mobile technician, addressing the effects of battle damage and wear as needed.



▶ 4.5 SHIP PERSONNEL

The crew of the carrier is grouped under a small number of departments; Operations under the captain and the first officer, Gunnery under the chief gunner and Engineering under the chief engineer. The Flight and Marine departments have their own command structure and report directly to the captain.

Crew Organization Chart

Captain	
First Officer	
Watch Officer	2
Sensor Specialist	2
Communication Specialist	2
Helmsman	2
Quartermaster	4
Medic	2
Steward	4
EVA Specialist	4
Chief Gunner	
PDS Specialist	2
Missile Gunner	2
Missile Specialist	2
KKC Gunner	2
KKC Specialist	4
Chief Engineer	
Master Engineer	2
Bosun	8
Engineer	8
Deck Officer	2
Master Deck Hand	8
Deck Hand	16
Actuator Specialist	8
Electronic Specialist	8
Ordnance Specialist	10
Catapult Specialist	4
Computer Specialist	2
Squadron Commander	
Flight Leader	3
Pilot	12
Flight Master	1
Mission Planer	4
Flight Controller	8
Simulation Specialist	2
Marine Commander	
Squad Leader	2
Marine	17
ES Marine	8

▼ 4.5.1 Interview with a Pilot

Name:	**Francine Marsellies**
Rank:	**Ensign**
Current Assignment:	***CSS Lexington***

"Serving in CEGA is more than a duty, it is an honor. The tales of knights in shining armor have once more become true, except that the chosen few now operate exo-armors instead of riding white steeds. We risk our life over and over again so that someone we have never met can stay safe. Space is a dangerous dragon that we tame daily.

"I did two tours on Tengu-class escort carriers before joining an attack carrier. The intensity of operations is quite different. On the Tengu we might average a mission a day, here I fly one real mission a week but a dozen simulated ones every day. There is nothing so magnificent as seeing an entire squadron move with precision through a battle plan that has been rehearsed for two months.

"When you met our Flight Master I can guarantee that you will underestimate him. If you ever see him in a dress uniform you will understand by his decorations who he really is. Natural reflexes decline with age. Veteran pilots with one or two things found out of line in their physical exams stand a good chance of becoming Flight Masters. Never suspect them of being unable to fight, though . . . our entire squadron was once obliterated by our flight master in a simulated battle.

"After completing this tour I will probably not be allowed to stay on the carrier. Instead they'll send me back to a Tengu as a flight leader. In many ways, attack carriers are our mobile advanced flight academies."

▼ 4.5.2 Interview with an Actuator Specialist

Name:	**Annand Date**
Rank:	**Shipman**
Current Assignment:	**CSS *Nabob***

"Hey there. I'm what you call an actuator specialist. Heck of a thing to spell right. You see your arm? All the muscles inside it weave around the bone to twist your hand about. Did you know that muscles only work by pulling? Well, imagine doing something like typing just by pulling on a set of ropes.

"Exo-armor limbs are tricky. They have gears and hydraulics in places that can push as well as pull. That helps. Thing is, we have to stick it all under armor plates. Your skin flexes around your muscles; in an exo, if something moves out of place it will jam up on something else.

"So they have folks like me. First, I was a general technician. After some more training they called me a deck hand. Taken me a year to get them to stop calling me that! There was a whole mess of classes back at the academy that they put me through, and now I'm an actuator specialist.

"I still got to do a lot of the jobs I did before. See, there are only so many people on board a ship. So if the armor is banged up real bad, us 'specialists' act as deck hands to fix it up quick. But when the elbow system is broken underneath, they gotta have someone like me who knows about all the tricky bits to do it.

"What am I going do when I get out? Well you see there are exo type units used all over the Belt for mining. Sure, you can melt a rock or blast it apart with a laser. Something still has to pick up the bits. So you may just see me on an Anopheles . . . those captain's appreciate a good actuator specialist, yes sir!"

▼ 4.5.3 Interview with a Flight Controller

Name:	**Anna Agilova**
Rank:	**Petty Officer**
Current Assignment:	**CSS *Minsk***

"What you need to realize is that we do more then line up docking vectors. We have to monitor the exo-armors and pilots, everything. Gets to be a habit: before you know it, you will be watching the pilots in the galley to see how much food they eat. Why? Because the bigger they are, the more reaction mass their exo will use. It rarely comes down to that little of a margin, but . . . <laugh>

"One of the most important things for you will be the relationship you have with the pilots in your flight. If you don't get along with the crew, someone's going to get transferred, and it won't be the pilots. Space is a lonely place, especially for someone trapped in a bubble little bigger than the spread of your arms. When they are out in space we are there as their only human contact.

'That's why each four-man flight has two flight controllers. On long missions, one of us will always be around to keep in touch with the pilots. This is also important, as battle conditions can change any time. Its our responsibility to keep the pilots updated.

"I will be honest though . . . once one of my Cerberus pilots had an arm and leg blown off. When my VR helmet zoomed in it was like seeing my spouse all broken up by a car accident. The pilots start becoming part of your life. The pilots know this and they know you're part of their team.

"When the pilots are running sims, we're involved too. Everything simulates how the battle will be in real life. The goal of the Flight Masters is to make the training harder than the real thing."

▶ SWIRLS OF BATTLE

Captain Alison Date stared into the spherical ceiling of the bridge, running mental tallies of the morning's events. One marine team had succeeded in landing. The Jovians were not going to let it be that easy to capture the *Duke*, though. Twelve Jovian exo-armors had moved up alongside the destroyer *Ghengis Khan* to protect the transport ship.

She sighed, softly. Why did it always have to come down to this? Human against human, all for what? None of it made sense. But then, did war ever have to make sense? She shook herself out of her reverie.

"Launch."

The screen blazed white with the energy signatures of two waves of launching exo-armors — sixteen in all. The squadron was an exo elimination team, a combined force of Fury and Cerberus exos. The area defense boat leapt ahead with them, hoping to add its firepower to theirs. The landing cutter moved up behind, waiting for an opening to take its troopers up to the transport and board it.

The Jovian's response was immediate. The CSS *Toshiro* took a scalding hit, knocking out one turret. Angered, both the *Toshiro* and *Aname* began pounding back, their guns blazing. Each side's exo-armors dashed forward, eager to join the fray.

Date watched in horror as the *Ghengis Khan*'s next barrage sank into the tiny area defense boat. Arcs of energy crackled over the boat's hull as she began drifting, mortally wounded.

Missiles swarmed across the heavens. Railgun and particle fire from the warships and exo-armors danced through space, tiny flares marking hits. "Vindicator breaking through!" screamed one of the bridge crew.

She saw it in time to see the exhausts of heavy missiles sliding out of the shoulder rails of the Vindicator. The *Aname* was less than a hundred meters away. Unable to protect itself with her point defense grid, the ship was jolted by the attack. Flames billowed out of her side for a moment then ceased as the oxygen in ruptured tanks exhausted itself.

A corvette was thrusting hard to catch the Vindicator. The lone Bricriu fired her beam cannons, and after a few misses sped off into the void, they struck home on the heavy Jovian exo-armor. An escape pod popped out before the Vindicator exploded.

"I want that pilot taken prisoner," Date ordered sharply. "Send a Minotaur flight to retrieve him."

"Yes sir," came the reply, closely followed by, "landing cutter is aborting mission. Repeat, cutter is aborting interception. The zone's too hot."

Date looked back at the CSS *Toshiro*. The CEGA warship had managed to swing up beside the *Ghengis Khan*. The Jovian destroyer had heavy bow armor and heavy frontal weapons, and it was being forced to keep its front pointed squarely at the *Toshiro*.

A Fury dove across the screen, its shoulder-mounted plasma blades lighting the sky like a torch. Twisting around the *Ghengis Khan*, it sheared off one of the laser wings.

"Pathfinder pursuing the cutter," an ensign shouted.

In a desperate move, the fleeing cutter began to disgorge the exo-suits on board. Alone, they were no match for an exo-armor, but now there were sixteen exo-suits locking themselves onto the

outside of the cutter's hull. The threat of their massed firepower was enough to force the Pathfinder to thrust away. A corvette beside the *Iwo Jima* moved forward to cover the tiny vessel as it came back under the protective shadow of its mothership.

Captain Dates was lost in the swirls of battle, her exo flights guided by the traffic control center, not by the bridge. As a carrier captain, she had little choice in battles such as these.

A voice grabbed her attention "Long range scan detecting squadron burn on intercept course. Valiant-class ship detected. . . could be a Majestic, though. At least one more destroyer, too. They're firing off a lot of fluff to shadow their formation."

Goering's voice cut in over the commotion. "We are accepting a ceasefire offer from the Jovians. Move in to dock with the colony. South docking area is under our control. *Lexington*, keep a team of Cerberus around the last cutter as she moves in to reinforce the troops on the station. Captain Date, I place you in charge of rescue and prisoner exchange."

"Acknowledged, commodore," she forced out through gritted teeth. "Flightmaster, what were the results of the small craft engagement?"

The radio replied, "counting six Jovian exo-armors lost to our three. Four Jovian pilots ejected. Two of ours made it out. We lost Granite to the Ghengis Khan. Heavy damage inflicted on the Khan by our exos."

Date couldn't even give herself a moment of grief for her lost shipmates. "Return the captured Jovians to the *Khan*. Ask her to do the same for our pilots, and send a corvette to the ADB with a rescue party. Bring us alongside the *Aname*. Damage control parties, prepare to disembark to aid the *Aname*. Prepare a Fury for recon duty. I want a Sparrow drone out there and ready for area reconnaissance yesterday."

The dockyard was in shambles. Explosions and gunfire had ripped through the place, and debris lay everywhere. Sparks flew from where David was welding a temporary airlock over the door he had blown open earlier. Lieutenant Sharpe strode over to the other landing cutter as it approached.

Beside the cutter, two red Cerberus clamped onto the colony's hull. They turned to watch a pair of Venusian Ryus touch down gracefully fifty meters away. The two sides watched each other warily, twitching at every sign of movement.

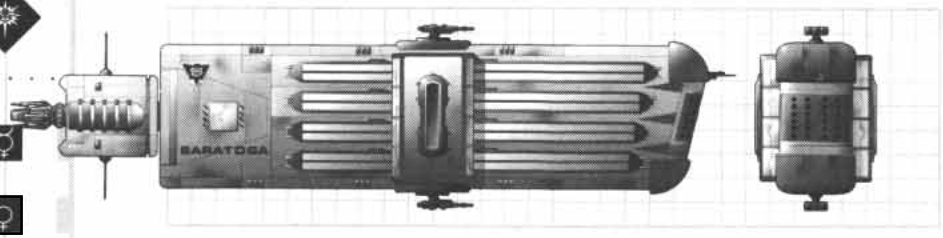
"Welcome to town," Sharpe commented wryly as marine captain Tark stepped down the ramp. Rows of infantrymen marched past, intent only on their destination.

Tark chuckled, "Lovely town you have here, Sharpe. Pity we can't stay for tea."

"At least take the entertainment," replied Sharpe pointing to a far corner. A number of life support-fitted crates were stacked along the wall, being used as prisoner cages. Curses turned the air blue as those interred struggled to free themselves.

"Dare I even ask?" Tark's eyebrow was raised as he took in the sights.

"It was simple, really. . . We had them trapped in the dockyard, and the mayor of the colony refused to allow the smugglers to enter the inhabited areas. Trapped between a handful of marines and two dozen colony E-Swat exo-suits, the troublemakers were quick to give in. Easiest capture so far!"



▶ Birmingham-class Attack Carrier

▼ Overall Data:

TV: 110,000	Off. TV: 57,000	Def. TV: 2500	Misc. TV: 270,000	Cost: 146 M	Indv lemon dice: 3

▼ Movement Data:

Mode: Space	Combat: 4 (0.4g)	Top: 8 (0.8g)	Maneuver: -3	Range: 3,000 hrs	Re.Mass:2,000 BP

▼ Sections:

1 x Main Hull	2 x KKC Turret	2x Drive

▼ Off & Def Systems

1 x Point Defense System (main hull)	1 x Missile Bay (main hull)	6 x Kinetic Kill Cannon (turret)

▶ Section: Main Hull

▼ Main Data:

TV: 80000	Off. TV: 10000	Def. TV: 720	Misc. TV: 270,000	Cost: 97 M	Indv lemon dice: 3
Crew: 54	Actions: 9	Sensors: 0/4 km	Comm.: 0/20 km	Fire Control: 0	Type: Early Prodc.
Hull Size: 80	Default Size: 43	Base Armor: 50	Light: 50	Heavy: 100	Overkill: 150

▼ Movement Data:

Mode: Towed	Combat: -	Top: -	Maneuver: -	Range: 2,000 hrs	Re. Mass: -

▼ Perks & Flaws:

Name	Rating	Game Effect	Name	Rating	Game Effect
Autopilot	-	Lvl 1 pilot	Reinf. Crew Comp.	2	Absorbs first two "Crew" hits
Backup Sys	3	Comm, Fire Con, Life Sup, Sensor	Satellite Uplink	-	x1000 Comm range
Computer	4	CRE 0, KNO 0, PP 4	Cargo Bay	-	20,000 m³
Ejection System	-	250 places	Cargo Bay	3	82,000m³
HEP: All	-	Sealed	Sick Bay	4	Zero-Gravity Medbay
HEP: Radiation	4	Screen	Catapult x 8	3	(450/mass) m/s²
Life Support	-	Full	Lab	2	Electronics, Mechanics, Tactics
Passenger Accom	-	25,000 m³	Lab	1	Teaching

▼ Offensive and Defensive Systems:

Qty	Name	Arc	DM	BR	ACC	ROF	Ammo	Special	MS	WC	AC
1	PDS (ranged)	T	x10	1	+1	6	inf	AM, Heat	15	7400	n/a
	PDS (shield)	FF	x20	M	+1	0	inf	Def., E-shield, Heat	3	75	n/a
1	Missile Bay	T	x30	5	-2	5	30	Mis, G, Concealed (N.A.)	14	6000	18

▶ Section: KKC Turret

▼ Main Data:

TV: 8000	Off. TV: 23,000	Def. TV: 250	Misc. TV: 800	Cost: 8 M	Indv lemon dice: 3
Crew: 3	Actions: 3	Sensors: -5/2 km	Comm.: -5/10 km	Fire Control: 0	Type: Early Prodc.
Hull Size: 19	Default Size: 20	Base Armor: 20	Light: 20	Heavy: 40	Overkill: 60

▼ Movement Data:

Mode: Towed	Combat: -	Top: -	Maneuver: -	Range: 1,000 hrs	Re. Mass: -

▼ Perks & Flaws:

Name	Rating	Game Effect	Name	Rating	Game Effect
Backup FireCon	-	Absorbs first "FireCon" hit			
HEP: Radiation	4	Screen			
HEP: Vacuum	-	Sealed			
Life Support	-	Full			
Reinf. Crew Comp.	1	Absorbs first "Crew" hits			
Weapon Link	-	All kinetic kill cannons			

▼ Offensive and Defensive Systems:

Qty	Name	Arc	DM	BR	ACC	ROF	Ammo	Special	MS	WC	AC
3	KK Cannon	L/R	x25	6	-2	3	300ea	AP	6	4800	8.4

▶ Section: Drive Module

▼ Main Data:

TV: 5500	Off. TV: 0	Def. TV: 770	Misc. TV: 80000	Cost: 5.6 M	Indv lemon dice: 3
Crew: 4	Actions: 4	Sensors: -5/2 km	Comm.: -5/10 km	Fire Control: 0	Type: Early Prodc.
Hull Size: 46	Default Size: 18	Base Armor: 50	Light: 50	Heavy: 100	Overkill: 150

▼ Movement Data:

Mode: Space	Combat: 23 (2.3g)	Top: 46 (4.6g)	Maneuver: -3	Range: 3,000 hrs	Re.Mass10000 BP

▼ Perks & Flaws:

Name	Rating	Game Effect	Name	Rating	Game Effect
Backup Sys.	2	Comm, Fire Con, Life Sup, Sensor			
Ejection System	-	12 places			
HEP: Vacuum	-	Sealed			
HEP: Radiation	4	Screen			
Life Support	-	Full			
Reinf. Crew Comp.	2	Absorbs first two "Crew" hits			

▼ Offensive and Defensive Systems:

Qty	Name	Arc	DM	BR	ACC	ROF	Ammo	Special	MS	WC	AC

▶ Section:

▼ Main Data:

TV: -	Off. TV: -	Def. TV: -	Misc. TV: -	Cost: -	Indv lemon dice: -
Crew: -	Actions: -	Sensors: -	Comm.: -	Fire Control: -	Type: -
Hull Size: -	Default Size: -	Base Armor: -	Light: -	Heavy: -	Overkill: -

▼ Movement Data:

Mode: -	Combat: -	Top: -	Maneuver: -	Range: -	Re. Mass: -

▼ Perks & Flaws:

Name	Rating	Game Effect	Name	Rating	Game Effect
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-					
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-					

▼ Offensive and Defensive Systems:

Qty	Name	Arc	DM	BR	ACC	ROF	Ammo	Special	MS	WC	AC
-											
-											
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▶ Section:

▼ Main Data:

TV: -	Off. TV: -	Def. TV: -	Misc. TV: -	Cost: -	Indv lemon dice: -
Crew: -	Actions: -	Sensors: -	Comm.: -	Fire Control: -	Type: -
Hull Size: -	Default Size: -	Base Armor: -	Light: -	Heavy: -	Overkill: -

▼ Movement Data:

Mode: -	Combat: -	Top: -	Maneuver: -	Range: -	Re. Mass: -

▼ Perks & Flaws:

Name	Rating	Game Effect	Name	Rating	Game Effect
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▼ Offensive and Defensive Systems:

Qty	Name	Arc	DM	BR	ACC	ROF	Ammo	Special	MS	WC	AC
-											
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-											

▶ Section:

▼ Main Data:

TV: -	Off. TV: -	Def. TV: -	Misc. TV: -	Cost: -	Indv lemon dice: -
Crew: -	Actions: -	Sensors: -	Comm.: -	Fire Control: -	Type: -
Hull Size: -	Default Size: -	Base Armor: -	Light: -	Heavy: -	Overkill: -

▼ Movement Data:

Mode: -	Combat: -	Top: -	Maneuver: -	Range: -	Re. Mass: -

▼ Perks & Flaws:

Name	Rating	Game Effect	Name	Rating	Game Effect
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▼ Offensive and Defensive Systems:

Qty	Name	Arc	DM	BR	ACC	ROF	Ammo	Special	MS	WC	AC
-											
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▶ 5.1 SHIP AREAS

Most spaceships can be divided into five general sections. Engines and their associated engineering volume are typically an isolated section of the vessel and are handled separately from the rest of the hull. Weapons are another full section, even though some are mounted outside the hull and others inside. Cargo and carried craft resources take up large volumes in the main hull. It is, however, the remaining two sections that are of current interest: crew (habitats, duty stations, etc.) and operations (corridors, access tunnels, etc.).

Human beings evolved to live on Earth: traveling out into the void of space will always involve some element of risk. The ship's crew section is thus the largest problem in the design process of a new ship, and the one that receives the most attention. CEGA naval vessels provide a good, if cramped, standard of living. The section termed "operations" includes all manner of spaces and systems needed to guide the vessel, communicate, perform mission-related tasks and maintain all the systems onboard the ship. They play an important role in how well the ship will perform.

▼ 5.1.1 Crew Spaces

CEGA naval vessels rarely use spinning habitation sections. Maintaining complex gyros balanced against even more complex counter gyros is more trouble than the Navy needs to deal with. Since it tends to operate near planets and has a large reserve of manpower for crew rotation, CEGA doesn't mind having its ships under micro-gravity conditions. A few exceptions exist, such as the Constantinople-class troop transport and Poseidon-class battleship, but these serve special functions in the fleet.

Officers have a personal cabin that doubles as an office. Enlisted crew are assigned four to a cabin: in most cases, each crewmember has their own bed, generally a "zip bag" style sleeping hammock. With the two-watch schedule, there are usually only two people in the room at any one time.

The "zip bag" holds the crewmember in his sleeping space; this pouch-like sleeping bag is in turn fastened down by loose restraints that allow the individual to float gently during sleep. The restraints are strong enough to keep the occupant safe if the ship suddenly conducts high thrust maneuvers.

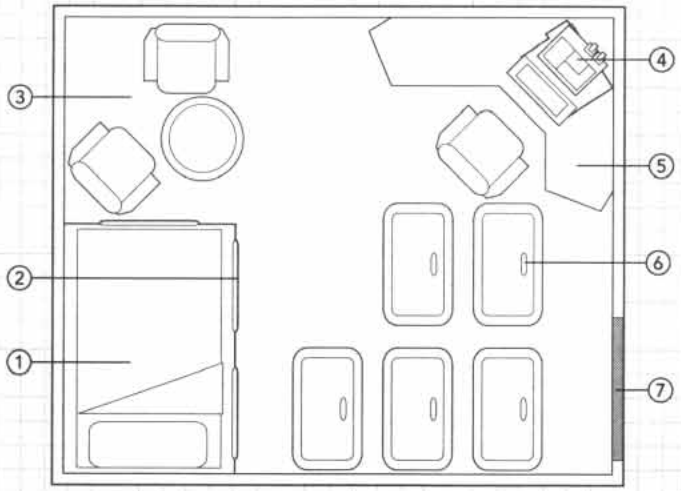
Keeping micro-gravity rooms clean is a difficult chore. Life support air filters do most of the job, and also double as catch basins for lost objects. "Vacbots" patrol the ship corridors on pre-programmed routes, automatically collecting free floating spills or can be manually programmed to clean a stubborn stain. For personal hygiene, everyone has a shower zip bag with attachments to allow water and soap to be injected within.

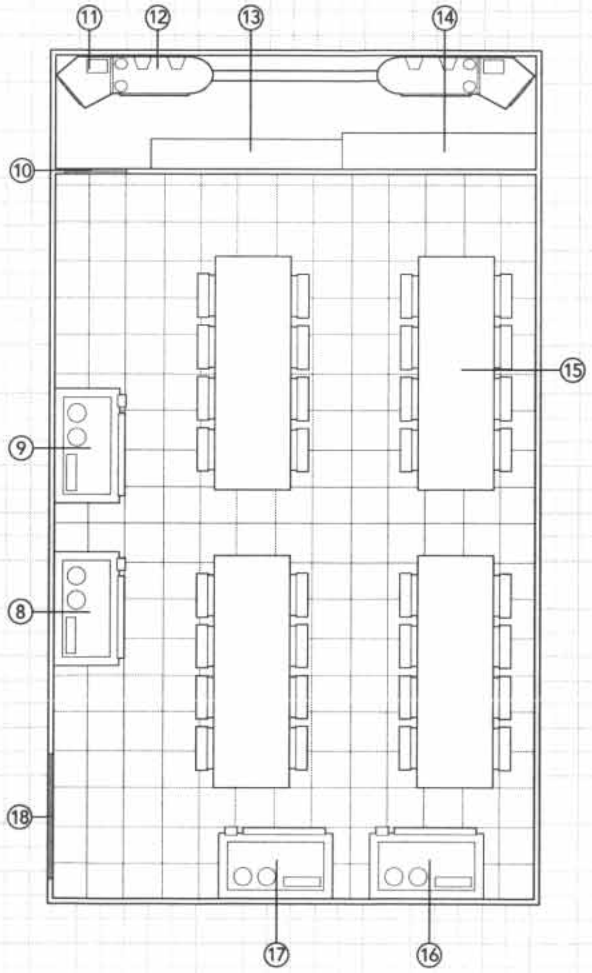
Galley sections vary in size depending upon the size of the ship's complement, but they all work along similar lines. Meals are served for thirty minutes before a shift change and for thirty minutes afterwards. Thus navy crew get the opportunity to have up to four square meals a day if they so choose. Most of the food is low-volume recycled algae-based material, spiced with condiments and nutritional supplements. Despite its origins, the food is usually better than what most people expect at first. Vending-style machines allow snackbars, foodpaste tubes or drinking globes to be taken onto a shift. Drink globes can be squeezed or sucked on to get the fluid out once the re-sealable tab is opened.

Due to the lack of natural orientation in the rooms, it is possible for people to approach from all different angles. Following established traffic patterns is thus important to prevent accidents and ensure a smoth flow. Painted chevrons show the proper direction for traffic; text within the chevrons describes what areas lie ahead. In general, it is customary to align oneself so the chevrons pointing in the desired direction are on the right hand side. Conveyors fitted with handholds run along the main traffic corridors. These automatically halt if maneuvers begin to produce sufficient gravity to allow crew to move about unaided.

HABITATION MODULE

Floor Plans





Legend

1	Bed w/Z-gee Restraints	13	Miscellaneous Storage
2	Storage Lockers	14	Service Counter
3	Configurable Rest Area	15	Table
4	Multi-purpose Terminal	16	Service Tray Storage B
5	Desk	17	Service Dispenser B
6	Floor Lockers	18	Main Access
7	Airtight Door		
8	Service Dispenser A		
9	Service Tray Storage A		
10	Kitchen Door		
11	Data Terminal		
12	Recycler		

▼ 5.1.2 Operational Spaces

Machinery and flight systems form an integral part of the vessel, and it is vital for peak operational efficiency that they be carefully maintained. They are located in what is generally termed the "Operations" section. These include the life support nodes, the avionics bays, and the various power distribution networks. Modern shipbuilding procedures often call for decentralized systems for maximum safety, and all have to be easily accessed for periodic check-ups and maintenance.

Access to the operational areas is not always through normal hallways: in many cases, narrow access corridors, often hidden behind wall panels, have to be used. Navigating these confined tunnels is a skill unto itself, and learning the twists and turns of each of the main zones is a necessary evil. If a ship is damaged in combat an alternate route may have to be found immediately just to be able to reach the item to repair. Those who have become experts at this task are often called "tunnel rats."

One of the main functions of the Operations spaces is to facilitate emergency repairs. The first and most immediate way to restore function to an inoperable system is to use the Damage Control booths located all around the ship. Hitting the activation button causes the protective panel to slide open, making the contents available.

Containers for first aid kits and emergency space suits are immediately identifiable by the large red cross and bright orange circle, respectively, that are painted on the upper surface of their containers. Fire-fighting foam sprayers are also within easy reach. The green grenade-like objects are "gloop balls," that quickly seal small breaches with a mixture of sticky non-toxic chemicals and a bundle of small plastic wires. Tool drawers contain both standard repair tools and some generic parts such as nuts and bolts. Specially marked drawers have tools and parts related to nearby ship systems.

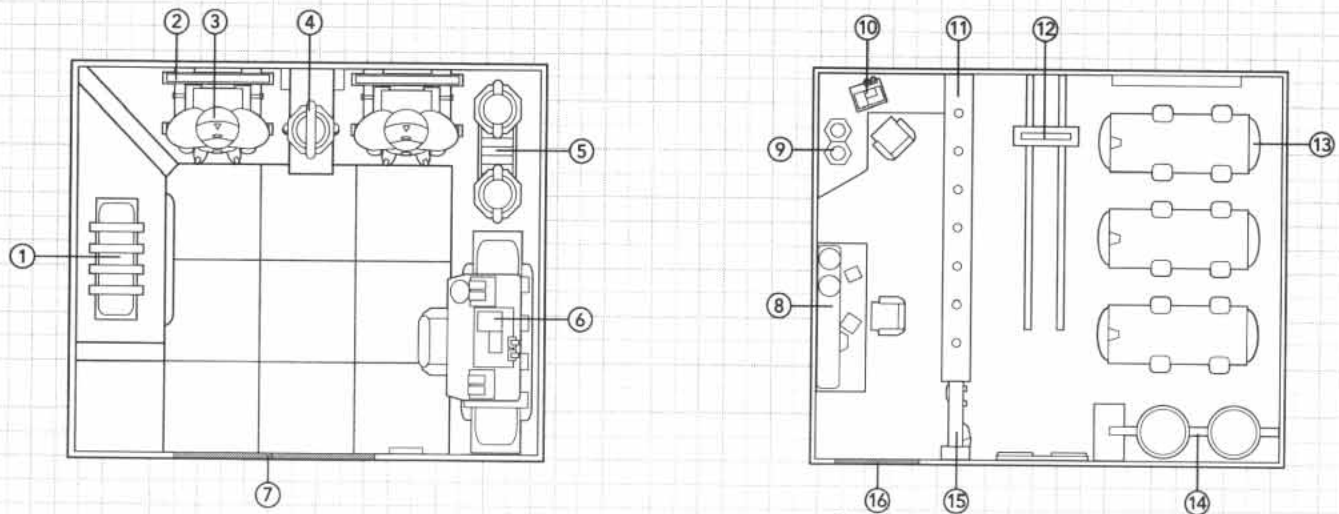
After addressing emergency concerns, the proper repair of the damaged equipment may be undertaken. Such work is performed by a mixture of specialists, bosuns, engineers and deck hands. Those involved and their number will depend on the nature of the equipment, the severity of the damage and how quickly the item must be repaired. Systems in the workbay allow both repairs and the fabrication of replacement parts. This is why each ship carries raw materials on board: small autofacs can be programmed to produce simple parts and systems, allowing the technicians to focus on more complicated operations.

Space-grade systems conform to high quality standards. In many cases, a small yet poorly-operating piece may disrupt a much large system. Testing centers provide a means to check that items are working according to design parameters. These chambers are heavily shielded to avoid contaminating experiments. Large metallic cylinders in the room have sensors placed in one end and test samples placed in the other. These create a highly controlled setting to examine if the sensor is functioning properly. The test equipment itself is kept in excellent condition to prevent unpredictable results.

The newer warships carry the means to deal with immediate emergencies, create workable solutions and then test the results to ensure proper operations. Having such resources also increases the useable lifetime of the design. Early vessels, such as Bricriu-class corvettes, had very limited repair facilities, and their operational range suffered as a result. The capabilities of the new carrier and assault vessels have given them an excellent track record both in supporting their onboard craft and in getting the maximum use out of their equipment fittings.

OPERATIONS

Floor Plans



Legend

1	Emergency Supply Closet	13	Test Chambers
2	Fast-release Suit Rack	14	Atmosphere & Gas Tanks
3	Engineering Pressure Suit	15	Test Area Access Door
4	Suit Oxygen Tank	16	Main Door
5	Rotating Tool Rack	17	Mini-oven
6	Coordination Desk	18	Bulkhead
7	Wide Double Doors	19	Test Chamber
8	Workbench	20	Computer Terminal
9	Memory Unit Rack	21	Hangar Airlock
10	Engineering Terminal	22	Main Autofac
11	Bulkhead	23	Access Door
12	Movable Support	24	Secondary Autofac

▶ 5.2 BASIC OPERATIONS

Although the CEGA navy is a relatively new player in the realm of space fleets, it has built on the traditions of the navies of her founding members. At first these often conflicted, but now they have been well blended, leading to the current naval operating practices. These ensure the fleet is ready to meet any situation which may appear from the depths of space: battles are brief moments of maximum effort preceded by lengthy periods of undistinguished preparation.

▼ 5.2.1 Watch Cycle

CEGA uses a twin-watch system to keep its vessels at the ready. Each watch is monitored by a watch officer, and the two officers work under the captain's directives. Under this system, crew alternate between approximately four to eight hours of active duty and four to eight hours off duty. The traditional term for the watches is "port" and "starboard" watch. Normally, the senior watch officer commands the starboard watch. The schedules overlap by fifteen minutes: the "Lombardi Rule" is implemented, promoting the early arrival of the crew to stations to ease the transition. The time is used to update the next shift of the recent events pertaining to the ship in general and the duty station in particular.

Watches

Time	Port Watch	Starboard Watch
0000	On duty	Off duty
0345	On duty	Called to ready
0400	Off duty	On duty
1145	Called to ready	On duty
1200	On duty	Off duty
1945	On duty	Called to ready
2000	Off duty	On duty
2345	Called to ready	On duty

▼ 5.2.2 Readiness Status

Six states of readiness, ranging from zero to five, are used on board CEGA warships. Panels on the intercom system display the current readiness status at all time, with vocal messages announcing changes. To simplify communications, naval personnel use the short form of R-0, R-1, up to R-5. State R-0 is only used when the ship is safely secured in a friendly port. Little more than the life support systems will be on: weapon systems have their firing systems removed and secured in a different area of the ship. Mothballed vessels or ships under construction are R-0.

R-1 is the lowest readiness state allowed when a ship is under way. Only a skeleton crew is officially required: maintenance is not performed by this crew, so only the minimum will be on board. A typical skeleton crew counts about a dozen crewmen to allow for shifts and some recreation time. Weapons are only locked down, so that the ship can be brought into action by a full crew in reasonable time. This state is used when the ship is docked in friendly port.

Normal military cruise conditions come under the R-2 classification. A ship at R-2 has its proper crew complement. One watch is always at its station, while the other is off-duty. Off-duty crewmembers are allowed to move about all non-restricted areas of the vessel. Crew use off-duty time to sleep, perform extra maintenance or to take some exercise. A vessel may continue on this pattern for months without abnormal effects.

If action is expected to occur but the time frame is uncertain, a vessel will go to R-3 status. This higher state of readiness can be maintained for a few days at most. The two watches will continue to rotate, but the off-duty watch must remain ready for rapid response. Spacesuits are worn continually, even while sleeping. Galley meals will still be served, but will be in a form that can be abandoned quickly. Ships systems and weapons will be kept on stand-by, thus preventing many routine maintenance tasks from being performed.

Captains call for R-4 as the ship approaches a battle situation. All hands report to their stations. Auxiliary craft, exo-armors and exo-suits are readied for launch and manned by their crews. Some may be launched to perform their specified function in the upcoming battle. Weapons systems are loaded, charged and cleared for immediate firing. Damage control parties form up and gather their equipment. Passengers without special authorization must go to a designated secure location, such as their cabins. As sections come to readiness, the internal atmosphere will be pumped away to prevent loss in the upcoming engagement.

The final state R-5 is reserved as a signal for times of deadly peril. In general, this means heavy combat. It can also signal that other dangers exist, however, such as the presence of a large meteorite cloud which could overload the point defense systems. In this state, everyone must expect the ship to come to harm. Sections of the ship may suddenly become uninhabitable. Ship weapons will be actively firing and violent maneuvers may be called to protect the vessel. Spacesuits are worn and the ship is in vacuum.

▼ 5.2.3 General Living Conditions

Shipboard life for CEGA navy personnel is very active. While listed as having twelve hours off duty time, none exceed an average of eight hours of sleep a day. Meals, exercises and social activities must all fit into the off-duty time. Conversely, shore postings are much more relaxed. This is because they operate on a three-watch rotation system. Each shore watch is eight hours, with personnel reporting fifteen minutes early (as onboard ship). This allows naval personnel to spend time with their families. In emergencies, even a shore post could convert to the two-watch system. This contingency allows all ports to provide immediate replacement personnel to the warships.

Few CEGA warships can simulate gravity. Those that can reserve the bulk of the gravity zones for exercise gyms, work areas, meeting rooms and recreation facilities. Medical areas are included, making the treatment of most injuries much simpler.

A small portion of the ship's complement will be quartered in the gravity areas. Most notably, this will include the officers, fleet operation staff and those who are expected to stay in space for extended periods of time. This allows them to stay on the ship over multiple cruises without ill effects. Personnel can be rotated at any port (and they must be rotated to avoid excess zero-gee exposure). Naval ports include training facilities to provide additional persons to be used to rotate warship staff.

Activities of the Constantinople-class and Poseidon-class have shown that the ability to retain the senior crew between voyages is extremely valuable. On these ships the captain, officers and hand-picked crewmembers stay in the gravity areas. Thus there is continuity when the bulk of the enlisted crew are rotated shoreside. The Admiralty is considering methods for including small gravity habitations in future warship designs. A number of methods for refitting existing major vessels, such as the Hachiman-class, with limited gravity wheels are currently being researched.

Onboard facilities vary greatly according to the size of the warship. Vessels the size of an ADB carry only the most basic facilities; on the other end of the scale, the Poseidon-class includes a VIP lounge in both of its habitation modules. CEGA ships typically possess general access lounges near the crew quarters and a reserved officers lounge near the bridge. The ship's galley does include video equipment for viewing transmissions, but the need to efficiently serve food prevents most recreation activities.

The typical lounge design complements the galley by being centered around entertainment. Lounges consist of several groups of comfortable chairs, each group turned in on itself to create semi-private zones. An entertainment console is generally the focus of the lounge chairs. These consoles can be set to operate as video relays to run movies, play multi-player games or study for exams. Audio is played through small ear pieces fed from different short-range comm channels to avoid flooding the lounge with too many different conversations.

▼ 5.2.4 Pilot Patrol Cycle

Tengu-class escort carriers are normally used for patrol purposes. These ships will almost always be those fitted to handle to four exo-armors rather than the limited force of two the Tengu was originally designed for. In many cases Tengus operate in pairs, increasing the patrol force to eight units. This provides better survivability in case of the loss of one carrier. Therefore, standard patrol forces consist of four or eight units. If a Birmingham-class carrier is pressed into service, it will therefore be able to reserve half of its units as a response force.

Two combat crafts typically make up a patrol. They are normally of two different types to provide greater flexibility in the operation. In cases where one particular system is highly desirable, say a large fuel supply or electronic warfare systems, then both units will be of the same model. The chart on the right contains the basic rotation pattern for a four exo patrol force. They appear as patrol teams "A" and "B." The exos and pilots have twelve hours on station, one hour in transit and eleven hours off duty, and they alternate. They are coordinated with the rotation of the ship's watch so that the same deck hands work on the same units.

Pilot fatigue will accumulate over the days, placing a limit on how long this pattern can be sustained. Patrolling carriers typically plan on sustaining the four-unit patrol for a maximum of six to eight days. Continuous patrols use the eight-unit patrol pattern.

Patrol teams "C" and "D" provide the duty cycles for an eight exos patrol force: they appear on the chart where they replace the "A" and "B" patrol teams. Hangar times for the eight unit scheduling is not listed. If two carriers are being deployed, patrols "A" and "B" operate from one vessel while "C" and "D" from the other. This insures that the port and starboard ship watches of both carriers are involved. Supporting continuous patrolling is much easier with each pilot and exo fulfilling six hours of on-duty time, thirty minutes of transit and seventeen and half hours off duty each day.

◫ Four (Eight) Unit Patrol Cycle

Time	On-Duty	Transit	Hanger	Ship Watch
0000	A	B (D)	-	Port
0015	A	-	B	Port
0345	A	B	-	Port
0400	B	A	-	Starboard
0415	B	-	A	Starboard
1145	B	A (C)	-	Starboard
1200	A (C)	B	-	Port
1215	A (C)	-	B	Port
1945	A (C)	B (D)	-	Port
2000	B (D)	A (C)	-	Starboard
2015	B (D)	-	A (C)	Starboard
2345	B (D)	A	-	Starboard

▼ 5.2.5 Culture and Traditions

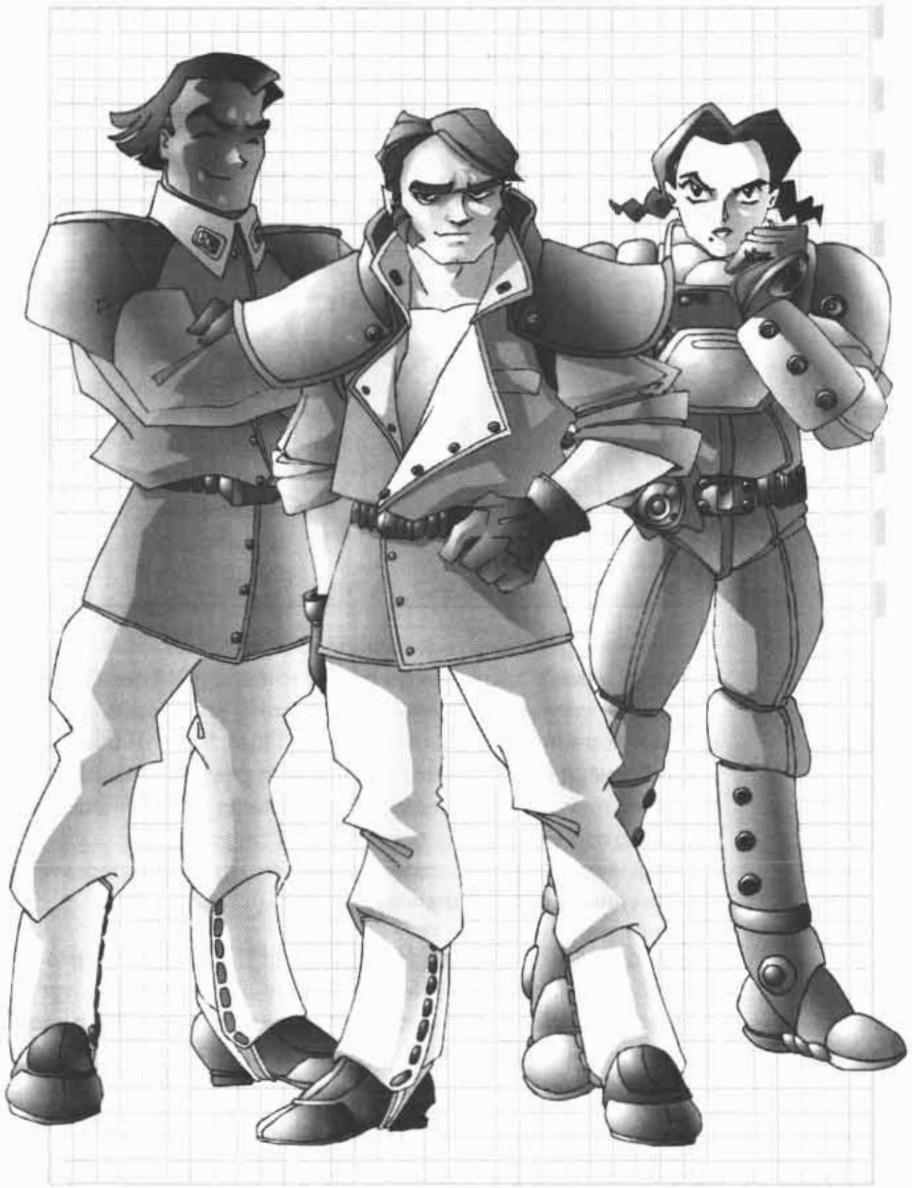
The Central Earth Government Administration came from a merging of the majority of Earth's powerful nations, and the same was true for the early CEGA navy. Each culture brought their own traditions with them, both from a naval and space origins. Over the last few decades, they have been merged together and new ones created as the CEGA Navy comes into its own.

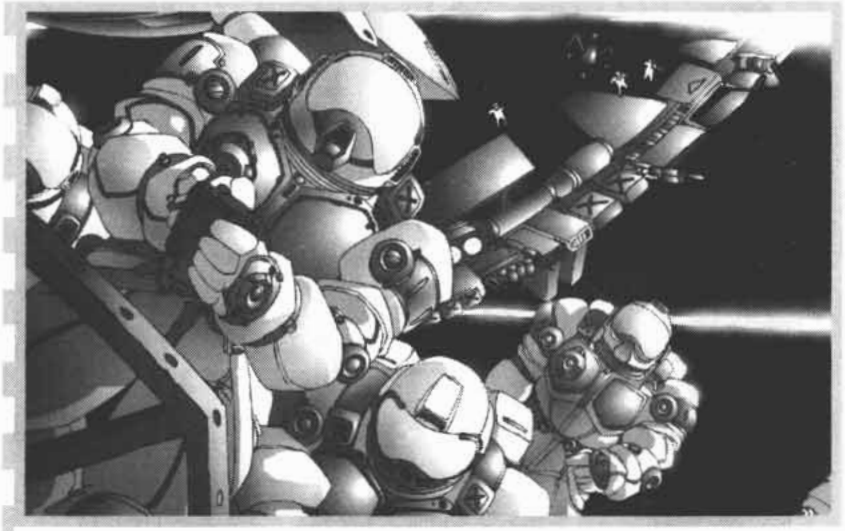
Perhaps the most obvious tradition is the bosun's pipe. Every bosun (or engineer, on ships without a bosun) carries one. When an officer comes aboard, the Bosun will use his pipe to signal his arrival. Since sound doesn't carry in a vacuum, this is delayed until the officer(s) are entering a pressurized portion of the vessel. Each officer rank has its own call tone. Ensign is the shortest, and the longer signals indicate progressively higher ranks. If more than one officer is present, the bosun has the option of piping only the highest officer rank.

Months of space travel become routine quickly, and boredom can easily set in. To add a burst of excitement to what would otherwise become unbearably tedious, a number of traditions have evolved to allow the crew a change of pace, if only for a few hours. Each ship tends to evolve its own traditions, some of them utterly bizarre.

In late 2188, the captain of the *Okane*, a Bricriu-class corvette, officially approved "Bahama Days" on board his ship. On every fifteenth day when the ship was underway, the captain authorized a "Bahama Day:"on that particular day, the crew were allowed (and sometimes expected) to wear colorful oversized clothing over their normal uniforms. The life support systems in the lounges was adjusted to simulate tropical (or at least pleasantly warm) conditions. The cook offered fruit drinks and non-alcoolic cocktails in globes that had straws shaped like folding umbrellas. There were limitations to the festivities, mostly as safeguards against accidental equipment damage, and crew on duty were obviously not part of the party. As a rule, all festive gear had been designed so that it could quickly be cleared away if the ship suddenly went to an "R-3" or higher readiness state. To this day, the *Okane*'s strange tradition continues.

Other traditions have less to do with crew morale and more with boasting its successes. Warships which have swept away hostile forces from an area will return to port with a broom tied to one of the communication masts (the EVA task being generally assigned to the youngest and most inexperimented member of the crew). This is an old tradition going back to the time of wooden ships armed with gunpowder cannons. Ships also maintain a metal plaque engraved with the names of the operations they have participated in, including the names of any enemy units destroyed. After an engagement, the ship's workshops update the information. The ship's plaque is generally mounted securely to the wall in the hallway just outside the bridge.





▶ 5.3 CARGO AND FUEL

Remote operations require numerous resources. This is why all major vessels have a cargo bay of some sort. Materials carried include combat craft, maintenance craft, spare parts, supplies, crew recreational gear, munitions and fuel. Many of these come under what is referred to as deployment gear. This includes lubricants, hydraulic fluid, replacement batteries, paint, filters, lights, wiring and so much more. Even empty cargo bays are useful. The engineers are quick to convert them into large open spaces where the crew can stretch their legs.

Following is additional descriptions of the common items and resources handled on a daily basis by quartermaters and weapon loaders. Tables provide detailed numbers for those wishing to do their mission planning in greater details.

▼ 5.3.1 Carried Craft Storage

The ship's support craft are stored in the main bay. These range from small utility vehicles to powerful exo-armors. Information in the table describes the volume of space needed for this storage. Due to the arrangements of some spaces, it may not be possible to add a vehicle to a bay. Thus quartermasters have to learn to get all the ship's cargo to fit in the one bay properly.

In the case of carriers additional docking areas hold much more. These support exo armors for larger operations. Those lacking separate docking areas typically store them in the more limited fashion (-1 to Tech Skill rolls, four reloads for the vehicle on hand). Carriers normally operate in a standard arrangement that supports proper maintenance (no Tech Skill roll modifier and sixteen full reloads). Extensive stores provide much more in the way of tools and storage racks (+1 to technical rolls and sixty-four reloads). Crate storage is simply that; the vehicle is stored tightly in safe confines and will take hours to prepare for operation.

Carried Craft Storage (in cubic meters)

Vehicle	Size	Crate	Limited	Standard	Extensive
Wyvern	13	422	2109	4218	8438
Syreen	12	343	1715	3430	6860
Cerberus	14	512	2560	5120	10240
Wraith	12	343	1715	3430	6860
Fury	13	422	2109	4218	8438
Atlas OTV	12	343	1715	3430	6860
Shuttle	12	343	1715	3430	6860
Work Bee	3	16	78	156	312
Piranha Pod	4	27	54	108	216

▼ 5.3.2 Fuel Storage

In accordance with Newton's laws, spaceships must apply force in one direction in order to propel themselves in the opposite one. This is done by accelerating superheated mass, which is then ejected in a controlled manner. In turn, the vessel is pushed or rotated, depending on how the thrusters are directed.

This requires the use of reaction mass, which can be of a variety of materials. Liquid hydrogen is the most efficient: it can be stored in a "slush" state by durable refrigeration equipment. Hydrogen is light and easy to accelerate in the ship's drive. To find a ship's volume of liquid hydrogen, the ship's weight in tons is multipled by the number of Burn Points available and then by 0.00001.

Vehicles use the maximum tonnage for their Size category. Capital ships show the total mass for all their sections. Ships with multiple drives show the sum of all fuel kept in the drive units. Conversions of storage space or the weight of cargo is not reflected in this information.

◫ Liquid Hydrogen Fuel Statistics

Vehicle (name)	Veh. Mass (tons)	Fuel (BP/tons)	Fuel Mass (tons)	Fuel Volume (m^3)
Hydra	1×10^4	9.7×10^4	9.7×10^2	1.4×10^4
Forge	3×10^4	9.7×10^4	9.7×10^2	1.4×10^4
Birmingham	2.5×10^5	1.5×10^4	1.5×10^3	2.2×10^4
Wyvern	65	2.9×10^4	0.29	4.2
Syreen	52	1.8×10^4	0.18	2.6
Cerberus	81	2.8×10^4	0.28	4.1
Wraith	52	1.3×10^4	0.13	1.9
Fury	65	2.3×10^4	0.23	3.3
Shuttle	52	5.2×10^4	0.52	7.4
Atlas OTV	52	1×10^4	0.1	1.4
Cutter	16	5.2×10^4	0.52	7.4

▼ 5.3.3 Deployment Gear

Deployment materials are what allow the vehicle's myriad of parts continue to work right. In some cases, parts must be replaced. In others, such as filters, they can restored by regular maintenance. Losses always occur in operations, so deployment materials are needed to keep a vehicle going.

The following table shows what is needed to fully restore a vessel's natural Deployment Range. To determine this for other vehicles, calculate the volume of deployment materials in cubic meters as (0.00067 x Size Squared x Deployment Range). Deployment materials weigh 0.2 tons per cubic meter. Capital ships may have sections (e.g. KKC turret) with less than the standard 3,000 hours of operations and the table corrects for this by providing materials needed to extend the section to 3,000 hours.

◫ Deployment Statistics

Vehicle	Time (hrs)	Volume (m^3)	Mass (tons)
Hydra ADB	3000	968	194
Constantinople	2000	2130	426
Birmingham	2000	1630	326
Wyvern	500	56.6	11.3
Syreen	300	28.9	5.8
Cerberus	300	39.4	7.9
Wraith	200	19.3	3.9
Fury	500	56.6	11.3
Atlas OTV	300	28.8	5.7
Shuttle	1500	144	28.8
Landing Cutter	2000	341	68.2

▶ 5.4 MAINTENANCE

When thin outer walls are all that separate one's from a deadly void, the value of good maintenance practices is self-evident. Much of the crew's time is spent performing mundane tasks to ensure the equipment remains in good order and is ready for action. Civilians may skip on regular maintenance, but doing so on a combat vessel is an invitation to be destroyed.

Combat incidents inflicts thousands of minor strains on the ship, which may have significant effects later on. Units engaged in repeated heavy combat will need to double the man-hours per week listed below for maintenance. The normal factors are Size of vessel x 5 (if a spaceship), x 2 (if equipped with a Walker movement system), and x 2 (if a Limited Production item).

Additional craft maintenance for weapon systems averages around one third that of the main hull time for most units. Heavily armed craft may need more than this, while unarmed vessels require no extra man-hours. Capital ship weapon maintenance is taken care of by the ship's gunnery crew.

Craft Maintenance (man-hours/week)

Vehicle	Size	Hull	Weapons
Wyvern	13	130	40
Syreen	12	60	20
Cerberus	14	140	45
Wraith	12	60	25
Fury	13	65	varies
Atlas OTV	12	60	0
Shuttle	12	60	0
Landing Cutter	16	160	15

Ship Main Hull Maintenance (man-hours/week)

Section	Size	Hull	Weapons
Hydra ADB	22	220	60
Constantinople	40	400	200
Birmingham	72	720	150

▶ 5.5 EMERGENCIES

Space is radically different from the environment that Man evolved in. As a military organization, the CEGA Navy places itself in harm's way for the protection of Earth. Invariably, its vessels will become damaged and at time, destroyed. Naval personnel are trained to survive these situations to reduce losses.

Reviews of parts of this training are provided here. Actual situations are often used to demonstrate particular techniques. It is a deadly serious matter, and the courses reflect it. Indeed, the majority of crew deaths come not from the direct effects of enemy weapon fire, but from the subsequent exposures to vacuum, cold, heat or radiation. Space is a very, very unforgiving place.

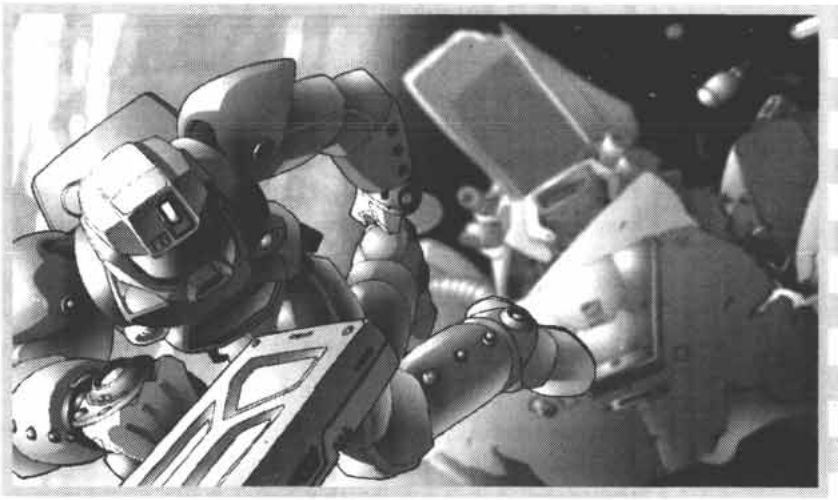
▼ 5.5.1 Basic Space Survival

The CEGA Navy Safety Center prepares and requires various courses to be taken by Navy personnel. The first introductory course shows basic techniques that are rehearsed and practiced extensively (this course is the equivalent of Space Survival 1).

Knowing a few basic techniques will greatly enhance one's chances of survival. The first line of defense is the spacesuit. In combat, the outer hull can be breached at any time, and the ship runs under vacuum as a precaution against explosive decompression. Anyone caught without a spacesuit should immediately secure one of the emergency space suits found all over the ship.

Suit Integrity and maintenance — fabric wear, seal integrity, air supply, batteries and patch kit — can be checked within a thirty minute period.

Most suits can be set to report oxygen levels through audio messages. If this feature is deactivated, levels must be checked manually. A loud buzzer activates when suit is low on air. There have been instances of unconscious people being waken by this buzzer, which allowed them to get to safety.



A number of emergency suits models can be found in the CEGA Navy based on when vessels last had their stocks rotated. All crew are required to practice donning several different types in case of emergency.

Shipboard traffic guides allow safe movement around corridors, especially during emergencies. Handholds and footholds follow these patterns for faster movement.

While it is easy to operate an airlock under normal conditions, the panic many feel when air is running out has caused more than one person to fail to properly cycle the airlock. For this reason, all personnel are drilled and tested to operate an airlock almost without conscious thought.

Radio-2 is the emergency band. Location information is transmitted on a sub-vocal channel, and suits will only relay radio messages from units in close proximity to cut chatter and save power. Messages will often be directions to a safe haven or a distress message from someone in need of assistance.

▼ 5.5.2 Survival Scenarios

A better appreciation of survival techniques comes from reviewing successful and unsuccessful real life situations. While some of these may be one-in-a-lifetime occurences, most contain an important lesson for the careful observer. The following situations have been picked randomly, but show the dangers that crews may have to face in the course of their duties.

Fire: during a battle, engineers were keeping their ship's engines operating after having been struck several times by enemy fire. All crew present wore duty spacesuits, according to standard combat procedures.

Unknown to the crew, one of the rounds had been deflected into the local life support system, and oxygen was rushing back into the control area when the ship's pilot made a wild evasive maneuver. A gush of plasma leaked out on the outer hull of the ship before losing all its energy to space. Due to the shielding, the splash did not directly affect the engineering section. The wall was flash-heated, however, and as the oxygen blasted into the room, the combination of heat and oxygen ignited many items, including the surface of some of the engineers' spacesuits.

The crew quickly sealed themselves into the nearest escape pod but instructed the computer not to provide atmosphere. Only a small amount of oxygen had billowed into the pod, and without more the fire soon extinguished. As a precaution, the men placed emergency patches from the escape pod's reserves over the scorched areas of their suits and contacted the bridge from the pod. When a damage control team stopped the fire, all engineers returned to their post.

Navigation: a Wyvern exo-armor had become separated from its flight after a skirmish. Its reaction mass reserve had been exhausted by a combination of erratic maneuvers and battle damage, a particle blast had disabled the unit's communication system, and the fried navigation program module was unsalvageable.

Using the telescopic function of the main sensor package, the pilot scanned the sky for blue and red-colored stars. With the image enlarged by the onboard flight computer, he was able to identify which blue star was Earth and which red one was Mars. Using the Sun as a third reference point and his targeting system for help, he quickly extrapolated his position and velocity.

Aiming his communication system at Earth, he sent out a distress call containing that information. In combat, electronic warfare greatly reduces the range of radio transmissions; however, he was now well clear of any such interference. CEGA Search & Rescue extrapolated his current location from the data, and even determined which ship he was from and where he had launched. From these data points, they determined his drift vector and dispatched a corvette to pick him up.

Repairs: after doing a series of weapon tests, a particle cannon was found to need an overhaul: its power output was well below specifications, and no obvious cause could be found. Unknown to the repair team, a wrench had been left behind by the previous team and touched a corroded link, causing a short-circuit.

When one of the techs saw the wrench, he picked it up without thinking. The wrench was still touching the capacitors and the electricity discharged into the outer hull, using the man as a conductor. He could have been killed, but his tether cable acted as ground: instead of going through his body, the electricity went along the outside of the spacesuit, then down the cable, which was welded to the hull by the discharge!

▼ 5.5.3 Escape Techniques

Due to the compartmentalized nature of spaceships, it may be possible to abandon only part of the vehicle. When damage to a ship becomes excessive, however, the crew will often have no other option but to try to escape the doomed vessel. Over the years, a number of techniques were developed for this.

If all other evacuation option have been exhausted, the crew may "jump" to leave the ship. This term refers to exiting the vehicle clad only in a spacesuit and with whatever one can carry. If possible, extra maneuver rods and life support supplies should be grabbed on the way, though it's not always possible. This is a most hazardous situation, due to the limited resources available to the crew; it is also one of the most commons, however. Because of this, identification and tracking procedures have been implemented and must be followed to the letter. Distress beacons must be on at all time, and any calls over the emergency channels kept short so that others can also get through.

Debris in the area can kill ajumper, or at least damage his spacesuit. When jumping, one has to be sure to rapidly get away from the ship's hulk. In battle, the ship may be the target of additional attacks which will throw yet more debris.

Escape pods are a better choice, if available. Two-person escape pods can be found along the outer hull of all ships. A third person could possibly fit, but at a great reduction in endurance. Pods significantly improve the survival chances of stranded crew. Escapees can take turns monitoring for rescue ships and keep each other company. It is important to fill all pods to their maximum capacity before launching to avoid shortages.

Larger escape craft can also be found near heavily crewed areas. The most common escape unit in the CEGA Navy is the sixteen-man Dunkirk III escape boat. Any vessel with fifty crew or more has at least two of these craft. Their extended reserves can push their occupation level up to twenty-four persons if need be.

Lifeboats play an important role in surviving the destruction of a ship. Their large communication suites increase the odds of contacting a rescue ship, and their larger size (compared to a suit) is also easier to detect. Lifeboats effectively implement "anti-stealth" technology to make them easier to spot. Small maneuver thrusters allow them to avoid collisions or even dock with other craft.

When the escape scene is deemed safe, lifeboats will be called upon to gather up escape pods. The Dunkirk III includes two inflatable docking ports/airlocks, along with several lengths of tether cords to allow additional escape pods to be towed along. Standard procedures call for badly wounded personnel to be transferred into the boat for medical attention, while those in better condition move into the vacated escape pods. A small store of supplies allows the Dunkirk III to resupply escape pods.

▼ 5.5.4 Rescue Operations

Once the crew has escaped immediate harm, it will need to prepare itself for recovery. The method of recovery will depends significantly on the method of escape. In some cases, several rescue operations may be needed before all the stranded personnel can safely get back onboard a ship or station.

Jumpers are in the most urgent need for rescue, due to the limited reserves of their suits. If a rescue ship is not immediately available, they should attempt to get to a nearby lifeboat: with their airlock, they can bring jumpers inside.

Escape pods only have sufficient propulsion resources to escape the ship, stabilize their vector and stop any rotation. An automated transponder will then attempt to contact a rescue vehicle. The communication system automatically provides them with the pod's flight profile information. The pod has to rely on the recovery craft to conduct the docking operation. If hard pressed, it is always possible to jump from an escape pod, however.

Lifeboats both need rescue and are able to perform rescue themselves. Having good (if limited) thrusters, lifeboats can perform their own docking maneuvers. Before ejection, the lifeboat downloads, if possible, the ship's current position and velocity from the navigation computers. This information is important to relay to rescue ships, who can then conduct searches of the wreckage for more survivors faster and more easily.

▶ 5.6 COMBAT OPERATIONS

The vessels of the CEGA Navy are warships before anything else. All other onboard ship systems, such as the cargo bays, exist to support this duty. There are powerful advantages to specializing a vessel: in combat, even a small advantage will often determine who is the victor and who is destroyed. While each class of ship is specialized, they all fit into the overall fleet as a defensive, transport or offensive spacecraft.

Defensive designs exist to both protect the other fleet resources and to allow them a higher degree of specialization. They Hydra-class area defense boat, with its anti-exo and anti-missile weapons, is a typical defensive vessel. Bricriu-class corvettes are also defensive in nature: corvettes function as skirmishers to break enemy attacks and conduct patrols to defend areas of space on the edge of the fleet's zone of operation. Tengu-class escort carriers are also classified as defensive vessels, providing exo-armor and fighter teams for patrols and covers.

Birmingham and Hachiman-class vessels show the distinctive nature of vessels operating in offensive roles. Both are committed to providing the maximum offensive punch that their hulls can hold, but use different means to pursue that objective. In the case of the carrier, it is a specialized exo-armor squadron that is launched when the objective comes into range. The Hachiman destroyers are so heavily armed, on the other hand, that they have forced other fleets to begin replacing their destroyer forces just to keep up in the arms races.

Transport vessels carry important mission-related materials. The marine force of the Constantinople-class is one example: they are brought to the area of operations with a very specific function in mind. The Poseidon-class battleship is included in this category: while carrying heavy armaments, its main function is to carry the fleet command resources. Other types of ships transport the logistical supplies needed for extended fleet operations.

▼ 5.6.1 CEGA Fleet Definitions

With each ship design being specialized, the CEGA warships typically operate in complementary groups to perform missions. Several defensive vessels will be assigned to protect the core, which consists of both offensive and transport designs. Tactical plans distribute these three resources into various roles, which include skirmishers, ships of the line, assault forces and convoy vessels.

◇ Skirmishers

These units are placed forward of the units they are screening. Their duty is to limit the enemy's access to the main fleet resources. Opportunities will also arise for the skirmishers to attack, and possibly destroy, important enemy targets. Due to this threat, the enemy will often have to disperse his resources to respond.

The bulk of the skirmishers normally forms ahead of the battle line. Units will also be placed around the ships of the line, the assault forces and to guard the convoy vessels. Another popular location is on the forward diagonals, where the skirmishers may be able to penetrate into the rear of the opposing line.

Bricriu-class corvettes are the primary CEGA skirmisher unit. Capable of engaging both capital ships and exo-armors, their presence on the field cannot be ignored. Hydra-class area defense boats are another common skirmisher unit, though they are also used as escorts for the main fleet resources. Exo-armors excel at skirmisher duties: fast, agile and with a relatively high striking power, they pose serious obstacles to the enemy's line of battle.

◇ Ships of the Line

These are the workhorses of the fleet by their inherent firepower. Formed up in groups with the bow towards the enemy, their powerful weapons devastates whatever comes in their way. Skirmisher units sometimes appear in the area, but their function is merely to defend against enemy skirmishers. Hachiman-class vessels form

the bulk of CEGA's ship of the line assets. As this is the best defended forward position, the Poseidon-class battleships also operate in this zone. Likewise, Uller-class missile cruisers will fire their barrage from there, before retiring to the rear area to rearm.

Keeping the line in formation is a difficult business. In most cases, the ships forego any maneuvering and simply coast towards the target, pounding it as they go. This is not as dangerous as it may sound: while coasting, the ships provide superb firing platforms for their weapon batteries. Any loss inflicted on the enemy at long range is one less to face when the two lines finally meet.

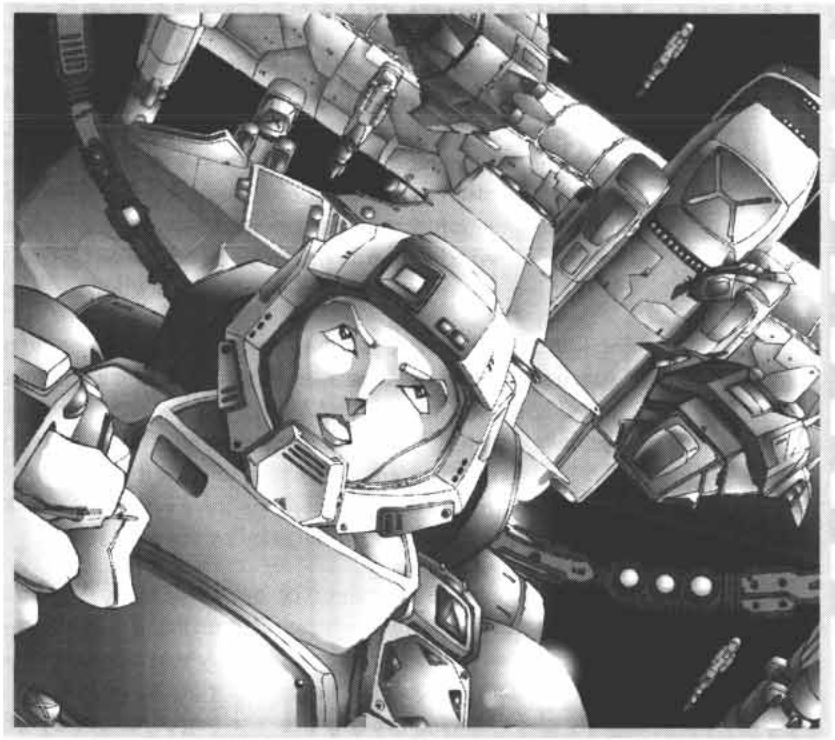
◇ Assault Forces

Units placed in this tactical position are intended to conduct a very localized attack on a specific target. Operating under the cover of skirmishers and the main battle line, these ships must move close enough to launch the assault. This distance varies according to the type of assault being done.

Constantinople-class ships are the best example of a ship designed for the assault role. They extend the influence of the CEGA Navy directly into the enemy's base of operations by sending in hard to block infantry and exo-suits.

Birmingham-class assault carriers can also operate as assault ships. In their case, they launch their exo-armors at a strategic time in the battle to conduct a raid, using their catapult to provide them with a starting velocity at no reaction mass cost. The range of exo-armors means that the assault can actually be launched well before the two battle lines enter the engagement. This is an excellent way to eliminate key enemy resources in advance and leave the friendly battle line in a superior position.

Uller-class missile carriers sometimes function in the assault role by moving forward to barrage their selected target with missiles, though this is a risky tactic. Ullers lack the endurance and staying power required to survive an extended engagement.



◇ Convoy Vessels

Ships placed in the convoy areas are doing their part by transporting crucial reserves for the rest of the fleet. Convoy ships are most commonly cargo vessels, but assault units often travel amid the convoy if their target is not in close range. This places them well behind the battle line, where they are preserved for when their target can actually be reached.

Tengu-class escort carriers are normally found in the convoy as well. Possessing limited firepower, they cannot contribute directly to the battle line. Their reason for existence is the deployment of exo-armors and interceptors, which will fly forward as skirmishers.

▼ 5.6.2 Battle Plans

Decades of space operations have shown that a highly coordinated force will always perform much better. This section shows how the tactical duties are organized during actual engagements. These are just a sample of the battle plans available: fleet commanders will often derive additional formations when faced with a real life situation that doesn't quite fit any existing plan. If it proves successful, the battle plan may be added to CEGA's tactical doctrine, greatly adding to the reputation of its designer.

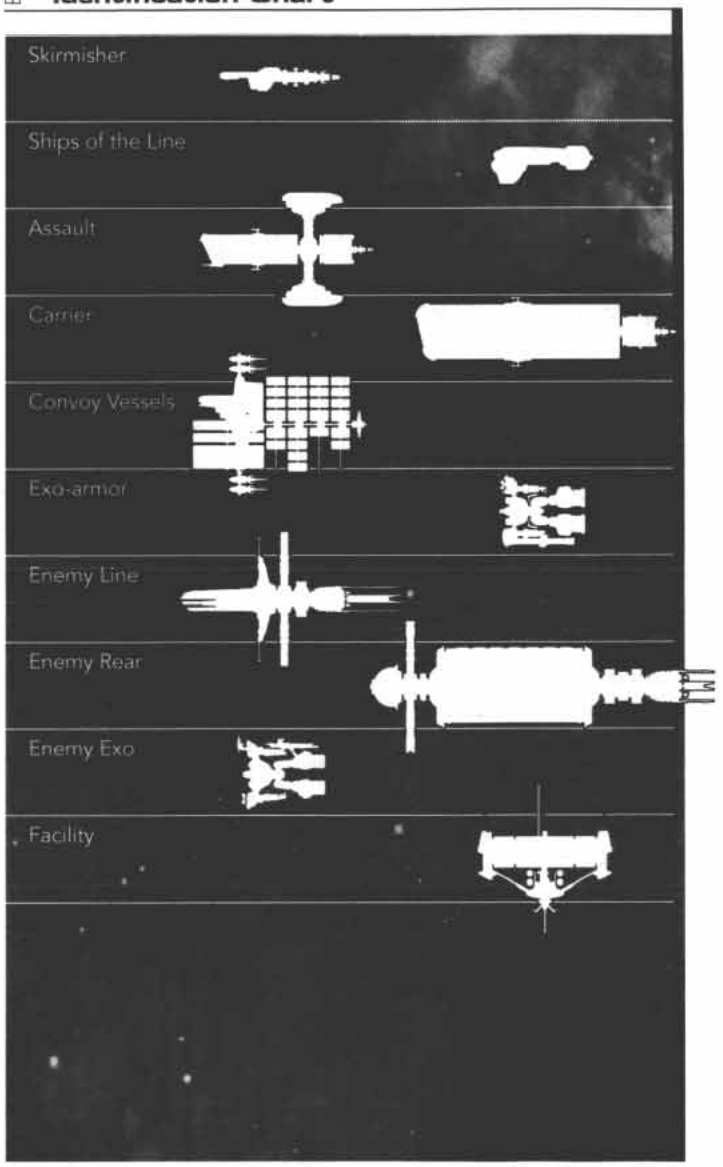
Engaging the enemy fleet is the primary focus of the battle plans. If space superiority can be achieved then followed on, operations can be repeated until successful. On the other hand, if the enemy fleet still operates in an area, resources must be allocated carefully. Some commanders are willing to stick it out in a difficult situation, leading to battles where the force besieging or stalking an objective is in turn under siege by an enemy fleet.

Fixed resources are a common objective for tactical maneuvers. Although a space station facility is pictured in the following pages, it could just as well be a merchant convoy that does not have the option of changing course; in space, all motions are relative. Most facility plans focus on taking over the target for use by CEGA's own fleet, and thus to avoid damaging it if possible.

The following battle plans cover both extended engagements and lightning strikes. As with the battle plans in **Ships of the Jovian Confederation Volume 1**, the use of the wave strike rules are required to properly run battles using formations during a lightning strike. These rules can be found on page 122.

The icons in the chart at right will be used in the various diagrams to represent a tactical role, not necessarily the ships themselves. None of the icons or distances are properly scaled; only the various force movements and the placement of both friendly and enemy units are represented.

Identification Chart



◇ Squadron Deployment

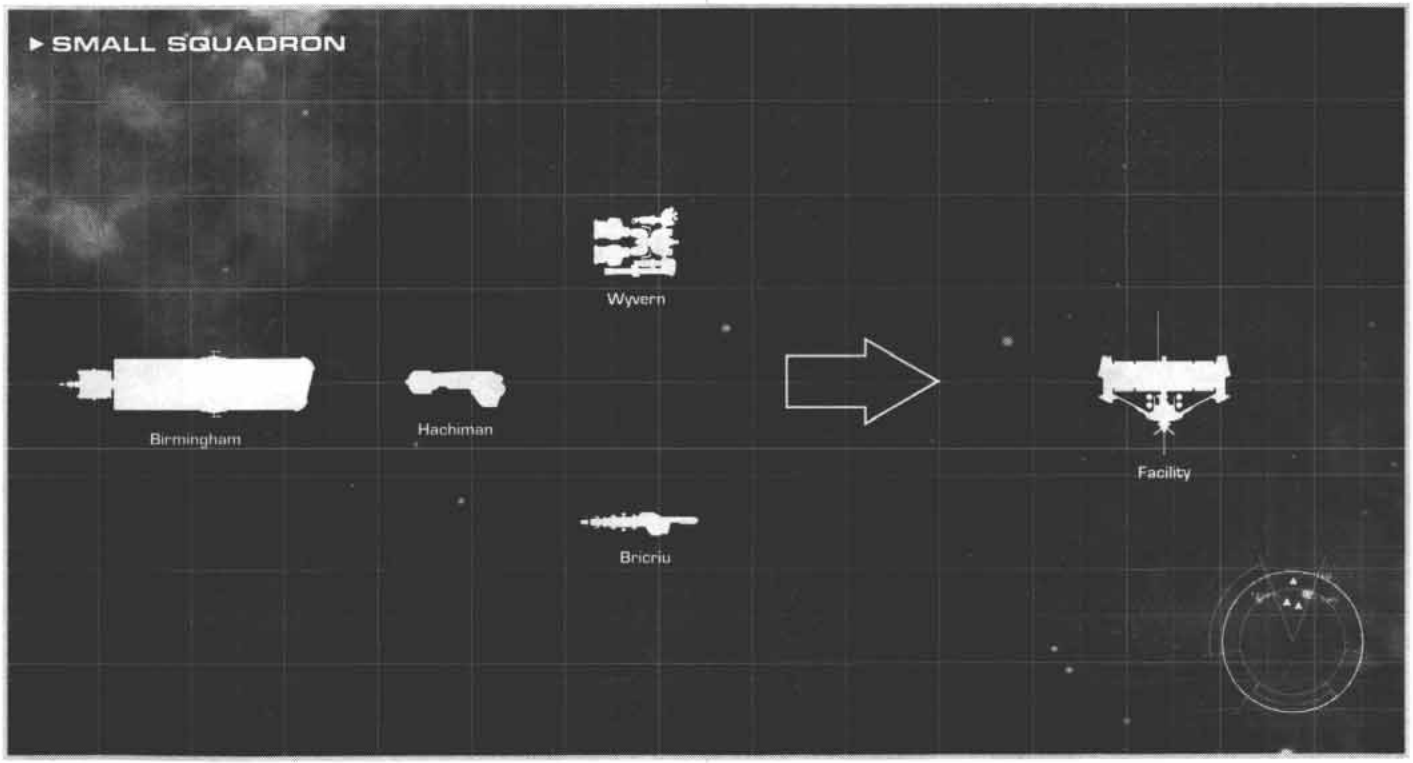
Admirals frequently have to oversee the fulfillment of several objectives. By forming groups of ships in squadrons they may achieve secondary objectives. This allows the main fleet to focus on one primary goal.

Such squadrons invariably contain at least one Hachiman which provides their heavy punch. For missions where the target is an exo squadron or carrier Tengu-class carriers will be attached. Four corvettes is a common number to see in a squadron. However, one or two will almost always be away running an errand, transferring crew or escorting a supply ship for the squadron. Area Defense Boats only appear on an as needed basis.

The Hachiman vessels form the battle line. In an engagement the ships required to fulfill the objective form in the rear. They will only come forward when the time is right to engage their target. Skirmishing units, including possible exo armors, will seek to engage the enemy line in close quarters. Their goal is to draw the fire away from the heavier ships.

Squadrons are particularly useful against targets with little firepower. The mix of vessels allows CEGA to conduct the operation without using an entire fleet. Peace time operations normally use only the smallest five or six ship squadrons. With the continuing escalation toward war large squadrons, some as many as fourteen ships have been seen.

When a squadron is dispatched either a flag officer, rank Commodore of higher, is placed in command. The command staff will load themselves onto a Hachiman. From here they will direct the entire squadron. Fleets may need to dispatch squadrons for unexpected duties, such as pursuing a portion of an enemy force. In these cases one Captain is made Acting Commodore for the duration of the assignment. Success or failure in the operation will determine if the individual will ever see promotion to full Commodore anytime in their career.



◇ Marine Squadron

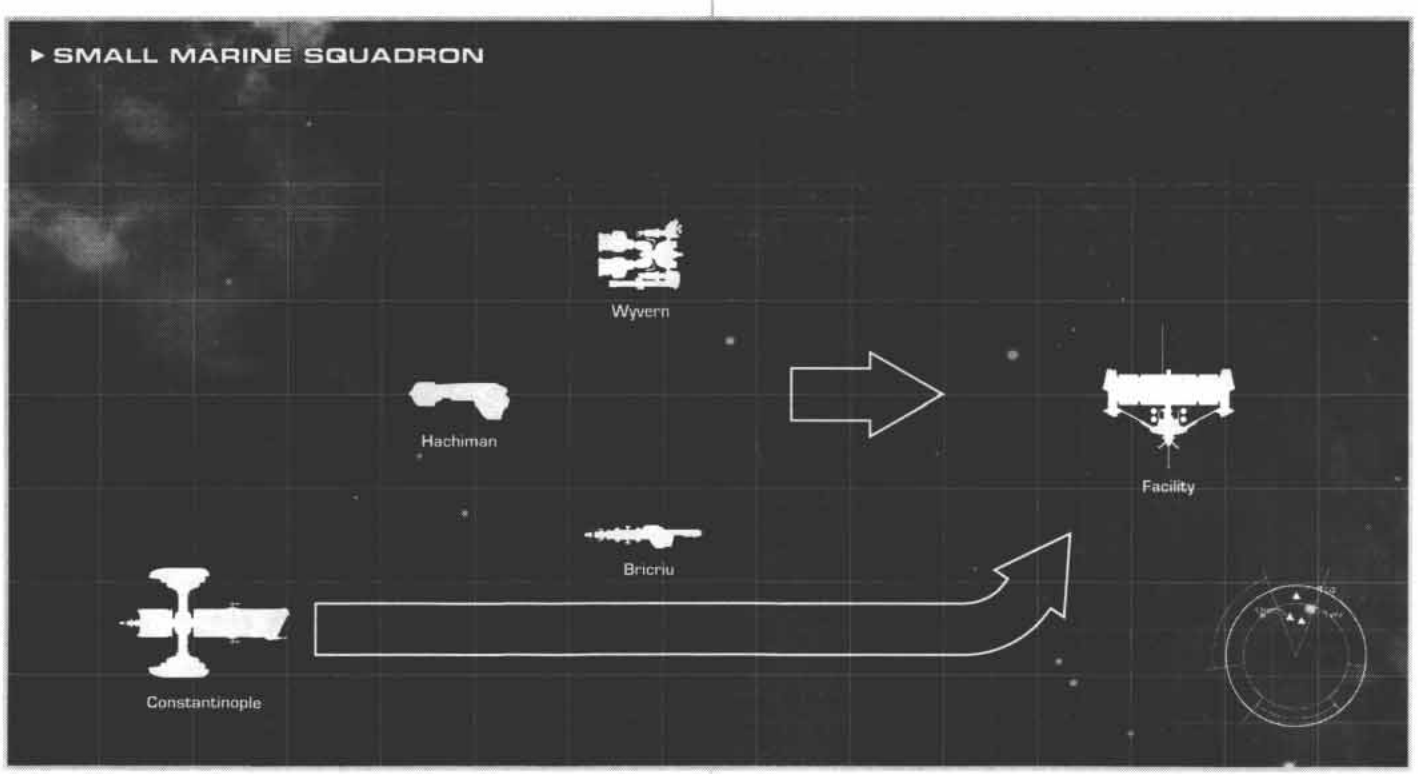
Marine squadrons have the specific task of invading a target, most often a colony or installation. The reasons for this are numerous; one of these is to move ahead into the area of operations and seize a suitable port for the rest of the fleet to use as a base of operations, "leapfrogging" from one to another.

Admirals are careful in how they use their marine assets. Once a target has been invaded, it mean the marine force has to stay deployed or local control will be lost. Without its marine contingent, the Constantinople-class ship has little to contribute to the fleet actions. After unloading the troops it had been ferrying, it will have to be sent back to a friendly base to resupply. Furthermore, the vessel is too valuable to send back alone. Combat craft escorts and at least one Hachiman destroyer will have to be detached to protect it. Thus the deployment of a marine squadron generally means the entire squadron is out of the operation.

In this kind of operation, the line and skirmish units will engage the enemy forces first. Their duty is to disable or destroy any heavy defensive installation present in order to open the way to the transport ships. In general, the smaller defense guns are left to the exo-armors and fighters of the task force so as to not run the risk of damaging the facility beyond use.

Additional exo armors and interceptors may be involved. If needed, Tengu-class escort carriers will be used. If the target is so heavily defended as to require a Birmingham-class vessel, then a full fleet action is more likely.

Once the preliminary bombardment is complete, the marine vessel(s) will move in and deploy the troops. Alternatively, a sudden raid by marines may be able to get inside the facility and disable many of the defenses. Long-term plans, for example during a campaign of conquest or liberation, generally call for naval operatives to be planted inside sites suitable to use as a resupply point.



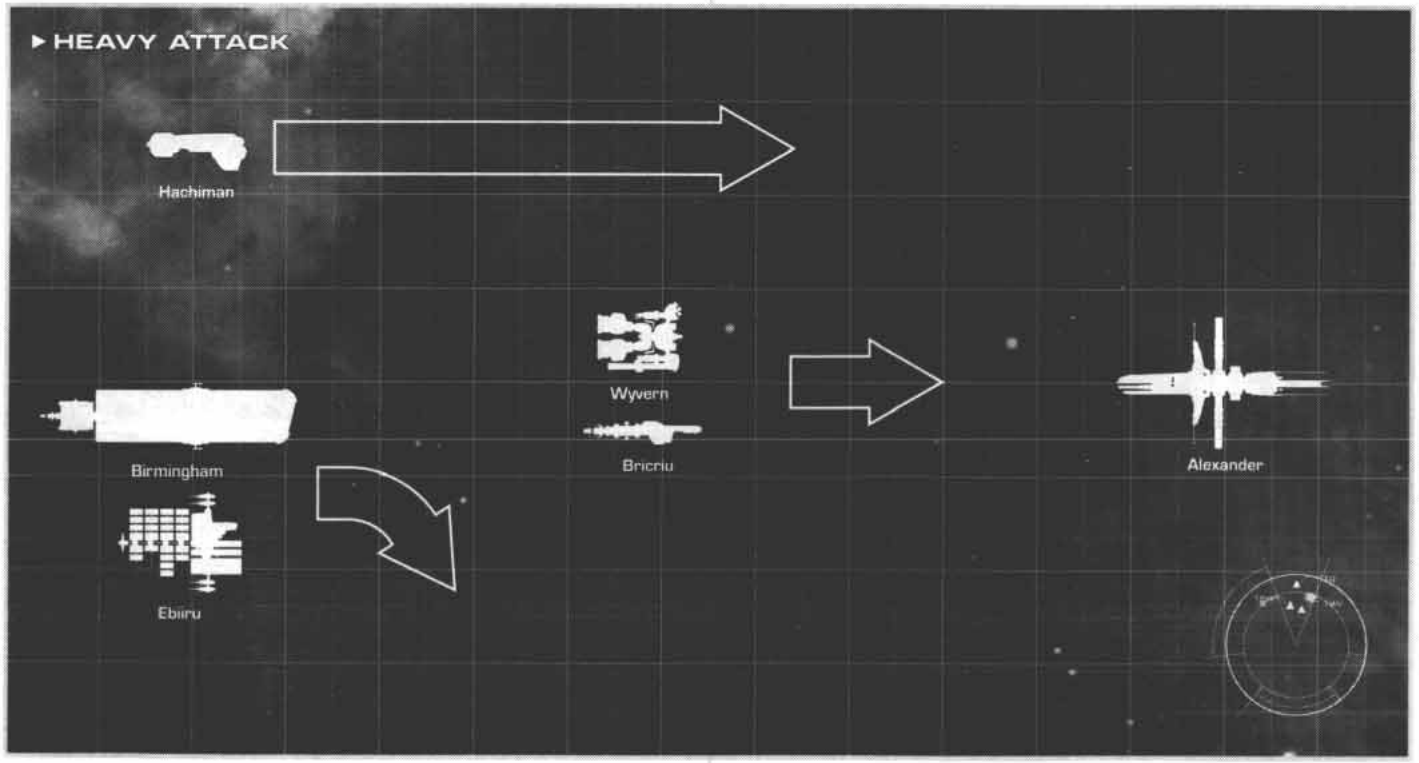
◇ Heavy Attack

As fleets must rely on their supply convoys for continued operation, it is possible for a battle group to be crippled by their loss. In a heavy attack, the fleet is released of the burden to defend the support ships, who are diverted to other vectors in order to bypass the engagement entirely.

In order to protect themselves, the friendly support ships avoid the battle through one of many possible maneuvers. During lightning strikes, the convoy takes a course parallel to the main fleet but outside the possible range of enemy interception. In slower moving battles, continuous thrusting can prevent the enemy from catching up, but is more costly in reaction mass. This latter action is particularly effective when evading exo-armors, which, although accelerating faster, have a much limited endurance compared to the larger vessels. After the battle is decided, the support ships may rejoin the fleet or vice versa.

Another option is to have the main fleet and support ships separate a good distance from the target. The main fleet can then engage in an extended battle while the support ships are still farther out. The support vessels then adjust their velocity so that if it went unchangd they would pass by the battle at lightning strike velocities. As they draw nearer, they can use passive sensors to decide whether to slow themselves down or continue on past.

If exo-armors are being deployed, either tactics can still be used. It will up to the carrier, however, to rendezvous with the friendly own exo-armors, which have to check their reserves much more closely. If really necessary, the exo-armors will land on the main ships of the line and tether themselves to the hull. It would even be possible to temporarily transfer the exo-armors to the line vessels for a day or two and launch them a few minutes before the battle. These keeps the carrier maintenance actions well clear of any possible harm.



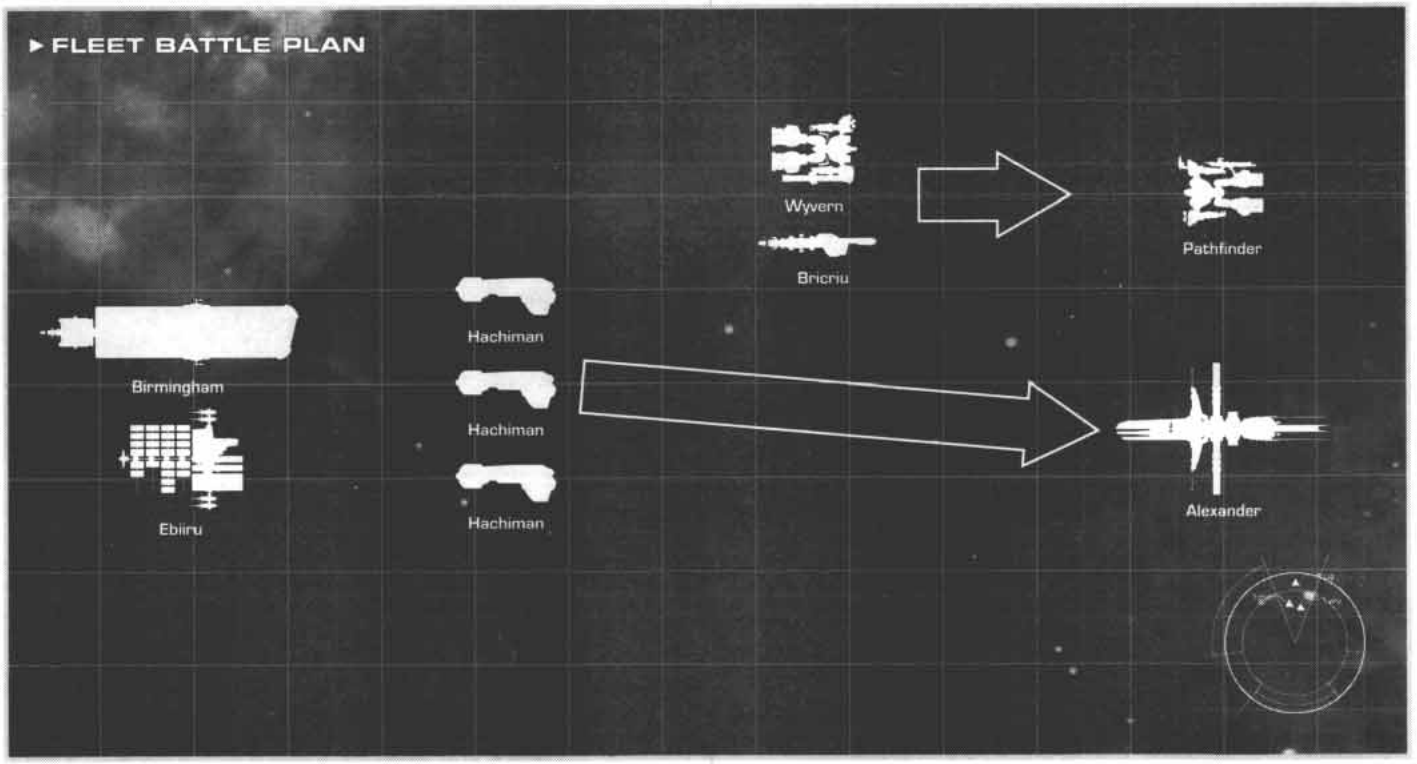
◇ Fleet Battle Plan

The normal fleet battle line consists of drawing the ships up into three lines of vessels. While seemingly oversimplified, its real strength is that very simplicity. Each ship knows where it is to be, and forming up is easily accomplished.

The skirmishers' first priority is the destruction of any other enemy skirmishers, such as exo-armors and interceptors. It is known that the Jovians are heavily dependent on their exos, and if they can be defeated, one of their their fleet's main foundations will have been removed. With the transport assets in the rear, the enemy will be forced to try and break directly through friendly lines. This draws them into the short range engagements prefer by CEGA officers and to which Navy ships are well-suited.

The second stage of engagement is to bring the Ships of the Line to bear. Until the enemy is within range, these ships should be evading to avoid lucky hits by enemy skirmishers. At the point of commitment the line, as one, should fire all their batteries at high priority targets, will should already be tagged by this time. Tactical evaluations suggest that concentrating the first volley of fire on roughly one third the number of friendly ships at most. (thus each enemy is fired on by three friendly vessels). The line will quickly break open with gaps that can be exploited by the skirmishers or by assault ships.

A third phase may occur if the battle drags on. If the two lines cross, the support ships will scatter to the flanks. Enemy units that break through will likely scatter as well. The battle line must thus have the discipline to achieve a victory by maintaining pressure on the bulk of the enemy line. If the enemy carriers are destroyed, then the exo-armors it carries can be considered destroyed as well. If the upperhand is gained in the skirmisher engagement, it may be possible to dispatch high thrust units to block any enemy's attack on the friendly support vessels.



◇ Cavalry Battle Plan

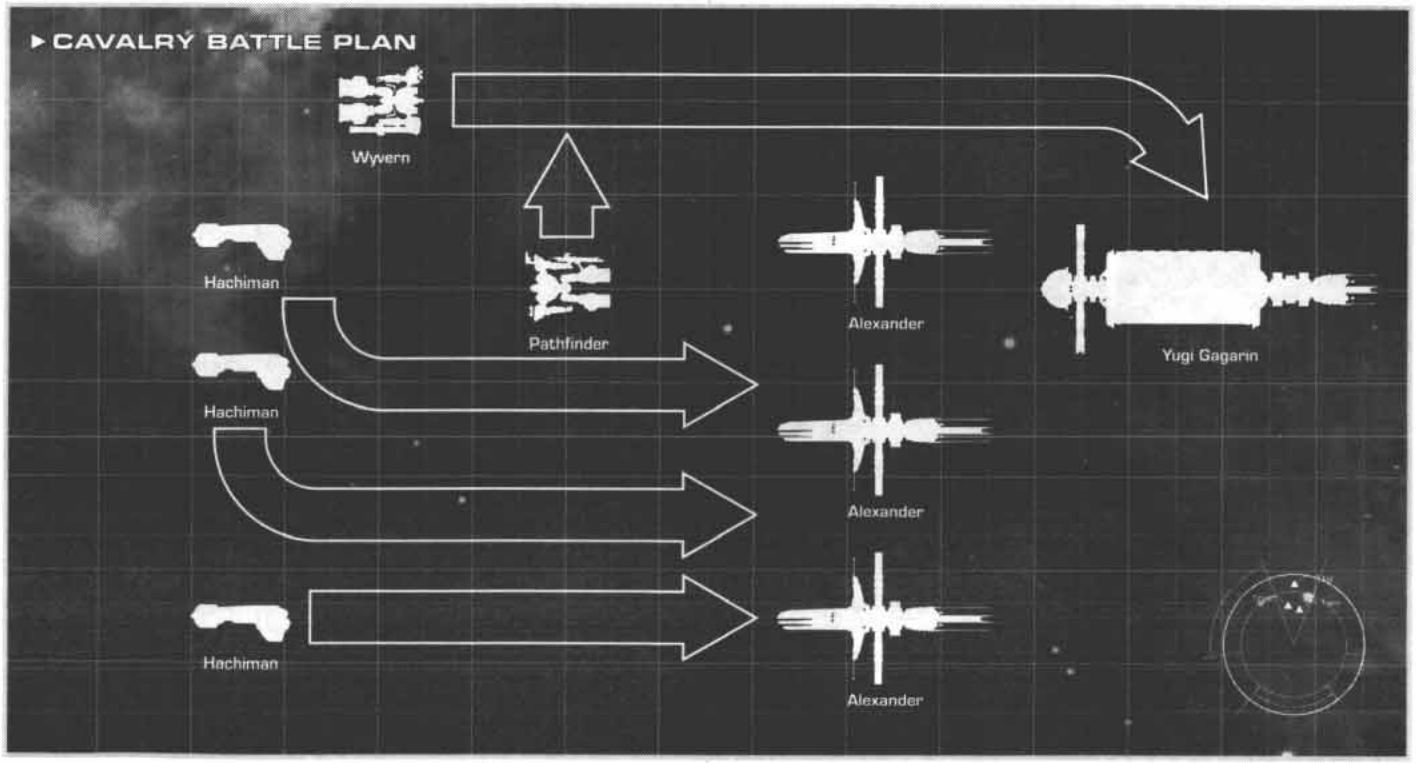
Sometimes political issues or matters of physics mean the enemy have limited maneuverability. It may also simply be the case that he has low-thrust vessels, or has sustained battle damage. Whatever the case, it is an advatange that must be exploited for maximum success in battle.

As the fleets approach, it is desirable to attempt flanking maneuvers with high thrust units, such as exo-armors. This will have three possible effects: one is that high thrust units which could counter later maneuvers are now committed to a distant action. Second, it is easy to lure the enemy into expanding his line, which is especially likely when some of the attacking line moves to support positions for the flanking efforts. Third, the enemy may tighten its force up around the primary target, which then makes them vulnerable to wave attacks or massed firepower on high value targets. The superior thrust advantage allows friendlies to engage only part of the enemy force, whereas they have to spread over multiple fronts.

Our forces near the selected target flank should mass in quickly and be prepared to come into action one at a time. Local superiority can then be acquired to destroy a good portion of the enemy fleet.

The forces farthest from the selected flank should engage the enemy's middle. They act as a holding force, preventing the enemy from gathering in the target area. The forces committed there must be careful in choosing when to withdraw, to avoid being caught in a local inferiority situation.

Once the target enemy sector is crippled, the ships will regroup into a proper battle line, either to repeat the assault, chose another strategy or even move in for the kill, if the enemy has been sufficiently weakened.



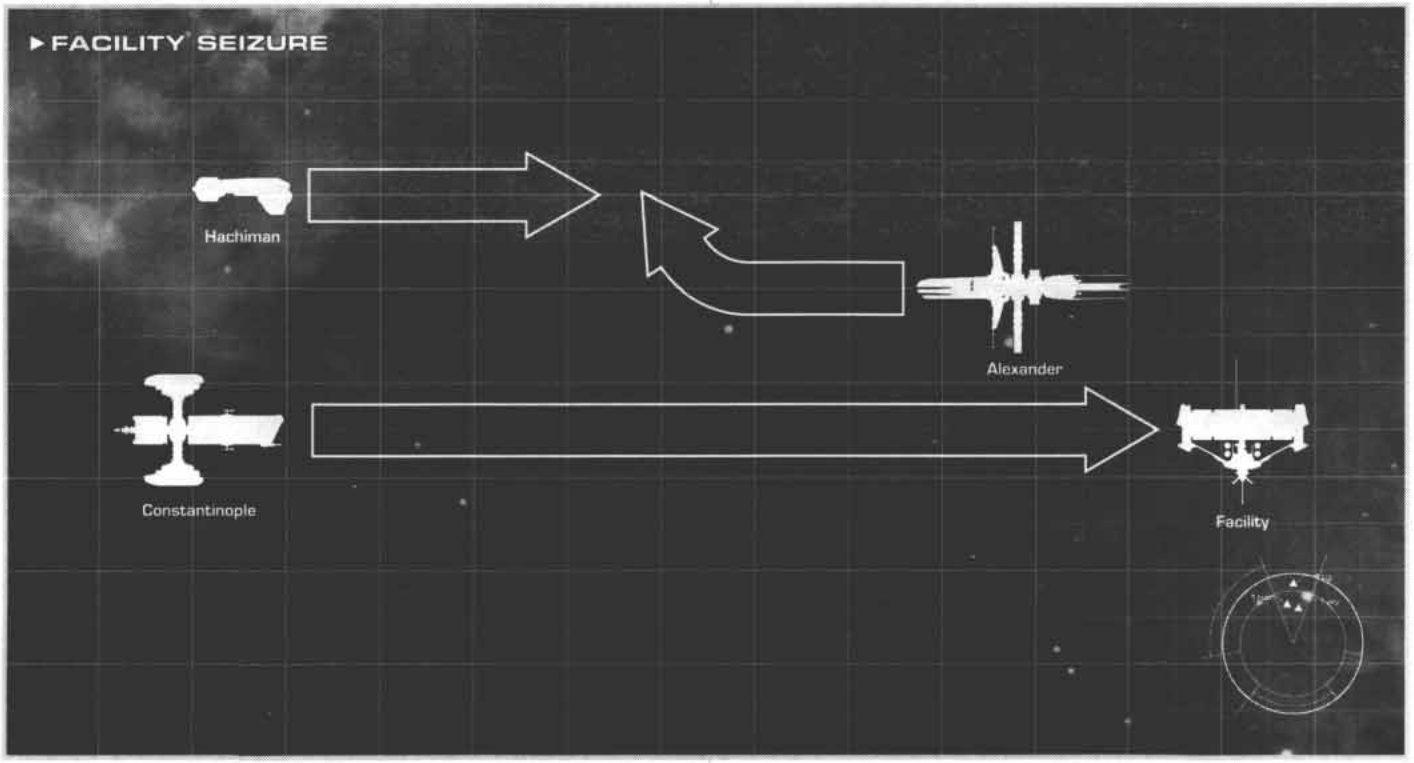
◇ Facility Seizure

Seizing a facility is a complicated issue. The first phase of battle should be an attempt to gain complete space superiority. Enemy warships still operating in the area can inflict massive damage to the boarding parties by firing on the assault vessel before they get a chance to launch. If the enemy fleet can be destroy quickly, then the landing ships may be deployed at minimal range.

The second phase of battle is the assault proper. Weapon placements capable of disrupting the landing force will have to be silenced: exo-armors are particularly useful in this roles. Marines have also shown that exo-suits can break into defense emplacements and disable it from the inside. Dragoon Kobalt teams have a found an effective tactic to gain access: cut open the armor with the hatchet, then fire a grenade barrage inside. These cluster bombs will scatter around, explosions will blow through entire walls and shrapnel will bounce around off the heavier bulkheads, hopefully hitting something soft in the process.

Skirmishers play an even bigger part in facility engagements. For one, the ranges are forced into to being much shorter, generally where skirmisher weapons have their full effect. The other issue is that the facility may be reserving some skirmishers of their own for point blank defense.

Jovian exo-armors are a difficult issue to handle when attacking one of their facilities.It is therefore necessary to give the impression that the intention is to destroy, not capture the facility. This will force the exo-armors to engage at longer ranges. If they await the landing force, they could unleash missile attacks within the minimal range for defense systems and also bring their plasma lances into action on the landing craft while they unload.



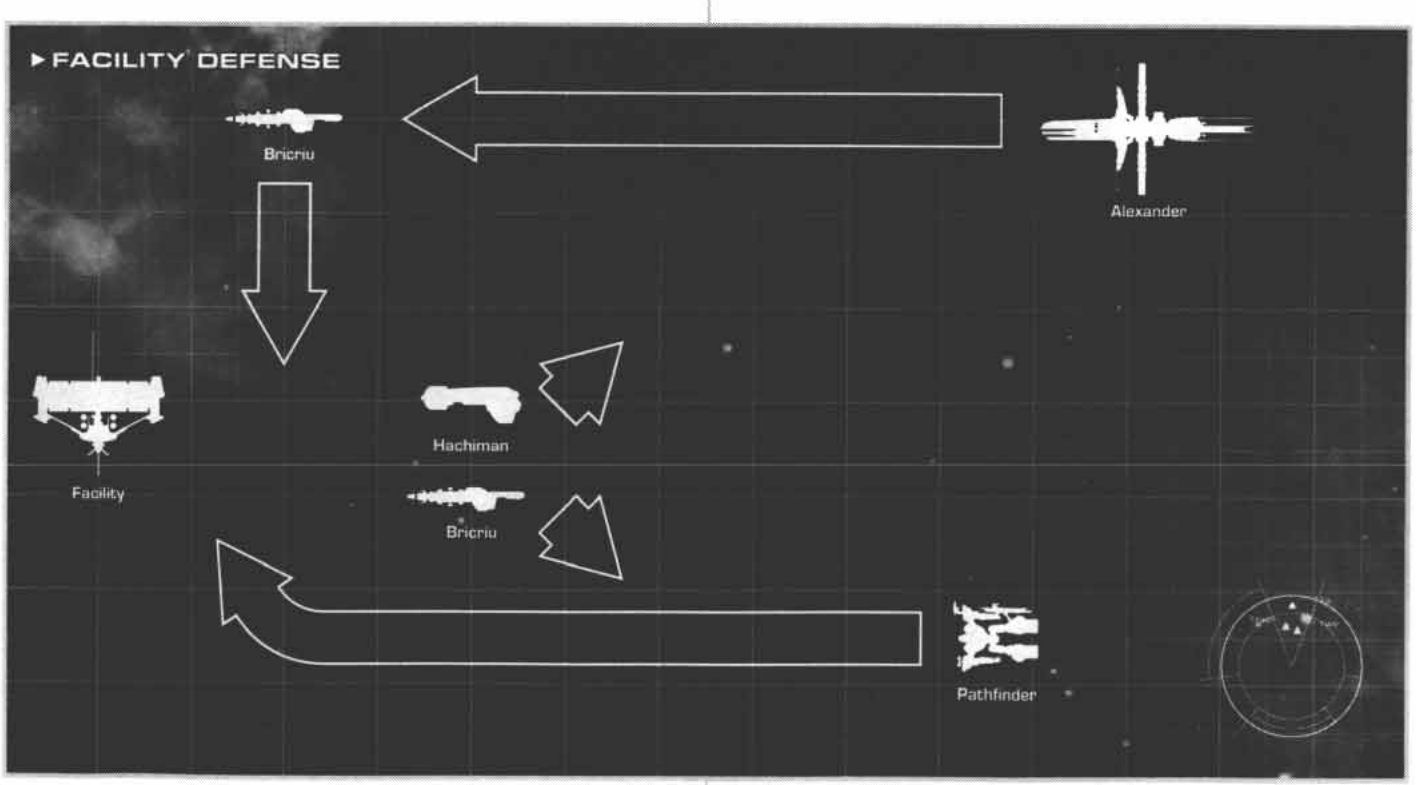
◇ Facility Defense

Defending the area around a facility or installation is an entirely different type of operation than being on the offensive. Enemies will often resort to wave attack tactics, trying to disable more and more of the defensive installations each time to gradually wear the defenders down. This will continue until the defenders can no longer present a credible threat to the invading forces and are forced to flee. This assumes, of course, that they could count on sufficient forces to begin with.

The most likely assault strategy is to attempt to outflank the friendly heavy battle line with exo-armors and other agile combat craft. Friendly skirmishers will have to counter such movements with extreme prejudice, lest an opening is created in the defensive line. A reserve skirmisher force, if enough vehicles can be spared, is always useful to eliminate enemy units which manage to break through or begin attacking the ships of the line stationed nearby.

The ships of the line have conflicting objectives to perform. On one hand, they have to avoid being overrun by enemy auxiliary combat craft. They must remain within the close area of the facility, however, to prevent the opponent's line or assault forces from bearing down on their target. In between sorties, combat engineers will generally have the opportunity to repair and rearm the ships.

Defense of the facility itself should not be negliged. If a Constantinople-class marine assault vessel is present, the option of using her marines in a defensive fashion is certainly available. Once dug in, these ground troops will require a massive military undertaking to dislodge if one wishes to take the installations in working order. Even if the enemy gains control of the facility, the marines have standing orders to switch to guerrilla tactics. In a large scale war, this can force the enemy to expand major resources to a few facilities — resources which cannot then be used elsewhere.



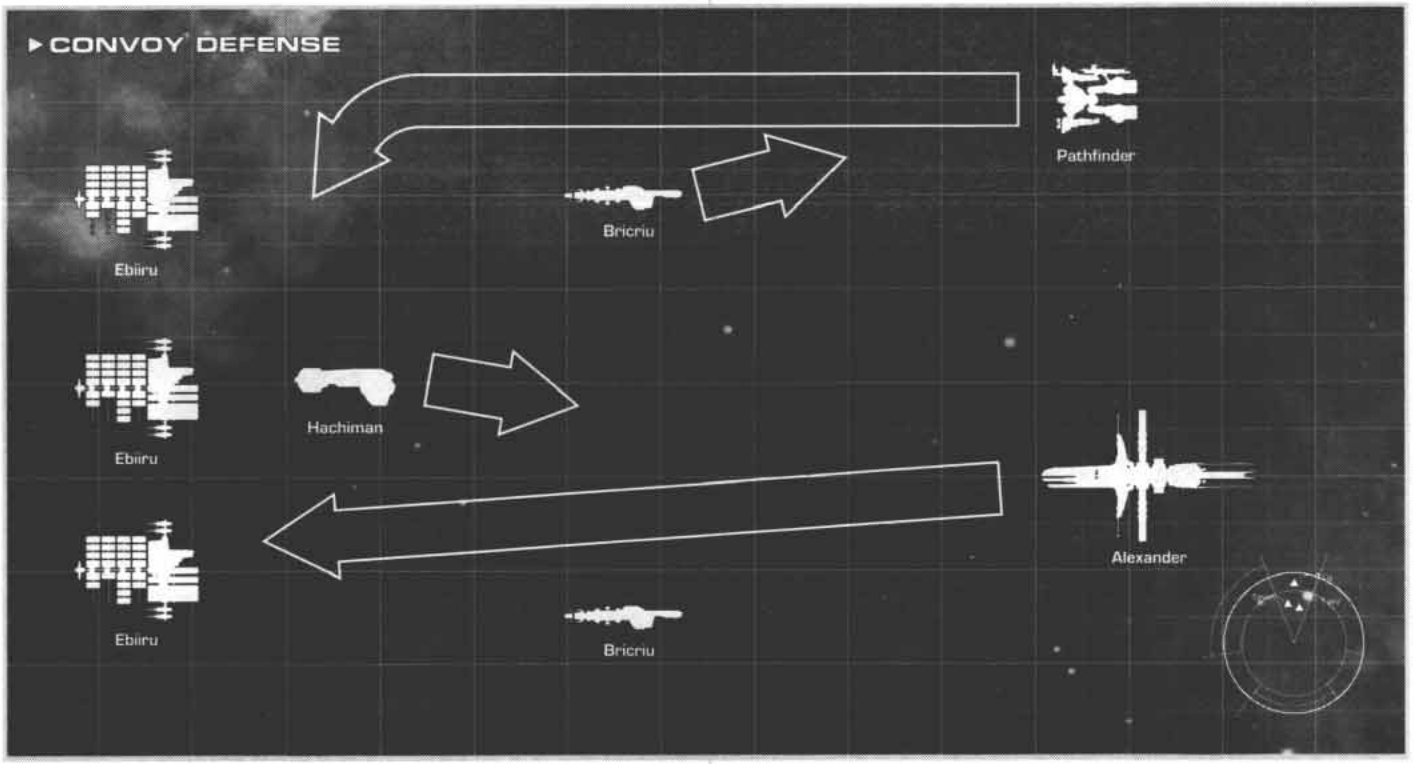
◇ Convoy Defense

One major difference between defending a convoy compared to a facility is the number of targets. The numerous vessels each can be targeted separately. Maintaining the convoy together itself can be difficult. Defending resources have to adjust to defend different targets. Thus they prefer to position themselves on the flanks of the likely route of attack.

As with a facility defense, the objective is to arrange the defensive vehicles so that like intercepts like. It is possible that the enemy may send in a heavy ship to raid the convoy, and thus most convoys need to have a heavy warship of their own. The major problem in organizing merchants convoys is this: ships move individually according to high quickly they load and unload the cargo. Small convoy groups limits the impact of having loaded ships wait for the rest of the convoy, but require the most amount of warships to protect. Large convoys are the easiest to protect but are most likely to be the target of a major enemy action.

If the defenders have been bypassed or forced through, one final defensive option remains: that is for the convoy to scatter. In fact, the merchant crews will likely do this almost instantly even if the breakthrough unit has little ammunition left and present only negligeable danger.

Regrouping a scattered convoy is a tiresome job. Some merchant crews will attempt to dash their delivery through, others will mill about scanning to see if the area is safe again, others will abort thrusting to conduct rescue operations and some may abort the delivery all together and just try to get back home. Scattering the convoy, however, is an excellent means of avoiding exo-armors as these light units do not have enough fuel to intercept all the convoy's ships and still get back to their carriers. A counter-offensive launched against the enemy carriers may force his exo-armors to abandon attacking the convoy for fear of being stranded in space.



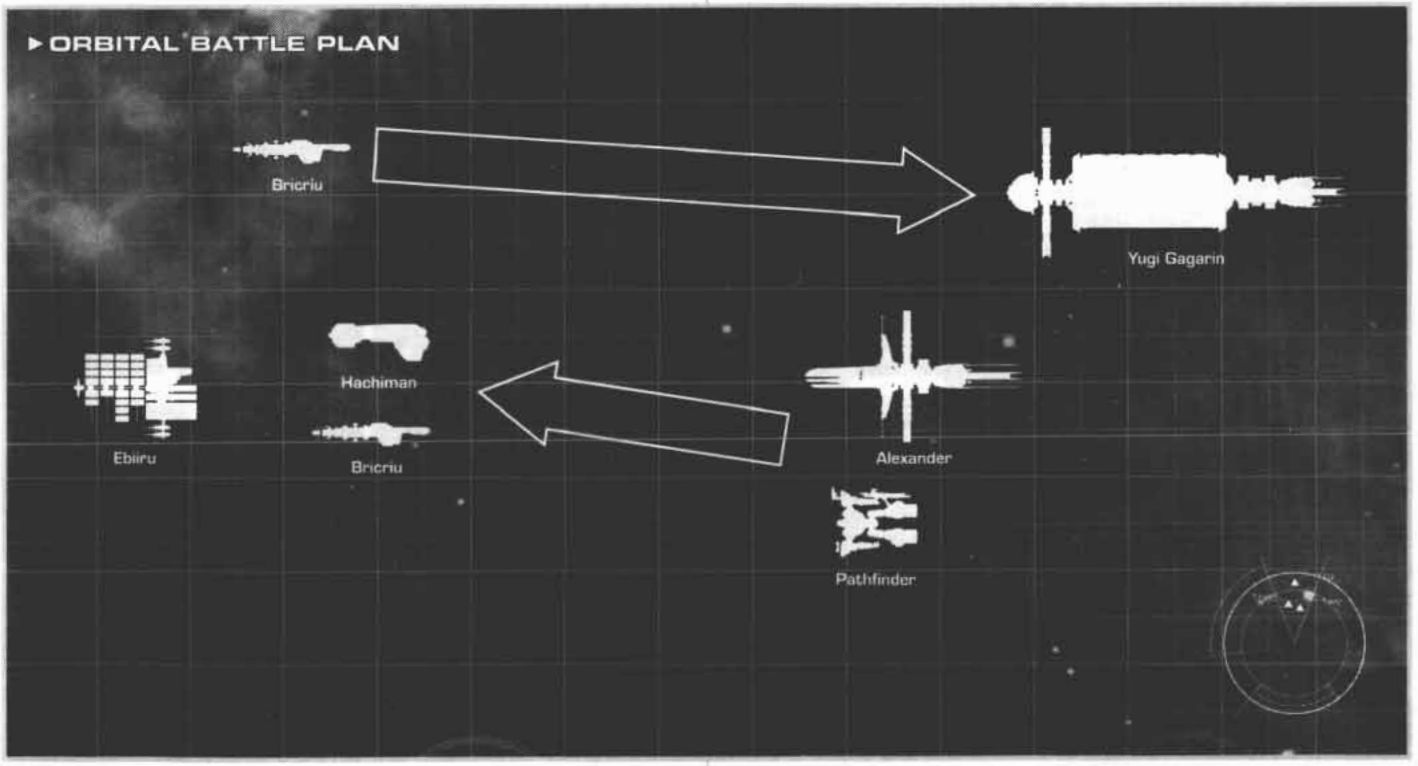
◇ Orbital Battle Plan

Orbital gravitational mechanics forces engaging fleets to either conduct extended battles or lightning strikes, but not both. Extended battle tactics are fought using roughly the same tactics as normal. In the lightning strike situation, however, the two fleets will again meet in a brief time as their orbits intersect once more. Between engagements, ships will have the opportunity to repair and exo-armors and fighters to reload. The exo-oriented Jovian Armed Forces will likely have the upper hand in orbital battles, unless its carriers can be taken out.

The ships of the line and a few defending skirmishers will group into a tight defensive pattern. The support vessels will be spaced behind them. Due to the nature of orbital mechanics, engagements will occur in the forward arc of the direction of travel. Therefore, firepower is usually concentrated there to attempt to smash through anything hostile.

In the meantime, a detachment of high thrust skirmish units can make an attempt on the enemies carriers by moving into a different orbit. If the enemy defends against this by grouping the carriers with the battle fleet, the balance will be restored in the CEGA's favor. When the fleet encounters the carriers and battle fleet, the firepower will be concentrated on the carriers. If the enemy disperses them, then they become vulnerable to ambush due to the curvature of the planet: by the time a unit is seen cresting the planet's horizon, there will be insufficient time to escape an encounter and probably destruction.

Multiple groups on both sides can be moving along multiple orbital paths. This creates a series of confused engagements, but is more likely to catch the enemy carries at some point. This is a more a reckless plan, but may be useful in a heavily defended enemy area.



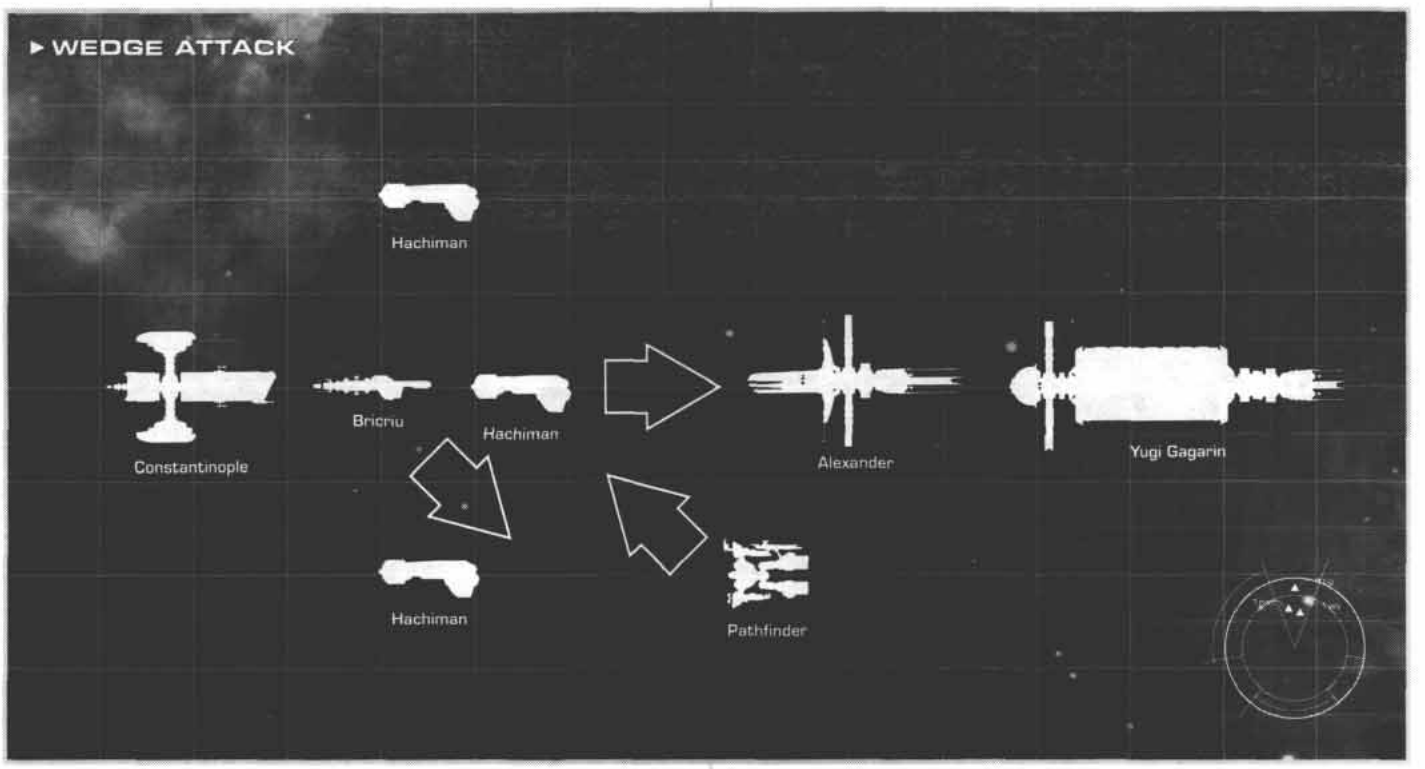
◇ Wedge Attack

Sometimes the best defense is a strong offense, even if this means plowing straight in the middle of a heavily armed enemy formation. The basic principle of the "Wedge" battleplan is to lead the attack force with the strongest units, since they will have the greatest chance of smashing through the enemy lines. This tactic is often used to support an assault operation since it forces the enemy to commit to defend along the route taken by the friendlies. Otherwise, the lead ship will penetrate straight through into his rear area. Following in the wake of the wedge gives the assault ship the clearest and most direct path to the target.

Ships of the line placed on the side of the formation serve to protect the lead ships and the rest of the formation from flanking attempts. Skirmishers are placed behind the lead ship for close-in protection; should enemy units attempt to engage the lead ships at close range, these skirmishers will advance to meet them.

Enemy units which break into the center of the wedge will find themselves in a deadly crossfire from the heavy ships placed on both sides of the formation. Furthermore, this also places them at the mercy of the lead ships' protective skirmishers, who will then be at minimum range.

The major drawback to this plan is the heavy damage the lead vessels will inevitably take. It is possible that a heavy concentration of firepower may break the point of the wedge and leave behind a relatively hollow center and two separate battle lines which might be individually attacked and perhaps even overrun. In such a case, it is crucial that the formation regroups as soon as possible, less even more damage be sustained.



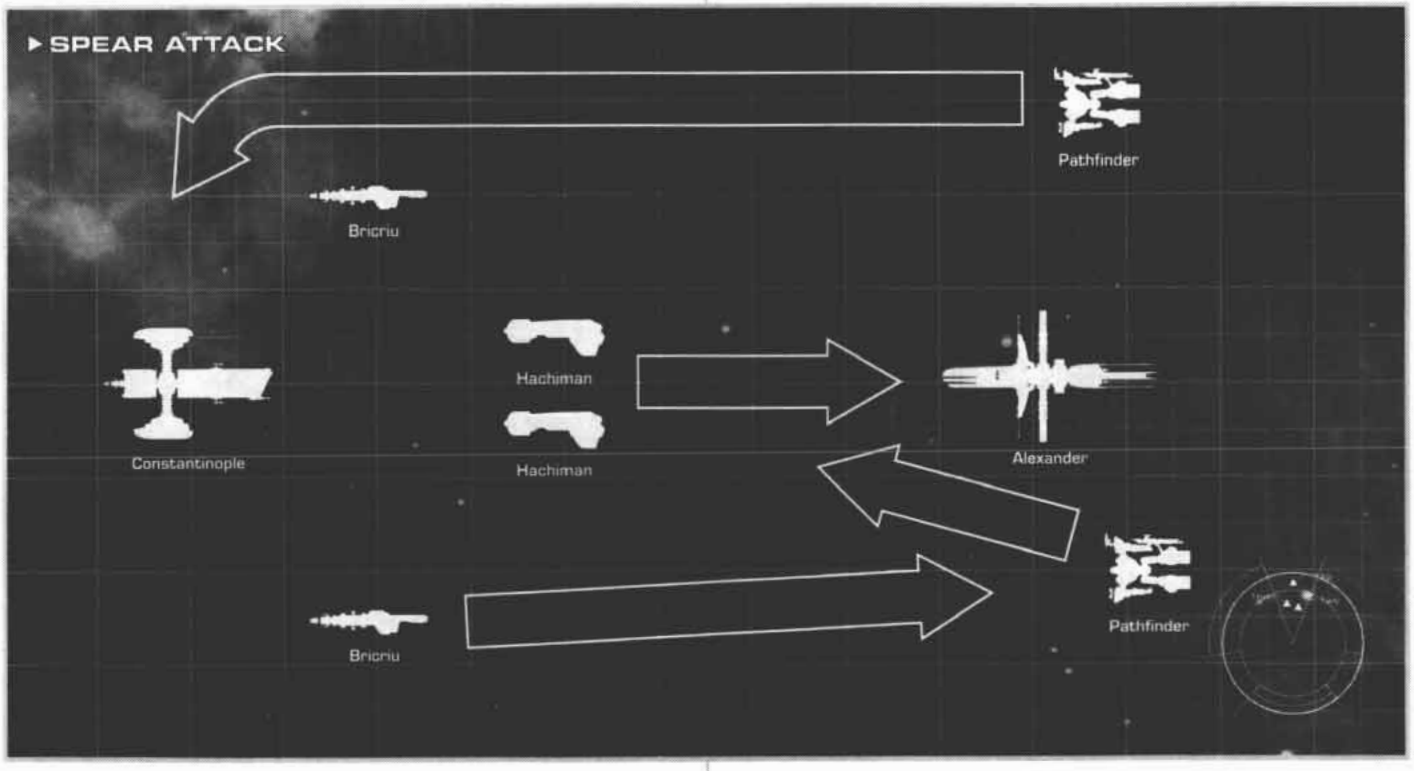
◇ Spear Attack

The attack formation known as the spear attack is a variation on the classic wedge. Instead of placing heavy ships on the sides, the skirmisher units are deployed there instead. The entire battle line forms into a tightly packed formation found at the tip of the wedge. This gives the ultimate concentration of firepower, as nearly all ships open fire on the same target. Assault and support ships are placed at the rear as before to take advantage of any opening in the enemy line.

From their positions to the sides, the skirmishers can intercept exo-armors or other fighter craft moving to engage the battle line or attempting a flank attack on the support ships. The crossfire amid the spear point will be far too strong for enemy skirmishers to break through at that point.

The disadvantage to this formation is the heavy reliance on the spear point itself. Even the very strength of the formation, the close proximity of the lead vessels, puts them at risk if one of them suffers a core explosion. If the enemy has a means of breaking it up, perhaps a minefield, the entire fleet can suddenly be in jeopardy. In deep space battles, however, the enemy generally will not have had the time to deploy these measures, reducing the risks inherent in using the spear attack.

As before, the assault ships will be able to move in the wake of the lead force. Since the formation is much narrower so to is the safe zone. An assault ship strays to one side may find itself engaged with an undamaged enemy ship of the line or under close assault by skirmishers.



◇ Pincer Defense

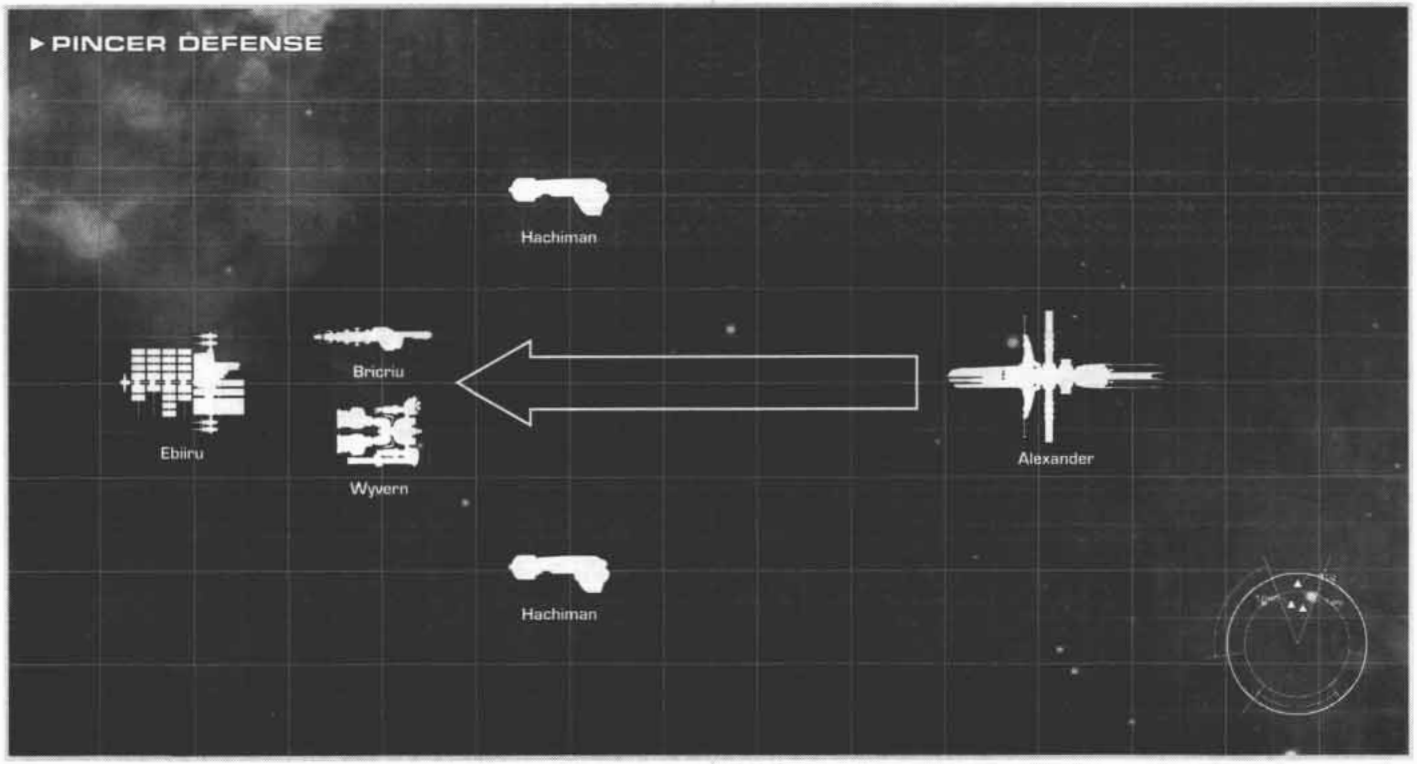
Whereas the wedge was a "V" formation with the point facing the enemy, the pincer defense presents the opening. The appearance of vulnerability is part of the plan to lure the enemy into the death zone.

The outer edges of the V are made of ships of the line, while the inner sections are the skirmishers. The support ships are at the point in the V. By offering the support ships as a target, it appears to the enemy that the battle line is broken. In fact, a few ships in the middle may intentionaly withdraw after a few exchanges of fire to add to the illusion.

This formation is intended to take advantage of the weak side armor of the Jovian designs. By moving into the center of the V, the enemy finds itself in a crossfire. As the enemy attempts to engage the support ships, he enters into close combat with the skirmisher and exo-armors.

The risk in this maneuver comes from the possibility that the enemy may adjust course to engage only a single branch of the V. If this occurs, the section under attack should adjust into a flat line perpendicular to the oncoming attack. Meanwhile, the other section approaches in a line of ships parallel to the attackers course. This will form a formation looking like a "T" or an "L," depending on the position of the reinforcements. Once the attack breaks through, the forward battle line is engaged in succession by the other wing. By the time the enemy will have reached the target, he will have taken heavily losses — perhaps even enough to cause a retreat.

In the case of a lightning strike deployment, the enemy will not have the opportunity to adjust where he hits the V formation. This is where this formation excels at destroying hard striking but very directional ships, such as the Jovians' Alexander-class destroyers.



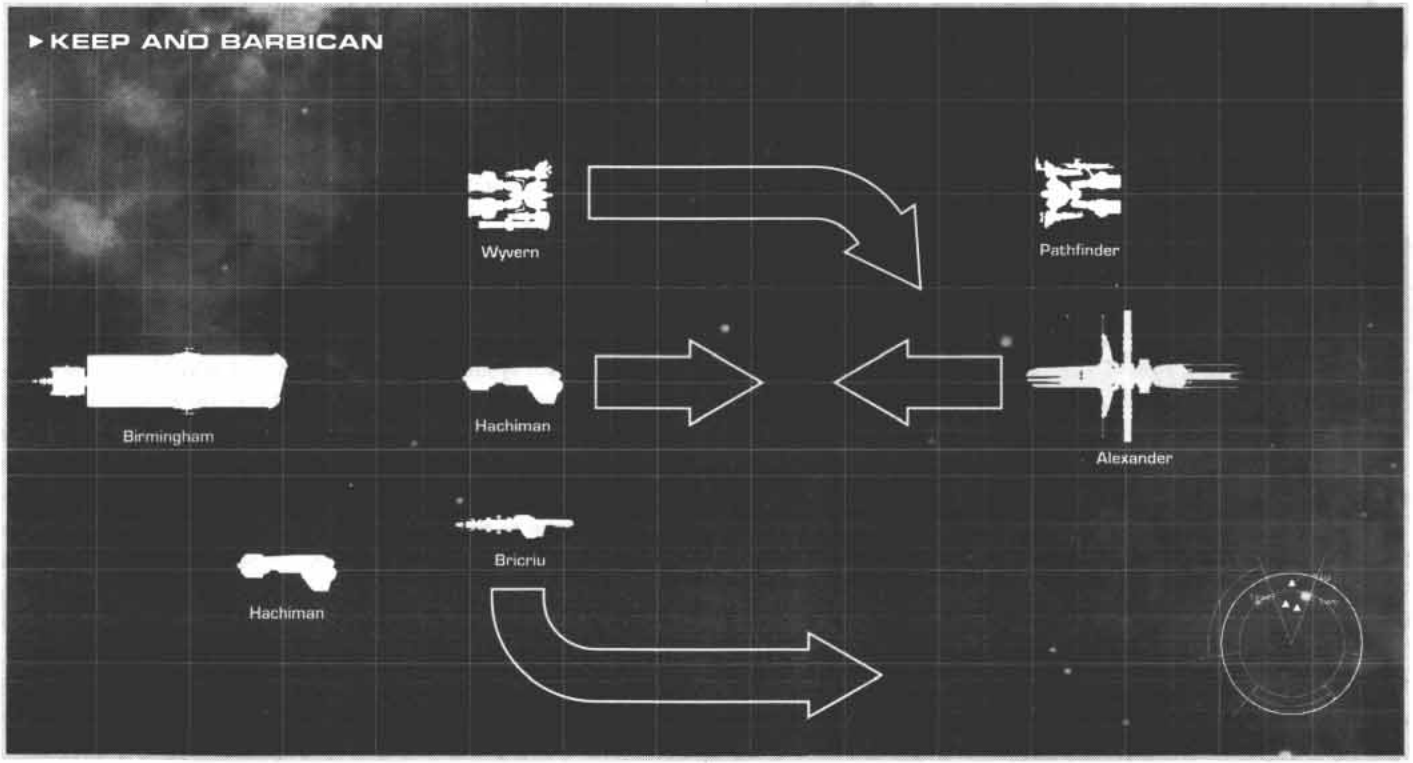
◇ Keep and Barbican

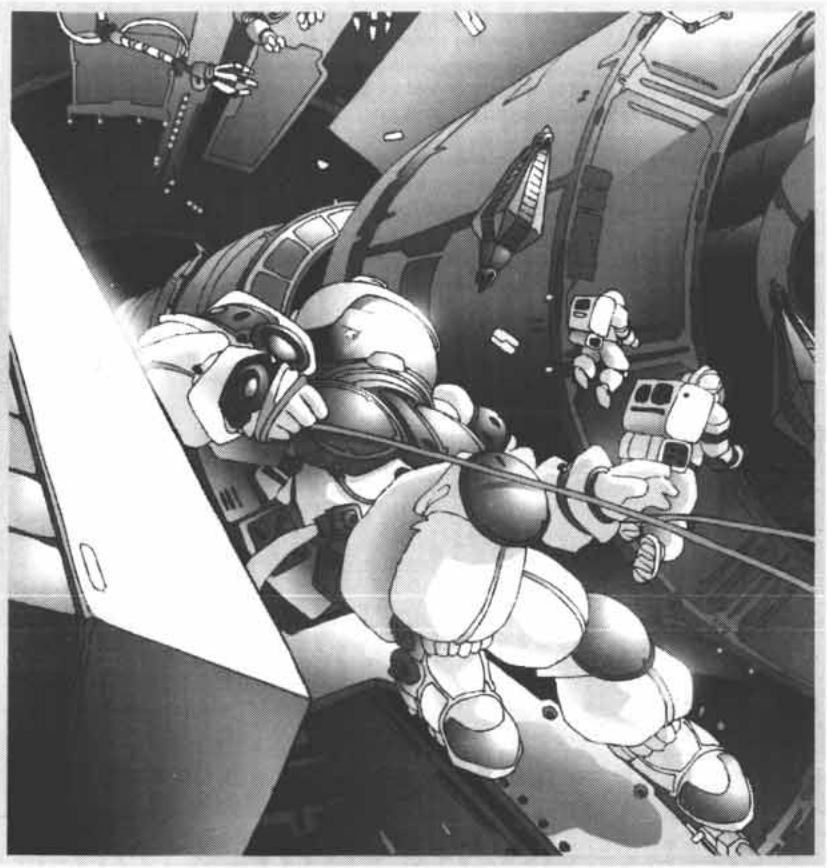
In this battle plan, the friendly forces form up into two lines, with the outer line formed of skirmishers and some heavier vessels for added firepower. This outer line, called the barbican, seeks to disrupt the main enemy thrust by probing it to find weaknesses. The second line inflicts the killing blow as the enemy units come through the first line. Casualties will be heavy in the first line, but the second will earn a victory for the fleet.

A portion of the ships of the line occupy the center of the barbican. These seek to inflict damage that can disable the enemy, such as firing on turrets and engines. Their function is not necessarily to destroy, but rather to disable as many ships as possible. Exo-armors and skirmishers on the sides of the barbican will then close in on enemy exo-armors or on targets of opportunity.

The keep has in its center the valuable support ships that will be the target of the enemy's thrust. The rest of the battle line rests on either side. As with the pincer defense this ships may be able to catch the enemy ships in a crossfire. If heavily pressed the support ships will turn off to one side. Should the enemy pursue, he will be leaving his rear exposed to the line ships on the other side.

The risk to the friendly fleet is that the support ships may not be the enemies' main target. It is possible that they may concentrate fire solely on the barbican, devastating it. Alternatively, they could move off to only engage the ends of the keep formation, with similar results. In this case, it is still possible for the rest of the "keep" formation to exchange fire with the enemy on his sides.





▼ 5.6.3 Boarding Actions

Engaging an enemy ship or station through the use of a boarding action circumvents the heavier weapons and allows the target to be captured. Even in the middle of a major battle, marines may be used to board a ship simply to destroy it from within. Even if the marines are unable to destroy the ship, they can inflict massive casualties among the crew. The following rules greatly expand on how to run a boarding action.

Detailed rules for running infantry fights are available on pages 92-94 of **Jovian Chronicles Companion**. These rules describe how to inflict damage on infantry units and how they operate in combat in the Vehicle Scale. Ship interiors count as Dense Urban Terrain for movement and combat purposes (see page 88 of **Jovian Chronicles Companion**).

The following tables (see page at right) break the major ships down into battle zones. Combat should take place in these as if each zone was a single hex. Studying the picture of a given vessel will give an indication of how sections are joined. Unfortunately, there are so many ships available as to make presenting them all graphically impossible. A sample small colony, that could house 50,000 to 100,000 persons, is included in the chart.

Most ship sections do not fit entirely into the basic "one hex per 50 meters" rule in the **Companion**, and each ship includes several different types of sections. Instead, the numbers given have been based around the layout of the ship's interior, how difficult it is to move between sections, where major bulkheads would be located and how the defenders are likely to organize themselves.

The main hull of a ship is made up of three different types of section. The Bow section represents the frontmost portion of the ship, where the firing ports for spinal weapons, most missile bays and the sensor systems are located. Each ship will have one Command Section deep inside the hull where the bridge and computer section are found. Hull sections are all the other spaces in the main hull. Note that in order to reach the Command Section from the outside, one must first move through a Hull section. Interior damage to the Bow, Command or Hull sections will all be applied to the main hull of the ship, except for determining crew casualties. Crew losses are only applied to the forces currently in the section. Therefore, during the starting turn of a boarding action, the defender will have to determine where the crew is. Gamemasters are advised to have units spread around the hull to reflect those operating the various systems.

Ships may have additional sections with more equipment in them. Weapon sections each represent a single turret or weapon pod mounted outside the main hull. Cargo areas, including hangar bays, may be part of the main hull or be attached sections. Engines are the propulsion units of the ship. Almost all spaceships in Jovian Chronicles have engines as a separate section outside the main hull.

The "Other" category includes any other section not covered by the above. This includes unit that have separate comm array sections for example; it also includes the bracing struts of a Valhalla station. Ops sections of Jovian vessels also appear here.

Units may only attempt to enter a section containing enemy units if the section they currently occupy is empty. So long as opposing units are in the same hex, infantry may only move to unoccupied hexes or those containing friendly units. Many sections may allow units to move outside the vessel without worrying about this (GM's discretion, but in general only the Command section has no direct access to the outside).

Fire may only be directed against units in the same or directly adjoining sections. Attacking in the same hex is treated as being at Point Blank range. Fire into the next section is treated as a range of one. Area effect weapons are especially destructive: any section receiving an Area Effect attack is treated as if the section had been fired upon directly with a Defense roll of zero (this is in addition to possible damage to units inside). Due to heavy bulkheads, area effect attacks do not spread into other sections.

Rather than fire on enemy units, a unit may attack the ship's systems directly. If a unit is able to inflict 50 points of damage (Vehicle Scale) on a section, a roll on the System Damage table should be made to determine the effect. Every additional fifty points should be treated as a Heavy Damage result. Neither will reduce the Armor value, which mostly represents protection against external attacks. Damage points applied in this way are cumulative between turns, just as if the ship interior was a building.

Civilian Boarding Sections by Ship

Ship	Bow	Cmd	Hull	Wpns	Hab	Car	Eng	Other
Scout Ship	-	1	-	-	1	1	1	-
Ebriiu	1	1	-	-	-	4	2	-
Valhalla	-	1	4	varies	24	1	-	4
Anopheles	1	-	-	-	-	-	1	-
SolaPol Cutter	-	1	-	-	-	-	1	-
SolaPol Quick	-	1	-	-	-	-	1	-
SolaPol Cruiser	1	1	1	-	2	1	2	-
Small Colony	-	4	48	varies	240	48	8	varies

Military Boarding Sections by Ship

Ship	Bow	Cmd	Hull	Wpns	Hab	Car	Eng	Other
Godsfire	1	1	4	4	4	1	4	1
Valiant	1	1	3	2	4	3	4	-
Thunderbolt	1	1	2	3	-	1	2	-
Javelin	1	1	2	2	-	-	1	-
Athena	1	1	3	4	-	-	2	-
Forge	1	1	2	2	4	11	4	1
Alexander	1	1	4	4	4	8	4	1
Yuri Gagarin	1	1	1	-	6	36	5	3
Corsair	1	1	1	2	-	1	2	-
Intrepid	1	1	2	4	-	10	2	1
Ypres	2	1	6	10	4	10	4	1
Majestic	1	1	4	4	6	22	4	1
Lennox	1	1	1	-	6	48	4	5
Bricriu	1	1	1	4	-	1	1	-
Uller	1	1	2	2	-	1	4	-
Hachiman	1	1	3	4	-	1	2	-
Tengu	1	1	2	2	-	3 or 5	2	-
Poseidon	1	1	5	6	4	1	2	-
Hydra	1	1	1	-	-	-	1	-
Constantinople	1	1	4	2	4	2	2	-
Birmingham	1	1	3	2	-	4	2	-

▶ JUSTICE

With hands manacled and legs shackled, the prisoner was yanked roughly into the courtroom. Another prisoner, head bowed, was being led back to his cell. A reporter in a CEGA uniform adjusted her camera headset to focus in on the judge. Known for his harsh policies, Judge Marcus was always good for a soundbite or two.

A bailiff stood up, turning on his recorder. "Prisoner number 6 has been identified as William Scott, accused of acting as a leader for the terrorists."

"Terrorists!" screamed William, his eyes wild. "You're trying to overrun the entire system! Someone has to stop you!"

"Quiet!" said Judge Marcus. "You are only required to answer questions, not make statements."

"Where's my lawyer?" William shouted out, "This isn't. . ."

"You're bordering on contempt of court, young man. Bailiff, please keep the prisoner quiet," Judge Marcus demanded. Moving to the booth, the bailiff stood beside the man, murder in his eyes.

"Did the accused take direct hostile actions against CEGA?" Marcus asked, weariness evident in his voice.

"We have been unable to verify if he used weapons against our forces. This audio information was recorded by the colony. Here is a sample." William's voice resonated throughout the courtroom, tiny from the reverberations on the recording, but still perfectly recognizable. *Kill that suit before he gets his other grenade off. Damn it, get back there and shoot him!*

Judge Marcus nodded and slammed his gavel down. "William Scott is found guilty of terrorism against CEGA. He is sentenced to a lifetime of labor in service to the people of Earth. He will be allowed to petition for parole after ten years, pending a psychological review. Put him in the brig and bring in the next prisoner."

* * *

"It was so grateful of you to give us the terrorist's transfer vessel to cover the damages here," the colony official commented, his hands twisting in nervousness.

Goering replied smoothly, amusement in his eyes, "I am glad you found it acceptable. Your assistance is apprehending the armed terrorists was quite welcome. However, I suggest you take much better precautions against any sort of recurrence."

"Well," said the mayor slowly, "we do what we can."

Goering smiled internally. The pudgy little bureaucrat actually thought that he could get away with setting up another smuggling ring! "I have been ordered," Goering added, "to leave a contingent here to fulfill our right of Search and Seizure. We will make fair payment for the space rented to accommodate our troops. These orders come direct from the Admiralty."

The mayor's face fell even further than Goering had thought possible, but he kept his mouth shut.

* * *

David bounced in the seat of the pickup-like rumble buggy. He was driving inside the curved colony, heading for the position of the marine outpost. He jolted over another break in the road, and cursed softly, glancing back to check on the load of several prefabricated walls strapped to the buggy's deck.

"Let's get our houses up," ordered lieutenant Sharpe, "We have wounded to care for."

Darlene shifted her grip on the controls, and walked over to the buggy. She began to unload the wall sections, the arms of her Minotaur straining slightly under the weight. She glanced up from her work as Douglas rolled in.

"Hey Sharpe," Douglas shouted, nodding to Darlene as he passed. "How about some preferential treatment for the hero of the day, hey?" His leg was still in a cast.

"What, you want a room with a view?" Sharpe chuckled.

* * *

Jonathon Scott watched the CEGA marines through his binoculars. His brother was going to be hauled back to Earth to do scutt-work in some high security agriculture project; CEGA already had him imprisoned on a warship. Jon couldn't get his brother back now, but he could make the Earthers pay for it.

Footsteps echoed directly behind him. His heart jumped in his throat — CEGA had found him. He scrambled forward, trying to get the distance to swing his laser rifle in position. The stranger merely sidestepped.

"Jonathon Scott? SolaPol. I'm just here for some information." He flashed a badge, apparently not worried in the least that his opposite was armed and perhaps intent on killing him. "You're a member of the colony's police force. Where might the backup video records from the assault be kept?"

Jonathon stumbled, the color returning to his face. "You think you can get my brother back for me? Then we'll talk."

* * *

Captain Date brushed a floating strand of hair out of her face. Her officers lined up to her right, each doing their best to stay relatively stable in the zero-gravity of the hallway. A bosun stood opposite her, holding a small silver whistle. Farther down the hall, a pair of marines in dress uniform kept their rifles in the at-ease position. To her left, a viewscreen on the airlock's control panel showed the launch slowly sliding into place. She heard and felt the walls of the airlock vibrate as it pressurized. Then the door slid open and Commodore Goering appeared in the doorway.

"Permission to come on board," he saluted.

"Permission granted. Welcome, commodore."

At once, the bosun blew out series of shrill notes. The pipe carried over the intercom, and everyone on board now knew that a commodore was aboard. His first step onto the *Lexington* meant he was now the senior officer; that he was now in command.

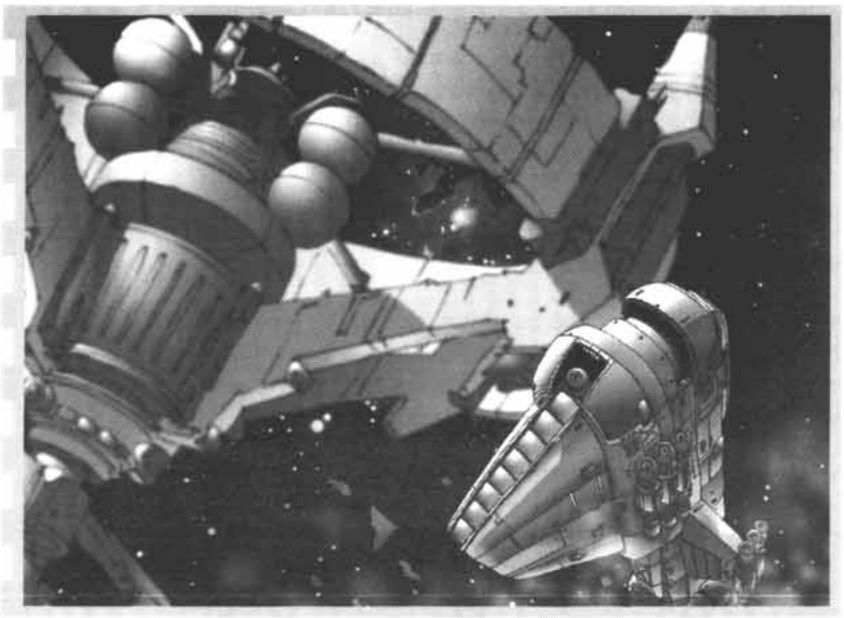
A wounded ensign followed behind him carrying a folded flag. Goering looked over the assembled officers of the *Lexington*, nodding to the captain. "I fly my flag here."

One of the *Lexington*'s marines stepped forward. He ceremoniously floated to the wounded marine. With military precision, he transferred the care of the flag to the ship's marines. The two marines shouldered their rifles and took the flag, marching down the hall to mount the flag beside the bridge.

Alison followed just a hair behind Goering, "What is the next phase of our mission?"

"To hunt down the other escaped transfer vessels. I'm unloading most the marines onto the colony; except for our heroic ensign here, we will be leaving the wounded under Sharpe's tender care. The *Aname* and *Iwo Jima* are to return to Earth. With the *Lexington* as my flagship, we will proceed on with the *Toshiro* and *Hitomi*. A replacement pair of ADB are being sent up the well to support our move." He turned to face her as they stood by the captain's chair, his voice lowered. "I'll be counting on you, Alison."

She smiled slightly as he sunk into the chair and steepled his fingers pensively. "Ensign, open the comm. . ."



▶ 6.1 WAVE STRIKE RULES

Under the normal rules for lightning strike combat (page 143 of the **JC Rulebook**), the two forces are effectively clustered into one formation, a simple mechanic suitable for small engagements or one where the sides all consist of similar craft. With these optional wave strike rules, the tactical possibilities of a lightning strike are expanded to include some deployment tactics.

A wave strike is an advanced form of lightning strike where the two formations dispose their forces to optimize their attack or defense by using successive "waves" of vehicles — hence the name. Wave strikes are resolved using several steps that are referred to as "phases" to avoid confusing them with regular combat turns. A wave strike is still a lightning strike, and unless specifically mentioned, all standard lightning strike rules apply. Each unit still only gets one chance to act for the entire battle.

The high relative velocities inherent to the battle affect it in other ways. Units may still apply thrust to modify their defensive die rolls, but that will cause no change in how the unit moves on the map. Once a unit is deployed for the wave strike, or launches from its carrier, it may not change the direction it faces.

▼ 6.1.1 Pre-engagement Phase

As they hurtle towards or across each other, both factions will try to change their vectors in such a way that they will be at an advantageous distance when they pass by each other. An opposed Space Navigation Skill test is required; the side with the highest Thrust adds +1 to the die roll. The winner of the Navigation roll determines which side will be the "receiving" force. The other side is considered to be the "advancing" force. Ties should be rerolled.

Certain scenarios may force one side to be the receiving or advancing force. A good example of this is a wave strike against a group parked amid asteroids or a wave strike on a colony cylinder. Like in regular lightning strikes, the faction that wins the first advantage can choose to avoid conflict altogether. Otherwise, combat will proceed as follow.

The commanders of the two sides both make Tactics Skill rolls. These determine the number of Command Points available for the engagement, if CPs are being used. Command Points spent for a defensive bonus apply only versus a single attack, and not for the entire phase or strike.

▼ 6.1.2 Deployment Phase

The Wave Strike rules use an hex map to facilitate the resolution of combat (though it is certainly possible to just use a pad of paper, an hex map makes the whole process easier). A large map should be used if there are lots of units in the battle. Obstacles, if any, are placed on the map. These include, but are not limited to, asteroids, comets, debris fields, orbital facilities, etc.

To start deployment, the advancing force declares which map edge they will enter on and which direction they will move in, following a row of hexes. Again, certain scenarios or the obstacles present may limit the available choices.

The receiving force then places its units on the hex map. Units may be placed anywhere beyond the advancing force's longest medium range, plus eleven hexes from the advancing force's selected map edge. For most battles, this distance will be twenty five hexes, which may be used as a general rule of thumb.

The receiving force may only place its units in the general area available to the advancing force. It is not permitted to "hide" units in unreachable hexes, such as map corners. Map terrain items, such as asteroids, are not considered to hide units — they only limit the possible movement "lanes."A cluttered map might require the players to place more than one ship per hex.

The advancing force then places its units on the map. They may be placed anywhere within ten hexes of their selected map edge, as long as they do not infringe on the separation distance mentioned two paragraphs above.

It is assumed that a carrier may launch a number of craft equal to one or its number of catapults, whichever is greater, with a single action. Launching can only be done once per catapult for the entire wave strike. A ship without a catapult can only launch a single vessel during the wave strike.

▼ 6.1.3 Declaration Phase

Each unit must record their total use of movement points for the duration of the strike. These will be used for attack and defense modifiers and will not change the facing of the units or their position on the map. Compared to the great speed at which they meet, the vector changes won't take effect until a few seconds after the exchange, though they will affect the vehicle's position enough to throw off the enemy targeting.

▼ 6.1.4 Battle Phase

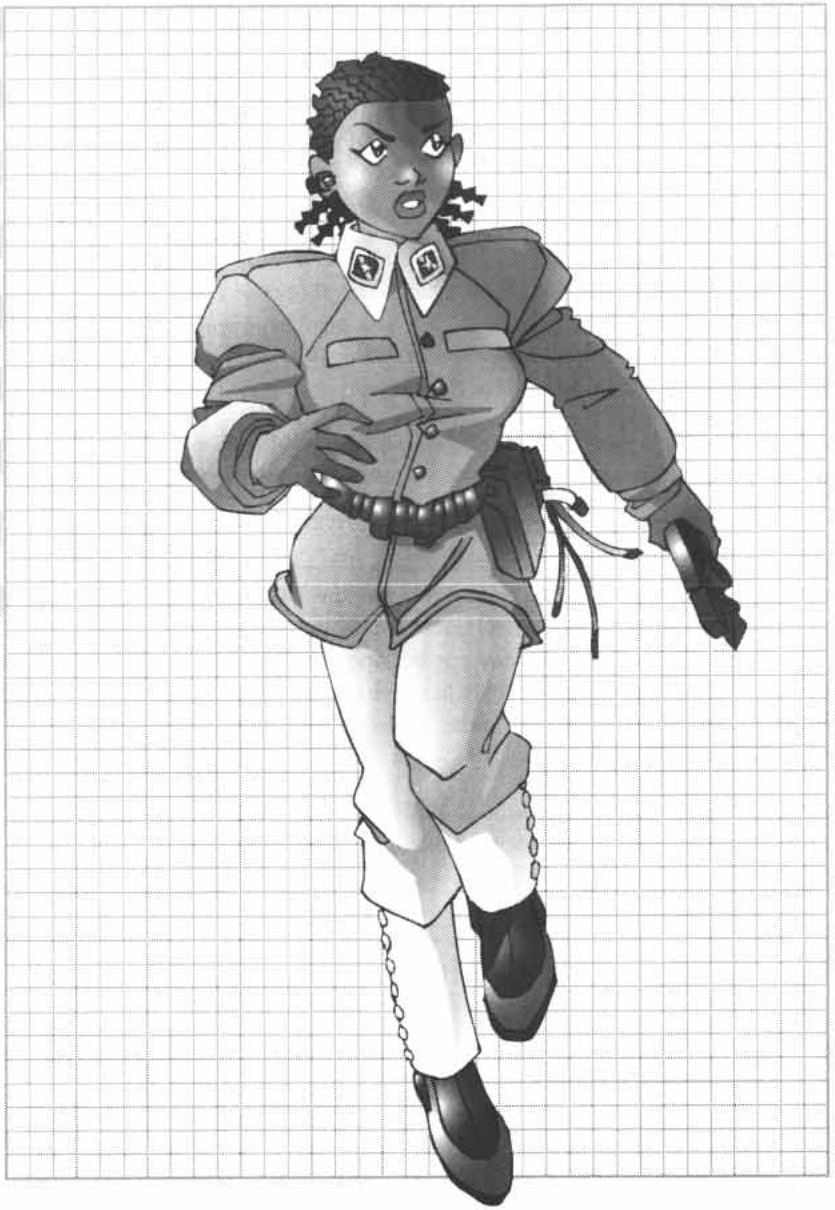
The combat portion of the wave strike now begins. The advancing force moves all units forward one hex in, and only in, the direction selected in the pre-engagement phase. They may not hold back or advance more, regardless of thrust expenditure.

Either side may then perform actions. A unit does not have to spend an action now; it can wait until it finds itself in a more advantageous position. All actions within a single battle phase are considered to be simultaneous. Effects, such as electronic warfare Thresholds or system damage, do not take effect until all units have completed their actions for this phase.

Damage may be determined as attacks are declared, but it does not take effect until the end of the phase, regardless of the damage inflicted.

After all actions have been resolved, the effects of the exchange are now applied. Damage should be recorded, and will now take effect. Once this is completed, a new battle phase begins. Units that have spent all their actions may not act again (unless they receive Command Points), but continue to move one hex in every phase, like all other units on their side. Likewise, damaged or destroyed vessels will do the same.

A wave strike continues cycling through battle phases until both sides have used all their actions or until all units have exited the playing area.



▼ 6.2.1 Bosun

Hard and constant work is required to keep a spaceship running. Bosuns constantly get lists of items needing maintenance or replacement from the bridge and quartermaster staff. This is all in addition to regularly scheduled activities. Organizing the work is important: not only will the bosun learn how to repair items but also how to find creative solutions, often in mid-flight. A good tour as a bosun makes one very marketable on the space lanes.

The following Archetype is built on 25 Character Points and 34 Skill Points.

Attributes

AGI	0	APP	0	BLD	+1	CRE	+1
FIT	+1	INF	0	KNO	+1	PER	0
PSY	0	WIL	+1	STR	+1	HEA	+1
STA	30	UD	5	AD	5		

Skills

Computer	1	Dodge	1	Electronic Design	1
Electronics	2	Mechanics	2	Notice	1
Physical Sciences	1	Security	1	Small Arms	1
Space Pilot	1	Survival Space	2	Tinker	1
Zero-G Mov.	2	Zero-G Combat	1		

Equipment

Spacesuit, Crew Belt, Extra Tether Cable, Computer with Scutter Control Program, Interface Cables, Large Wrench

Similar Archetype

Deck Hand, Engineer, Yard Worker, Space Racer Pit Crew

▼ 6.2.2 Marine Combat Engineer

Building and destroying are more than a science, they are an art form, or so the combat engineer credo says. Combat engineers perform these delicate tasks under fire without flinching or rushing the job. Due to this, they tend to develop very rugged personalities which allows them to keep a cool head at all times. They follow the ethic "work hard, play harder:" off-duty combat engineers use the opportunity to unleash the intense stress they face on the job.

The following Archetype is built on 28 Character Points and 39 Skill Points.

Attributes

AGI	+1	APP	0	BLD	0	CRE	+1
FIT	+1	INF	0	KNO	+1	PER	+1
PSY	0	WIL	+1	STR	0	HEA	+1
STA	30	UD	3	AD	3		

Skills

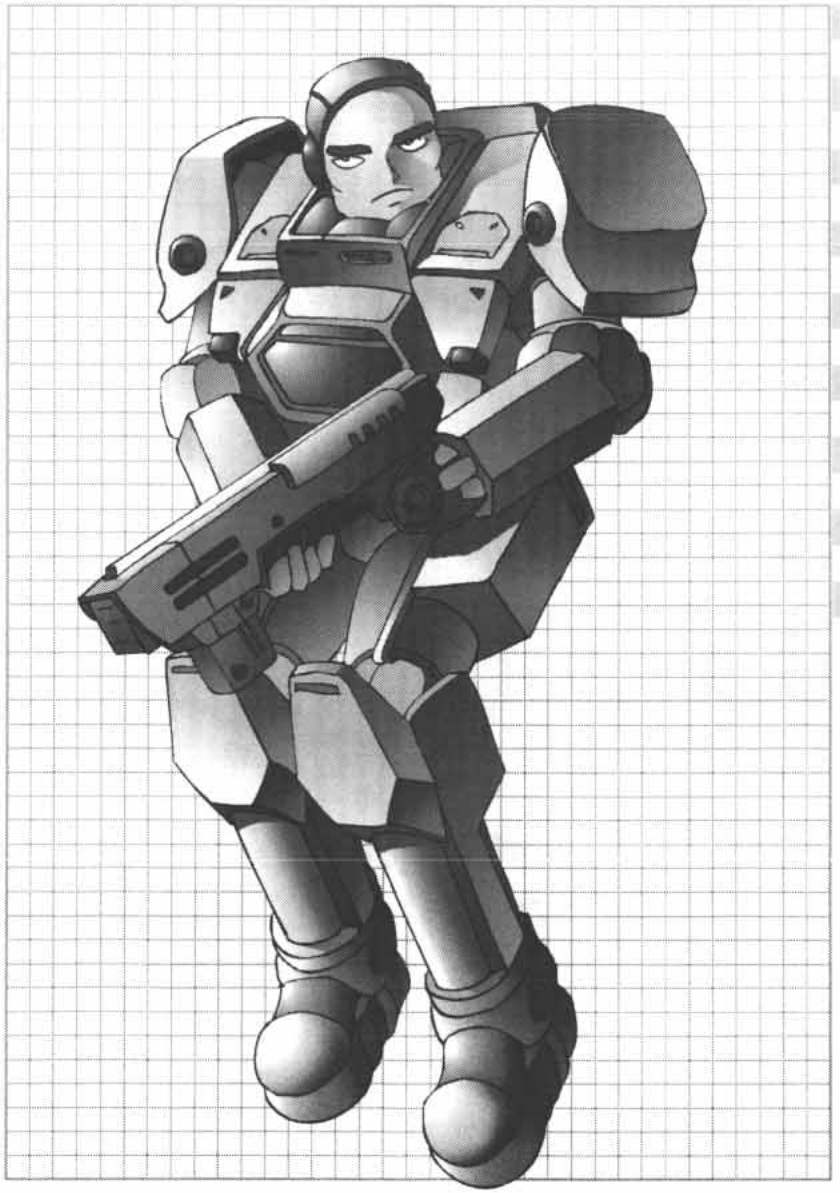
Combat Sense	1	Demolition	2	Dodge	2
Electronics	1	Mechanics	1	Physics	1
Security	2	Small Arms	2	Zero-G Mov.	2
Zero-G Combat	2				

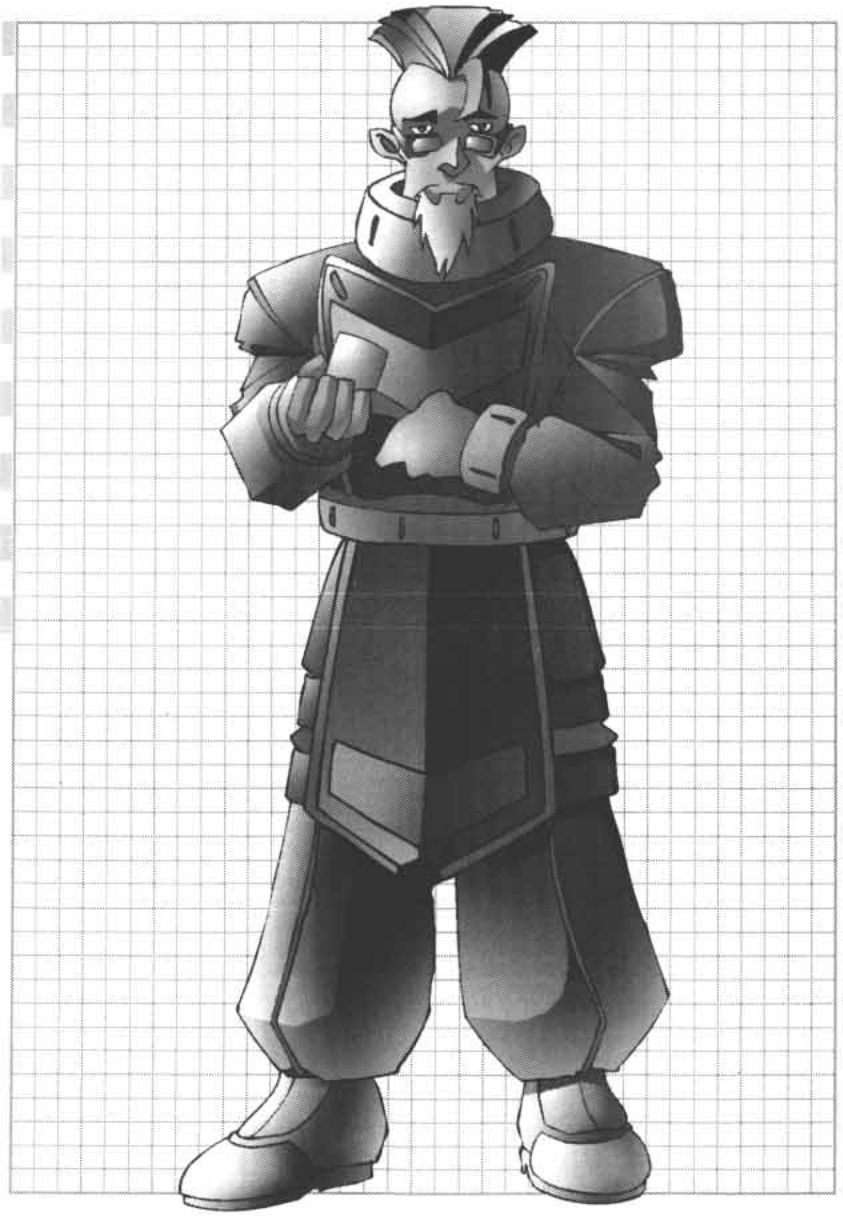
Equipment

Armored Herc Suit, Shotgun, Ammunition pouches, Tool Kit, Satchel Charge

Similar Archetype

Terrorist, Asteroid Miner, Bank Robber





▼ 6.2.3 Magistrate

Mankind's inner instincts unfortunately often overpower rational thought, and criminal activity still occurs throughout the solar system. The people responsible are often arrested by local authorities, but some smaller colonies must rely on the CEGA's protection instead. Magistrates provide a fair trial to determine the fate of those apprehended. There is an increasing occurrence of CEGA magistrates working in competition to sentence the same individuals as SolaPol, though in some cases, they do work closely with the USN's police force. It is often comes down to who catches the criminal first.

The following Archetype is built on 26 Character Points and 37 Skill Points.

Attributes

AGI	0	APP	0	BLD	0	CRE	0
FIT	0	INF	+1	KNO	+2	PER	+1
PSY	-1	WIL	+1	STR	0	HEA	0
STA	25	UD	3	AD	3		

Skills

Bureaucracy	2	Computer	1	Earth Sciences	1
Human Percep.	2	Intimidation	2	Notice	1
Law	2	Life Sciences	1	Physical Sciences	1

Equipment

Gavel, Office Robes, Computer, Court Room Recordings, Taser

Similar Archetype

Lawyer, Civilian Advisor, Corporate Mission Specialist

▼ 6.2.4 CEGA Infiltrator

Sending marines are a costly means of achieving an objective, so CEGA is in the process of placing loyal infiltrators over all major colonies. These can supply advance information, such as floor plans, so a marine strike can be better planned. They will also attempt to disable defenses before the marines get there. It is a dangerous task: by operating without uniforms, they are effectively spies and saboteurs. To cover up their efforts, many pretend to members of terrorist organizations such as STRIKE.

The following Archetype is built on 28 Character Points and 38 Skill Points.

Attributes

AGI	+1	APP	+1	BLD	0	CRE	0
FIT	+1	INF	+1	KNO	0	PER	+1
PSY	0	WIL	+1	STR	0	HEA	0
STA	25	UD	3	AD	3		

Skills

Communication	1	Computer	1	Dodge	2
Demolition	1	Etiquette	1	Hand to Hand	1
Interrogation	1	Investigation	1	Notice	2
Security	2	Seduction	1	Sleight of Hand	1
Small Arms	1	Stealth	2		

Equipment

Needler, Explosives, Break and Enter Kit, Maps

Similar Archetype

STRIKE observer, SolaPol Infiltrator, Corporate Saboteur

▶ 6.3 CAREER PATHS

The CEGA Navy has a total manpower of roughly three times that needed to operate her fleet and stations. Having decided to reduce the cost of their ships by avoiding rotating sections means having to increase the amount of personnel available for duty rotation. In turn, this makes the shipboard positions highly coveted. Competition to earn, or re-earn, a ship post ensures that potential crew keep an excellent record, or otherwise find ways of getting themselves noticed. Most cannot achieve this and are condemned to a low-ranking life.

Unofficial patron-pupil relationships exist to manipulate the system. Higher-ranking persons "sponsor" someone in lower rank. The patron will see that things fall in place for the pupil to receive the ship posts that lead to rapid promotion. In turn, the pupil will help the patron when called upon. It also leads to the growing influence of political groups within CEGA: a number of patrons receive support from wealthy sources.

Offending a powerful patron or their pupil can easily cut short a promising career. It is possible for admirals to specifically recommend that an offending captain be made a permanent instructor at a planetside academy. Such a posting will end the captain's spacegoing days, unless another patron is willing to protect him.

Personnel with family may forego trying to earn a shipboard position. There are many reasons for this, but being separated for years can break even strong relationships. It is said that to eliminate a competitive rival, get them a spouse.

Either spouse may be unable to cope with the Navy's life. CEGA provides programs to encourage mutual support, such as "Space Mothers" and "Fathers." These let the temporarily single parents look to each other for mutual support and safe socializing. The truly politically-minded use their spouse's participation in these groups to gather more influence toward their objectives.

There are still many opportunities for growth in the Navy without sailing on a spaceship. CEGA maintains resupply stations and training facilities, and provides personnel to research centers, not to mention the many orbital, Lagrange and planetside centers. On one hand, taking several of these "fixed" posts in a row will crush any chance of getting another shipboard post. On the other, the growth within these facilities can be quite rapid, as those filling the current positions are transferred out for ship duty.

Behind the large numbers in active service, a huge pool of reservist is available. Upon receiving an honorable discharge, persons can be called for emergency military service for up to five years afterward. A number of them voluntarily join the reserves during this time to receive training, be paid for the risk, or qualify for a better pension. Joining the reserves makes the individual available for full military duty, whether an emergency exist or not.

Since 2210, CEGA has been producing warships at an ever increasing rate. Budgetary limitations prevent the CEGA navy from matching the new posts created with equally balanced recruitment and training programs, and the overall ratio of ship board to fixed post is continually declining. Many are using this time to accelerate their careers.

Senior posts offer new opportunities to naval personnel. In many cases, however, reservists are being called upon to provide the necessary skills. This is normally to fill posts on older ships which they have already served on. Patrons' influence significantly affects any such posting.

The excesses in manpower exist to support a long term war. New personnel recruited, or conscripted, during a war will have little in the way of skills. Thus skills must be developed prior to engaging in a major conflict. Of all the space powers, CEGA currently has the best resources to weather the affects of mass casualties. If nothing else works, the CEGA Navy could succeed in winning a simple war of attrition.

▼ 6.3.1 Flag Officer

Those holding the rank of Commodore or above are referred to as Flag Officers. They command squadrons of warships or major installations. One of these ships, typically the largest, is chosen as their mobile headquarters. Here is where the officer's "flag" is located. All ships in the squadron look to the "flagship" for their directions.

In the event of damage, the officer may transfer his flag to another ship. In the event that the flag officer is killed, another squadron commander is immediately chosen. Emergency conditions dictate that the highest ranking officer with the most time on active space duty take command. Debates over who has more experience prevents this from being an easy transition. Normally, the Flag Officer will create a seniority list of the emergency commanders as a precautionary measure.

◇ Aptitudes

Their duties place them into highly political situations, being a Flag Officer requires having the ability to not only see but to shape the "big picture." In order to reach this rank, most will have proved successful in the tactical arena. Their ability to direct resources makes them powerful patrons, or enemies, for junior officers.

◇ Primary Duties

A Flag Officer transforms political decisions into tactical directives. For example if the situation calls for a restriction of trade to a colony committing human right violations a squadron is detached under a Flag Officer to attend the situation. It is the Flag Officer's duty to arrange the logistical support, gather his ships, train them, gather them at the colony and then begin a blockade. If combat ensues the Flag Officer will have briefed the ships on what formations to use, what level of firepower to use and what the primary tactical objectives are.

◫ Sample Career Chronology

Year 1:	Enlist in the CEGA Navy.
Year 2:	Enter officer training.
Year 3:	First assignment Corvette Watch Officer
Year 4:	Lagrange station supply officer
Year 5:	ADB command, defending Poseidon class.
Year 6-7:	Advanced training courses, such as navigation.
Year 8:	Retained as an instructor
Year 9:	Chief Gunnery officer on Hachiman
Year 10:	Aide to Exo-Armor R & D
Year 11:	Tengu Command
Year 12:	Deep Space Station Watch Officer
Year 13:	Deep Space Station Commander
Year 14:	Promotion to Commodore, commanding outgoing trade convoy
Year 15:	Commodore, commanding overall trade convoy for the sector

Commodore ranks tend to be temporary positions. Rear and Vice Admirals command large sections of CEGA's resources. The six fleets each have one Admiral, one Vice Admiral and one Rear Admiral moving with the fleet at all times. Additional Admiral ranks (including Vice, Rear and full) exist to oversee the immense administration, training, construction and supply resources necessary to maintain the CEGA navy.

▼ 6.3.2 Marine

Marines have been stationed aboard ships ever since someone tried to take over another raft by jumping onto it armed with a stick. Their presence on spaceships remains necessary even in this age of vector mechanics and maser rifles. In fact, the powerful warships are, the more likely a sabotage attempt against them will be attempted; it is up to the marines to protect them. Marines will continue their long and proud history so long as their ships are sailing.

Marines also perform ground tactical duties. The fact that these individuals closely parallel the troops found in the CEGA Army both in equipment and overall training is no coincidence, and in fact much of the marine equipment was developed in joint Army-Navy ventures. Many of the small arms used in space are adaptions of planetside weapons, fitted with additional recoil compensators and other necessary fittings.

◇ Aptitudes

Marines undergo vigorous fitness training to give them every possible edge in battle. Agility and good hand-eye coordination are a major asset and highly sought in recruits. Marines live and die in situations where fractions of a centimeter may mean the difference between the victor and the slain. Non-combat marine personnel will need other aptitudes; advanced schooling programs seek to teach these traits to those looking to develop solid trade skills.

◇ Primary Duties

Marines are the protectors of the ship and crew, and often its peacekeepers as well. While the ship is docked, they man the gangplanks being used to ensure that only authorized personnel come on board. At almost every CEGA port a ship lands on, at least some of the crew will be getting replaced. This is the main occasion when illegal substances are smuggled onto a warship.

◫ Sample Career Chronology

Year 1:	Enlist in CEGA Navy; go through boot camp and basic training.
Year 2:	Preselection tests. Admitted to Marine Ground and Space Academy.
Year 3:	First assignment: skyhook security, low Earth orbit.
Year 4:	Reassigned to naval construction yard security forces, L4.
Year 5:	Space duty onboard a corvette as marine squad member.
Year 6:	Custom duties on a deep space outpost in the Belt.
Year 7:	Recommended by old captain and admitted to Navy Exo-Suit Flight School.
Year 8:	Search and Rescue duties onboard a Birmingham-class attack carrier.
Year 9:	Promoted to Academy Drill Instructor post for exceptional service.
Year 10:	Promoted to Exo-Suit Platoon NCO on board a Constantinople-class marine Assault Vessel.

The other primary responsibility of the ship's marine force is the destruction of hostile space systems from within. Marines are trained to break into a ship, kill the crew and tear apart the insides — anything to take control of it, or, failing that, to render it inoperative as a combat vessel, preferably for a long time. A good marine squad can land, penetrate the outer defenses and sever a ship's power distribution network in minutes. This is also true of enemy forces, and thus marines are also needed to defend against a similar attack being attempted on their own ship.

▼ 6.3.3 Naval Yardhand

Thousands of different components make up a warship, and it is the yardhands at the many CEGA space docks that put everything into place. With each class of ship continuing to be built and redesigned over several years, many of these components are replaced with more advanced versions based on new advances in technology. Only the simplest mass-produced units will tend to be the same all the way through the production run, and even then minor improvements are often made along the way. Yardhands must thus continually learn new technologies and have the responsibility of implementing them.

While the construction yards are heavily guarded by military personnel, they are in fact civilian facilities, and as such the yardhands are considered to be contracted civilians, not military troops. They do share a few things with the soldiers, however, such as security clearances and knowledge of the operating procedures.

◇ Aptitudes

Yardhands need to be patient masters of precision. Too many failed components, and the military might refuse to accept the entire warship after the commissioning trials. They must be willing to spend hours doing minor chores such as welding, tightening nuts and pulling cables through the hull.

The worse possible result would be for a minor failure, such as chaffing on control cables, go unnoticed until the unit failed in the middle of a test or, even worse, a battle. Due to the dangers of space, most ships carry various alternative backups for critical systems, but even this is not a perfect safeguard.

◫ Sample Career Chronology

Year 1:	Graduate from technical college
Year 2:	Airstrip fuel operator
Year 3:	Shuttle mechanic
Year 4:	Senior shuttle mechanic
Year 5:	Hired on as bosun on merchant ship
Year 6:	Maintain merchant ship
Year 7:	Hired as yardhand building launches
Year 8:	Transferred to orbit to military construction yards

◇ Primary Duties

Work is done both in and out of zero-gee. Outside of zero gee fine detail work is done on items such as sensor arrays. Components are then transferred out to the hull in zero-gee for installation. Once installed another round of tests is done to ensure proper placement. If a component is redesigned part way through construction it may be necessary to tear out older units already installed and replace them with the new design.

Naval yards also perform major repairs. Assessing the spread of the damage is important. A tear in the outer hull may lead to bending in structural members as the ship thrusts back to port. Naval yards perform the major upgrades on the warships. Flag officers must carefully plan how often their ships will be out of action for upgrading.

▼ 6.3.4 Bosun

While yardhands build the ships, it is the bosuns and engineers who maintain them. On major vessels, the task of maintaining the engines is given over to the engineers, and all other systems to the bosuns. On smaller ships the handful of engineers must perform both tasks.

◇ Aptitudes

Bosuns need to become masters of all of the ship's components. The ability to handle major repairs, keep up maintenance schedules and do much of this in a spacesuit takes years to develop, and this knowledge is in high demand in the civilian market. CEGA actually has a problem in retaining good bosuns at the end of their tours of duty.

◇ Primary Duties

Bosuns receive lists of work to be done each time they go on shift. The items listed range from regularly maintenance schedules to a message from a sensor specialist that an antenna motor is sluggish to special tasks direct from the captain. The total maintenance time for a hull is fulfilled by a combination of man-hours from specialists testing their equipment and the bosuns making actual repairs.

Due to their wide access throughout the ship, bosuns are frequently involved with on board smuggling rings. In exchange for a portion of the profits, a Bosun can hide illicit substances and other items in a hard-to-reach area of the vessel. Such items are generally banned recreational products, such as certain unpatriotic video cards, but also includes mind-altering drugs that tune out the boredom of space travel.

◻ Sample Career Chronology

Year 1:	Enlist in CEGA
Year 2:	Bosun training at LaGrange point facility
Year 3:	Assigned to space station maintenance
Year 4:	Assigned to an ADB
Year 5:	Deep space station duty
Year 6:	Duty on board a Hachiman
Year 7:	Instructor at LaGrange point facility
Year 8:	Last year in standard bosun six year tour of duty. Assigned to Poseidon-class Battleship.

▼ 6.3.5 Pilot

Carried craft may be able to go from point A to point B by themselves, but their autopilots have very little ability to adapt to changes. Combat is also far beyond computer systems, or at least legal systems that do not breach the Edicts. Pilots are thus needed to operate carried craft onboard a space ship. The term can also refer to the helmsman on a warship.

◇ Aptitudes

Pilots need to be capable of rapidly making independent decisions. This often means that they have a bold streak that may appear as a roguish or rebellious attitude when compared to other ship crew. To be trusted with a multi-million credit craft, however, pilots must still show the ability to follow orders.

Physical requirements vary according to the type of craft being operated. Exo-armors require excellent motor reflexes to control the unit's limbs. Pilots of shuttles, launches or warships need to be more creative to understand different ways of achieving changes to their vector profiles. Armed craft also require the pilots to have good eyes. Even in these days of scanners and jammers, a good eye will give a pilot a few seconds' advance notice over someone with a more usual level of perception.

◇ Primary Duties

As the name implies, pilots control their craft during flight. Outside of flight, the craft really belongs to the maintenance crew, though pilots often insist to help in evaluating the performance of the craft and repairing it. Sometimes, the deck hands find this more a nuisance than an help. Pilots realize that a failure in flight could mean not only the loss of the craft but of their own lives, and will continue to check on the ground crews out of professional necessity — regardless of what they think about it.

◫ Sample Career Chronology

Year 1:	Enlist in CEGA
Year 2:	Officer Training
Year 3:	Pilot Candidacy Program
Year 4:	Assigned to assist construction at a naval yard
Year 5:	Space Combat Training
Year 6:	Assigned to a Syreen on orbital defense
Year 7:	Advanced Tactical Courses
Year 8:	Assigned to Tengu performing convoy escort. Trained in Wvyern operations
Year 9:	Flight leader in charge of deep space station defense duty
Year 10:	Assigned to Tengu performing Combat Area Patrols (CAP) for the fleet
Year 11:	Cerberus training and assignment to Birmingham-class attack carrier.

▼ 6.3.6 Magistrate

CEGA's plan for expansion into space consists of acquiring numerous ports capable as serving as military bases for operations in later years. Pursuing claims of criminal acts, the marines have been apprehending leaders and dissidents left and right. The justice department on the Constantinople-class conduct trials and carry out many sentences. Magistrates are present to apply CEGA laws and keep these ports under control. In a number of cases, CEGA has declared the annexation of these ports so that these laws will be enforced above the colonies' local laws. Magistrates are typically civilian law officials who receive an officer's commission to perform their duties.

◇ Aptitudes

Several years of experience with CEGA laws is mandatory for the job. Due to the breadth of cases brought to them, most Magistrates have developed a basic understanding of many sciences. This learned wisdom, and the required dignity of their task, gives them an air of authority. Few threats ever impact their decisions; they have already placed the worst individuals of the solar system behind bars, and the anger of one more changes their lives very little.

◇ Primary Duties

Judges see the true scum of the solar system before them. These are people so vile as to make it necessary to fight a battle both with warships and with ground troops.

Sometimes, however, amid all the true war criminals, soldiers following orders, civilians forced into crimes due to starvation and fear, and those seeking to gain back property lost during the conflict are sometimes brought before them. These cases need to be viewed with sympathy, for it is for the judge to decide who is to oppressed and who is to be supported.

◫ Sample Career Chronology

Year 1:	Graduate from CEGA approved law school
Year 2:	Internship
Year 3:	Approved by the CEGA Legal Bar.
Year 4-8:	Junior legal partner in earth based law firm
Year 9:	Brought to the attention of the CEGA Naval Legal Services. Under extensive legal and political review.
Year 10:	CEGA Naval Justice Academy
Year 11:	CEGA Naval Justice Academy, Space Habitation Training
Year 12:	Commissioned as Ensign. Assigned as Judge aboard CEGA deep space station.
Year 13:	Judge aboard CEGA deep space station
Year 14:	Judge aboard Constantinople-class warship.

▼ 6.3.7 Administrator

Huge volumes of information control and monitor the flow of CEGA personnel and equipment. Everything from how much radiation a bosun orbiting Venus has taken during a space walk to the last time the plumbing of shower #2 on ADB-23 was replaced, everything must be kept track of. Administrators record and analyze this information to determine trends. They have significant effects on battles by tallying what resources have been used by the ships for the months previous to the engagement and what remains available to fight with.

◇ Aptitudes

Administrators must come to respect the information in their hands. A confusion in logistics can leave a warship stuck in port, or worse. In turn, the fleet it is a part of will be made more vulnerable by its absence. Overall requirements are much lower for administrators: often the personnel with physical degradation due to zero-gee exposure will find their way into an administrative duty. The advantage of this is that they often have relevant field experience to what they are helping to manage.

◇ Primary Duties

Administrators ensure that proper record keeping is taking place. While they receive reports from navy personnel, they sometimes also call for verification of information. Administrators may refuse to process an issue if important information is missing, and have developed a (sometimes deserved) reputation for being hard to deal with bureaucrats.

Due to the volumes of data they receive, they must often prioritize it and decide what gets done first. Some have been known to tamper with this list in order to favor a friendly officer or punish one who has refused a request.

◫ Sample Career Chronology

Year 1:	Enlist in CEGA navy
Year 2:	Sensor specialist training
Year 3:	Orbital traffic system support
Year 4:	Assigned to a Tengu escort carrier
Year 5:	Wounded in action. Recovery on Earth.
Year 6:	Assigned as administrator overseeing carrier supply shipments
Year 7:	Supervisor of fleet sensor system administration

▶ 6.4 ONBOARD EQUIPMENT

Life inside a ship requires much more than just guns and life support. Crews make use of a host of handheld items to perform their functions. A complete list of equipment is too massive to list in one location, but it is possible to give highlights and game statistics for a few major items.

Useful items will generally be produced by two or more competitive manufacturers. Thus, most items listed here have similar versions in use on some ships in the civilian sector. In fact, the onboard equipment used by one space power likely has a counterpart in another. Gamemasters may simply change the names of the items (and perhaps modify their stats slightly) to provide the Jovian Fleet with a launch. Items listed in other fleet books are also likely to have counterparts in the CEGA Navy.

Tool kits of many types are commonplace onboard spaceships. These are needed to conduct repairs or perform maintenance. Ship electronics have been designed to be tested by fairly standard hardware systems: a technician takes a portable computer with a specialized software test program and connects it to the equipment. The machine then performs the appropriate test for that piece of electronics. Sometimes, more specialized hardware will be needed and will be stored in one of the ship's workbays.

While the standard crew belt has the capacity to hold a side arm, the carrying of weapons aboard ships is restricted. Officers are always permitted to carry a sidearm and a melee weapon. The most common melee weapon is a saber. Despite its bulk, the saber gives an immediate air of authority. A saber's slashing style can rend long tears in spacesuits that are beyond patching.

Enlisted personnel will only carry a sidearm during a boarding action, or if one is likely to occur (in battle, for example). Marines are allowed to carry a sidearm at all times to provide immediate response to danger. Heavier weapons are used when on duty or during combat.

▼ 6.4.1 Crew Belt

The crew belt is a standard issue device for all CEGA naval personnel. The belt includes a number of devices: a maneuver rod (2 MP, 4 BP) for powered movements; a five-meter tether cable with a quicklock clasp, used to secure the wearer against sudden decompression; and two "slap patches." There is an attachment point for a standard sidearm on both sides.

A small radio system is also standard: those using it frequently typically run the wire to the hands-free commset underneath their uniform. The radio is only a short range system, intended for use inside a spaceship or near it (Comm -3, range 2 km).

Several types of pouches can be secured to the belt itself. Some are just cloth carry bags, but a selection of tool kits is also available. Every belt comes with one shielded pouch that is used to safely carry mem-cards.

Mass:	0.5 kg	**Price:**	500 Cr

▼ 6.4.2 Series-B Type 69 Escape Pod

This unit typifies the two-person escape vehicle used onboard CEGA warships. Conditions are very cramped. Each occupant sits in a different orientation than the other, effectively making them wrap themselves around each other. The small size of the pod reduces the amount of ship volume needed and the amount of hull surface area that must be used for launch ports.

These pods can sustain two persons for roughly forty-eight hours (for a total of 96 man-hours). Onboard equipment include a first aid kit, automatic distress beacon, food bars, water bottles and excretion bags for hygiene purposes. Escape pods are designed to dock with lifeboats like the 16-man Dunkirk III. A heat shield and parachute make atmospheric re-entry possible, though extremely bumpy and uncomfortable.

▼ 6.4.3 Scutter

A good scutter is a bosun's best friend. A scutter is a small unit used to conduct repairs in hard-to-reach places. The small drones are equipped with both built-in and add-on tools; in many ways, they are similar to, but smaller than M-Bots. They look like eight-legged crawling machines with an "eyeball" computer and two arms in front. Scutters can climb up and down the ship's piping looking for faults.

Scutters normally follow patrol patterns within the ship's systems. Occasionally a unit gets lost and needs to be dug out. This can be due to changes in the ships internal layout since the unit was programmed or security alerts closing doors the scutter was planning to use. At a cost of less than 1000 credits apeice, scutters are sometimes left alone if trapped in difficult to reach places.

If desired it is possible to operate a scutter by remote control. There small size and low cost make them useful to perform dangerous repairs, such as a damage plasma vent. More than once a scutter has climbed inside, been used to repair the damage and then sealed the hole from the inside. During overalls a ship may have dozens of scutters pulled out from different areas. Many times they simply need to be recharged to be used again.

Game Stats:

Crew: 0Armor 5/1/15 (Personal Scale)Size 0.2 (15 kg)
Move: Walker 0/1 (3/6 kph)Maneuver: +1DR: 100 km
Sensors: -1/1 km Comm: -1/2 km FC: 0
Perks: Autopilot, Manipulator R1 (can punch), Tool Arm R1 (cannot punch), HEP: Extreme Heat, Vacuum, Radiation 3, Computer CRE -2 KNO 0 PP 2
Flaws: Annoyance (sometimes gets lost), Exposed Auxiliary Systems, Exposed Movement System.

▼ 6.4.4 CESS MK XII Spacesuit

The twelfth model of the CEGA Emergency Space Suit, or CESS, is known for its reliability and ease of use. Suits are stored inside cabins, near battle stations, along hallways and inside escape pods. Like most emergency suits, the CESS is designed to fit almost everyone, though smaller versions of the suit exist and are needed for very young children.

The outer layer of the suit is reflective to reject heat and to make the suit easy to spot during rescue operations. The inner layer is made up of a rubber-like substance that acts as an insulator. The piping for the life support runs through this layer. Between the two, an advanced polymer that is extremely difficult to tear serves as the main pressure vessel. Like most emergency suits, the hands are protected by mittens to avoid issues with finger sizes.

Each suit carries a 30-minute air supply. A simple connection port allows the suit to be plugged into the life support system of all standard escape pods and lifeboats. Emergency stores consist of a can of dual spray (see **Ships of the Jovian Confederation Volume 1**, page 138), a maneuver rod, a tether line and an emergency patch. The shoulder areas have internal reinforcing to be used as grabbing point during rescue attempts. A flashing light may be activated to get the attention of rescue parties or deactivated to conserve battery power.

The number of 6-second combat rounds needed to get into a survival suit is equal to 5 minus the result of a Survival: Space Skill test. A minimum of one round is always required. A Fumble wastes an additional 1d6 turns. Due to the rough articulations, any physical action is at -2 while wearing the suit.

Mass	2 kg	**Price**	2000 Cr

▼ 6.4.5 Satchel Charges

The concept of carrying around a bundle of wrapped explosives to demolish enemy resources has been around for centuries. CEGA marines use satchel charges to open obstacles or sever critical systems in an enemy ship. In tactical combat, it takes one action to make a satchel attack. In roleplaying situation, it takes 1d6 turns, minus the user's Demolition Skill, (minimum of one turn) to properly place the charge. Attacks with placed charges have an effective Damage Multiplier of x15 (Vehicle Scale). Attacks are made using the Demolition Skill. Only specialized squads, such as marine engineers, have this Skill at level 2. Each satchel charge adds 15 to the TV of the carrying infantry squad.

Attacks against moving targets are possible if the charge is thrown. When the squad is making a satchel charge attack, it is exposing itself to enemy fire, out in the open. During that turn, the usual -2 modifier for shooting at infantry targets is ignored and the squad takes double damage from area affect weapons. Satchel attacks are automatically aimed at the Movement system of a vehicle, without the usual -1 modifier.

Mass:	3 kg	Price:	1500 Cr

▼ 6.4.6 Golden Space Cage

After decades of being in space, Mankind began taking parts of Earth along with him. The psychological impact of having some other living thing aboard is tremendous; CEGA even has courses to train both pet and owner to care for an animal in space.

Popular types of mobile pets include koala bears, monkeys, orangutans and sloths. The main requirement for a mobile space pet is the ability to move in zero-gee. Smaller animals lacking the necessary coordination must stay within the confines of their pressurized cage. This includes hamsters, small birds and lizards. Size and cost of the cages depend on the animal to be housed.

Much of the needs for care center around a space cage. This item is a small life support container adapted for use by animals. Mobile animals are trained to enter the cage in an emergency and to use the cage as a litter; an automated system inside collects the waste and treats them to avoid odors and hygiene problems. The more sophisticated cages can even separate and recycle the water in the wastes, returning them to the cage's food and water supply reserves.

CEGA does limit the number of pets allowed on board each individual ship. Since the decision is usually left to the captain's discretion, however, many officers can afford to own pets without any problem, unlike the enlisted men. Most pet owners will allow others to assist in the animals care, though, so in the end it matters little.

To avoid issues of jealousy or distractions, most ships have an official mascot position on the crew roster to account for one pet that will be shared by all. The tradition of having mascots is very strong, and a captain would be facing great unrest should the official mascot be ordered off the ship.

Statistics for pets varies according to type. Most will have a very low BLD but a high AGI and FIT. Animals generally don't have Skills beyond Notice, Dodge and perhaps one or two more. Their intelligence is too low to register on the human game stats scale, but they should still be give an intelligence attribute in case they have to perform a task (pressing the airlock button, for example).

All species of space pets have either been selected or bred to be docile. They will invariably stay out of any combat, and will attempt to flee if threatened. Most animals have better perception than humans: the sight of the mascot fleeing for the safety of its pressurized cage usually spell trouble.

Mass:	1 to 10 kg	Price:	2000 to 10,000 Cr

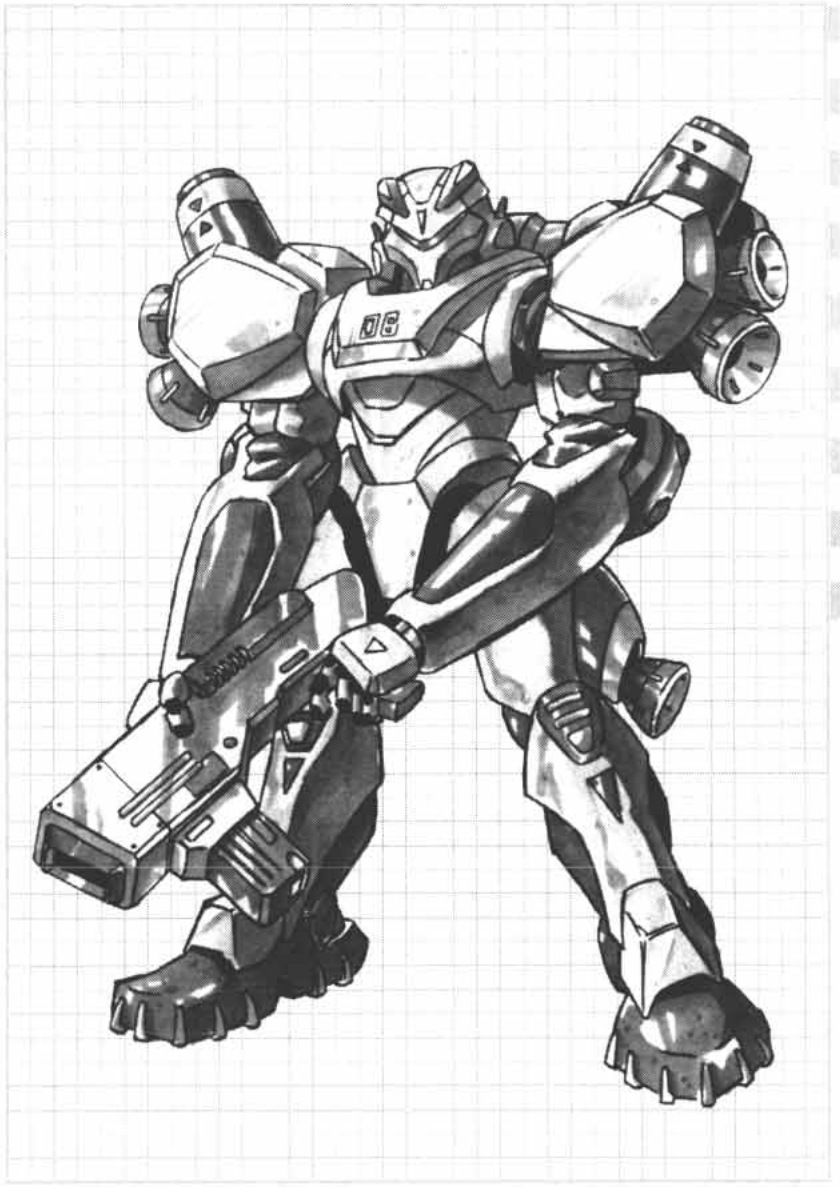
▼ 6.4.7 Kobalt Exo-Suit

Developed in a joint program by the CEGA Army and Navy, the Kobalt exo-suit's primary role is the destruction of enemy infantry. Its small size allows it to enter houses, tunnels and rooms that the larger Minotaur could never enter. The dual nature of the development has led to some surprising crossover benefits.

The Army required the unit to be able to operate in water. The Navy thus found a new route into a colony cylinder: the networks of sewers, hydroponic gardens and water treatment centers. Conversely, the Navy's need for thrusters makes the Kobalt extremely versatile in ground combat. Using short jumps, Army exo-suit troopers can bypass most physical obstacle or even operate as a slow VTOL unit. The Kobalt comes with a large backpack storage compartment for spare parts, ammunition and other supplies.

Game Statistics:

TV:	280	OTV:	290	DTV:	160	MTV:	380
Crew 1Actions: 2Armor: 6Size: 2							
Move: Ground 4/7, Space 6/11 Maneuver: 0DR: 250 km BP: 100							
Production: Mass ProdCost: 490,000Ind. Lemon: 3							
Sensor: 0/2km Comm: 0/10km FireCon: 0							
Perks: Backup Life Support, Backup FireCon, HEP: Underwater, HEP: Vacuum, HEP: Radiation R3, Life Support: Limited, 2 x Manipulator R2 (can punch), Searchlight (100m Fixed), Cargo Bay 1m^3							
Flaws: none.							
Maser Rifle: (F, Acc0, DMx5, BR2, Ammo30, WC111, AC0.2, MS2, Special: HEAT, AI, Sniper)							
2x Grenade Bundles:(FF, Acc0, DMx6, BR3, Ammo-, WC54, AC-, MS2, Special: SD, AI, AE1)							
Hummer Hatchet:(F, Acc0, DMx6, Melee, Ammo-, WC54, AC-, MS2, Special: AC, UW)							
Plasma Faust: (F, DMx15, BR1, Ammo-, WC45, AC-, MS2, Special: SD, HEAT)							



▼ 6.4.8 Landing Cutter

Marine Assault Vessels often travel with two landing cutters docked on their hull. Although an assault could be done entirely by exo-suits and boarding pods, it is not always appropriate to scatter the marines so much. The landing cutter can dive in, drop a mass of troops in one location, and if needed fly them all out again. These cutters are one of the few large military craft designed to both enter and leave planetary surfaces. A large cargo bay can be converted into passenger seating or be used as a mobile base.

The cutters are equipped with a counter battery radar, which the marines can use to identify the location of enemy artillery units. The landing cutter may then fire back with its missiles, direct a marine counter-attack, or call for a fire mission from an orbiting warship.

Game statistics:

TV:	10000	OTV: 17000	DTV: 1100	MTV:	13000
Crew:	4	Actions: 4	Armor: 40	Size:	16
Move: Flight 10/20 (St.0), Space 10/20 Man.: -2 DR: 2000 km BP: 2000					
Production: Limited ProdCost: 28,000,000Ind Lemon: 2					
Sensor: 0/4km Comm: +1/10km FireCon: 0					
Perks: Cargo Bay, 6000m³, Reentry System (Permanent), Counter Battery Sensor R4, Ejection System (4), ECM R4, 2xECCM R1, Backup Systems, All, Sickbay R1, HEP: All, HEP: Radiation R3, Large Doors, Tool Arm R9 (cannot punch), NOE Flyer, Stratospheric Flight					
Flaws: none.					
2xLaser Cannon (Rt/Lf, Acc0, DMx15, BR5, Ammo-, WC625, AC-, MS8, Special: HEAT)					
2xGatling Laser (Rt/Lf, Acc0, DMx5, BR2, Ammo-, ROF2, WC563, AC-, MS9, Special: AI, AM)					
Missile Bank (T, Acc0, DMx20, BR4, Ammo16, ROF4, WC2736, AC5.6, MS11, Special: Mis, IF, Seek1)					

▼ 6.4.9 Launch

Like the rumble buggies, launches are low cost vehicles fulfilling a niche in the needs of the space navies. While shuttles can carry large amounts of cargo and personnel, there are many times when only a handful of people need to be moved.

The launch is a small box-like spacecraft, like a flying minivan with no wheels. Thruster clusters on the outside of the ship face in all directions, giving an average maneuverability and acceleration to the vehicle. Chemical propulsion technology is used, since the launch is too small to carry a fusion power plant. These also reduce the chances of damage to what the launch is docking to.

The pilot's position takes up the right side of the forward hull. An airlock occupies the left side, so the pilot has a clear view of what he is docking to. Several viewports are placed along the sides for the six passengers to see out of. The passengers sit at the rear, with the pilot just in front of them.

During long flights, launches fly between ships, moving crew, supplies and other products. Passenger seating may be removed for cargo space (adding five cubic meters of cargo space for every passenger seat removed). The launch has no escape pod, but emergency space suits are stored inside the ceiling panels.

Game Statistics:

TV:	95	OTV:	0	DTV:	26	MTV:	260		
Crew	1	Actions:	2	Armor:	4	Size:	4		
Move:Space 3/6		Maneuver:	-2	DR:	200 hrs	BP:	200		
Production: Mass ProdCost: 60,000Ind. Lemon: 3									
Sensor: -1/2km		Comm: -1/10km		FireCon: 0					
Perks: Autopilot, HEP: Radiation R2, HEP: Vacuum, Passenger Seating (6), Limited Life Support.									
Flaws: none.									
Weapons: none.									

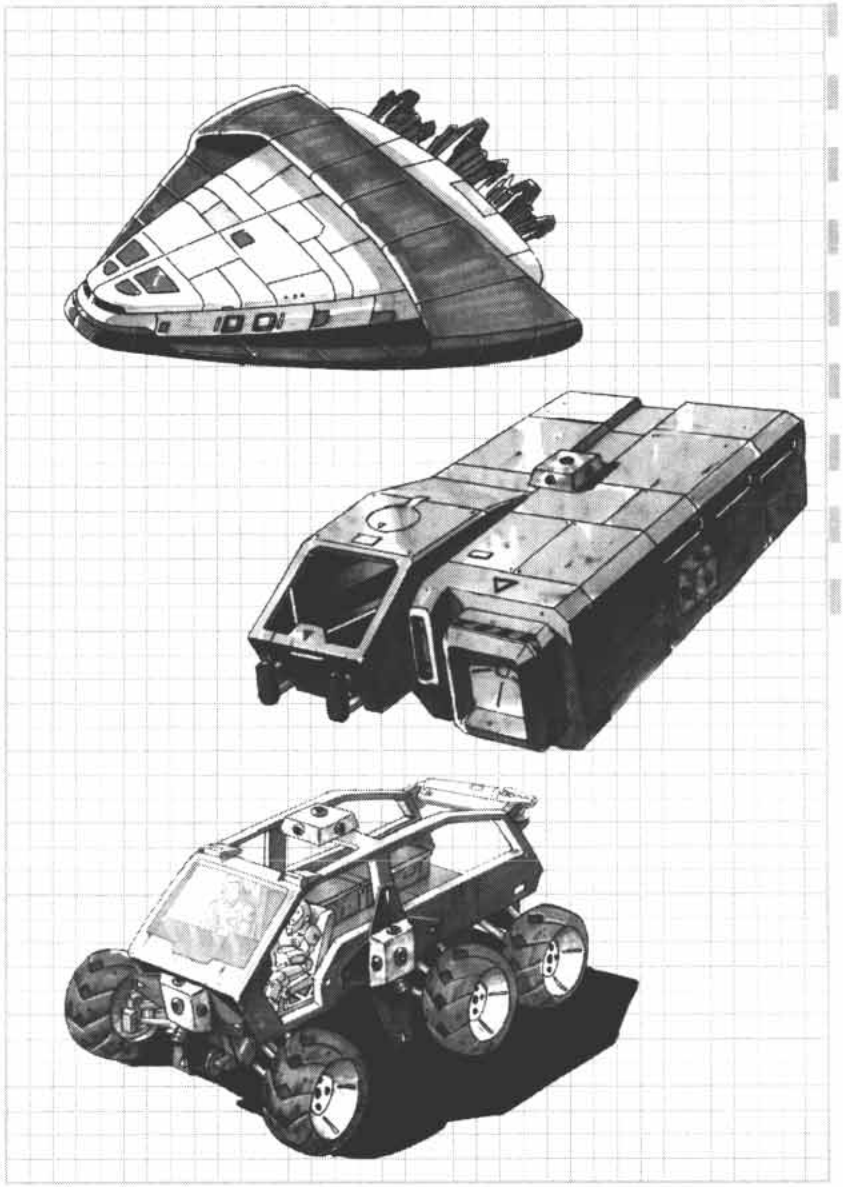
▼ 6.4.10 Rumble Buggy

Affectionately known as "rumble buggies," these all-purpose vehicles are the jeeps of space. Their ancestors were the lunar rover vehicles taken along the first moon missions. They have grown into low-cost vehicles that can be best described as a pickup truck with thrusters. Many companies produce slightly different versions, no two equipped exactly the same. Constantinople-class marine assault vessels carry over twenty of these vehicles for use inside a captured station.

The standard and most common rumble buggy is fitted with a powerful winch at the front and a robot crane arm to load items at the rear. With these, a skilled operator can handle practically any type of cargo that can fit the rear deck of the vehicle. If the buggy should get stuck somewhere, the winch and its cable are strong enough to pull it out. Another option is to use the space transfer thrusters to make the vehicle jump. Various racing sports make use of the jumping ability of this type of trucks in off-road races (often illegally), though sport racer versions commonly provide an enclosed cabin to protect the driver.

Game statistics:

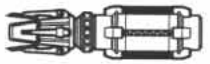
TV:	28	OTV:	5	DTV:	30	MTV:	48
Crew:	1	Actions:	2	Armor:	3	Size:	3
Move: Ground 5/10, Space 3/6				Maneuver: -2		DR: 300 km	BP: 100
Production: Mass Prod		Cost: 14,000		Ind Lemon: 3			
Sensors: N/A	Comm: N/A		Fire Con: -3				
Perks: Cargo Bay 6m² (open), High Towing Capacity (double), Improved Offroad, HEP Vacuum, Pintle Mount, Tool Arm R3 (crane; cannot punch)							
Flaws: Exposed Crew Compartment, No Sensors, No Communication							
Weapon: Winch (FF, Acc0, DMx3, Melee, Ammo-, WC9, AC-, MS1, Special: Winch)							



▶ SPACE SHIP MODULES

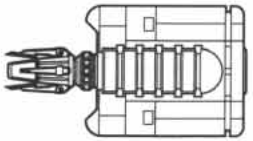
▼ Drive Sections

Tender Engine Cluster



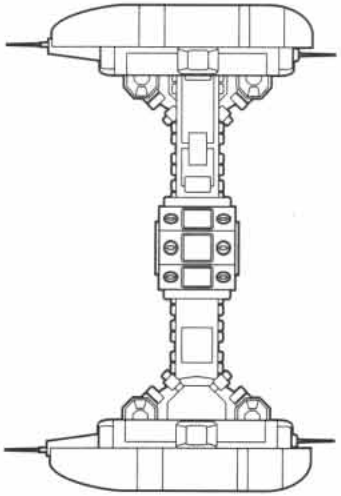
Quadruple Military Engine Cluster with Long Fins

Quadruple Military Engine Cluster with Short Fins

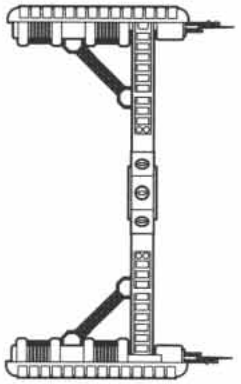


▼ Habitat Ring Sections

JAF2212 Cargo Rack



JAF2197 Cargo Rack

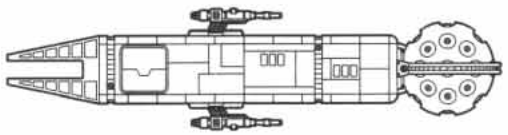


Customizing Space Ships

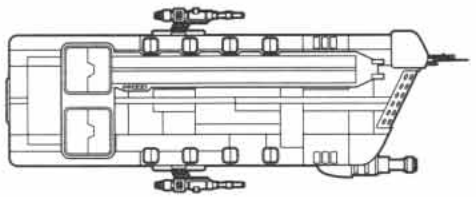
The above diagrams show all the modules that were used to build the ship classes found in this book. You can photocopy and cut out these sections to create your own space ship design, or just customize an existing hull.

Forward Hull Sections

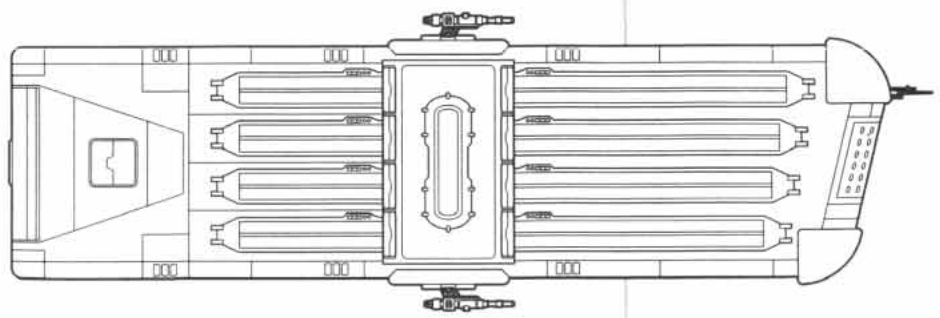
JAF2197 Cargo Rack



JAF2197 Cargo Rack

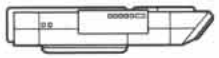


JAF2197 Cargo Rack



Forward Hull Sections

JAF2197 Cargo Rack



JAF2197 Cargo Rack

JAF2197 Cargo Rack

APPENDIX

Ships of the Jovian Confederation, V1 Errata

1) Prins Cannon Spinal Railgun

This was a missing weapon on the Forge Carrier. The Forges are fitted with two Prins Cannon, linked.

Fixed Forward, DM x45, BR 10, Acc. -2, ROF 0, Ammo 120, Special: Power Hungry 3, AP

MS 13, WC 2640, AC 17

2) Deployment Statistics

	Time	Volume	Mass
Alexander	3,000	30,000	6,000
Forge	3,000	51,600	10,300
Yuri Gagarin	3,000	100,500	20,100