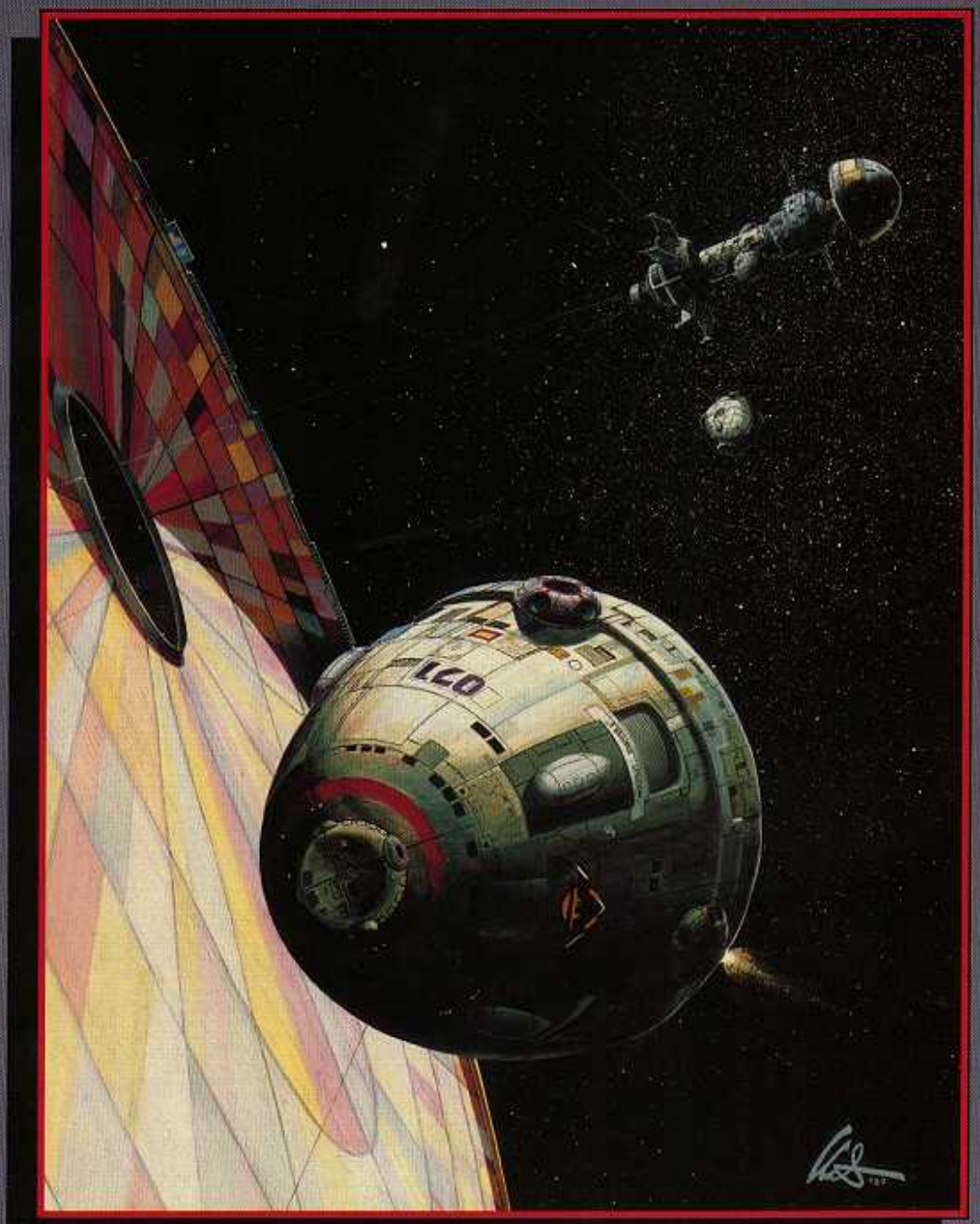
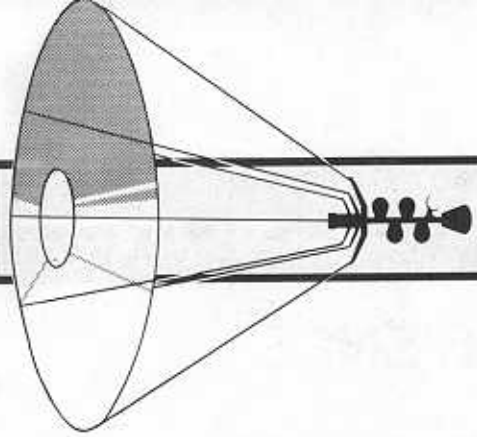
DROPSHIPS AND JUMPSHIPS™



Space Vehicle Design



DROPSHIP DESIGN

There are approximately 100 different DropShip designs throughout Inner Sphere. These designs range from small military assault ships to gargantuan civilian cargo vessels, and from small passenger liners to large troop transports.

Although these designs vary, they can be grouped into two construction categories. The first category, called aerodynes, consists of all DropShips that use aerodynamic lift to maintain altitude. The second category, called spheroids, consists of all DropShips that maintain altitude by using vectored thrust.

Aerodynes rely on aerodynamic design to maintain altitude in an atmosphere. Winged, aircraft-like constructions, these ships are generally smaller and more maneuverable than spheroids. Their specialized hull structures make them incredibly graceful while in atmosphere. However, this design limits these vessels' space transit capabilities, and most such vessels can rarely exceed 1G of acceleration for sustained periods of time. In combat, high-thrust maneuvering, and atmosphenic flight, the ship uses a separate maneuver drive system. While these systems are usually not oriented for use at long-range, they can provide acceleration of 3 Gs or more for several hours.

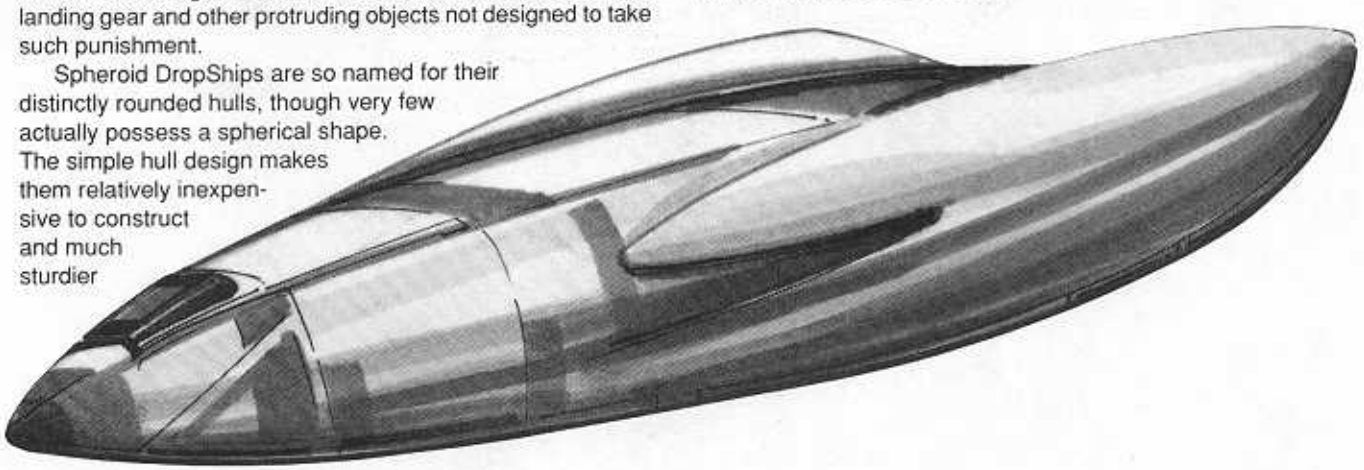
A disadvantage of the aerodynes is that most cannot land vertically; instead, like conventional aircraft, they must land on a long, flat stretch of runway. Therefore, these vessels are much less versatile than spheroids. They cannot use their interplanetary transit drives to hover like spheroids because, if the drives on the back of the vessel are pointed toward a planets surface, the super-heated air that circulates near the drive exhaust would rise up into the body of the vessel, scorching the wings. This heat build-up can overload cooling systems in minutes. The problem becomes even more severe when the ship is on or near the ground. At this altitude, any use of the transit drives causes a large back-blast of super-hot plasma, which can damage the skin of the ship and destroy extended landing gear and other protruding objects not designed to take such punishment.

Spheroid DropShips are so named for their distinctly rounded hulls, though very few actually possess a spherical shape. The simple hull design makes them relatively inexpensive to construct and much sturdier than their aircraft-like cousins. Thus, spheroids can be constructed in much larger sizes than can aerodynes. The largest of these, the Behemoth, masses 100,000 tons, many times larger than the largest aerodyne.

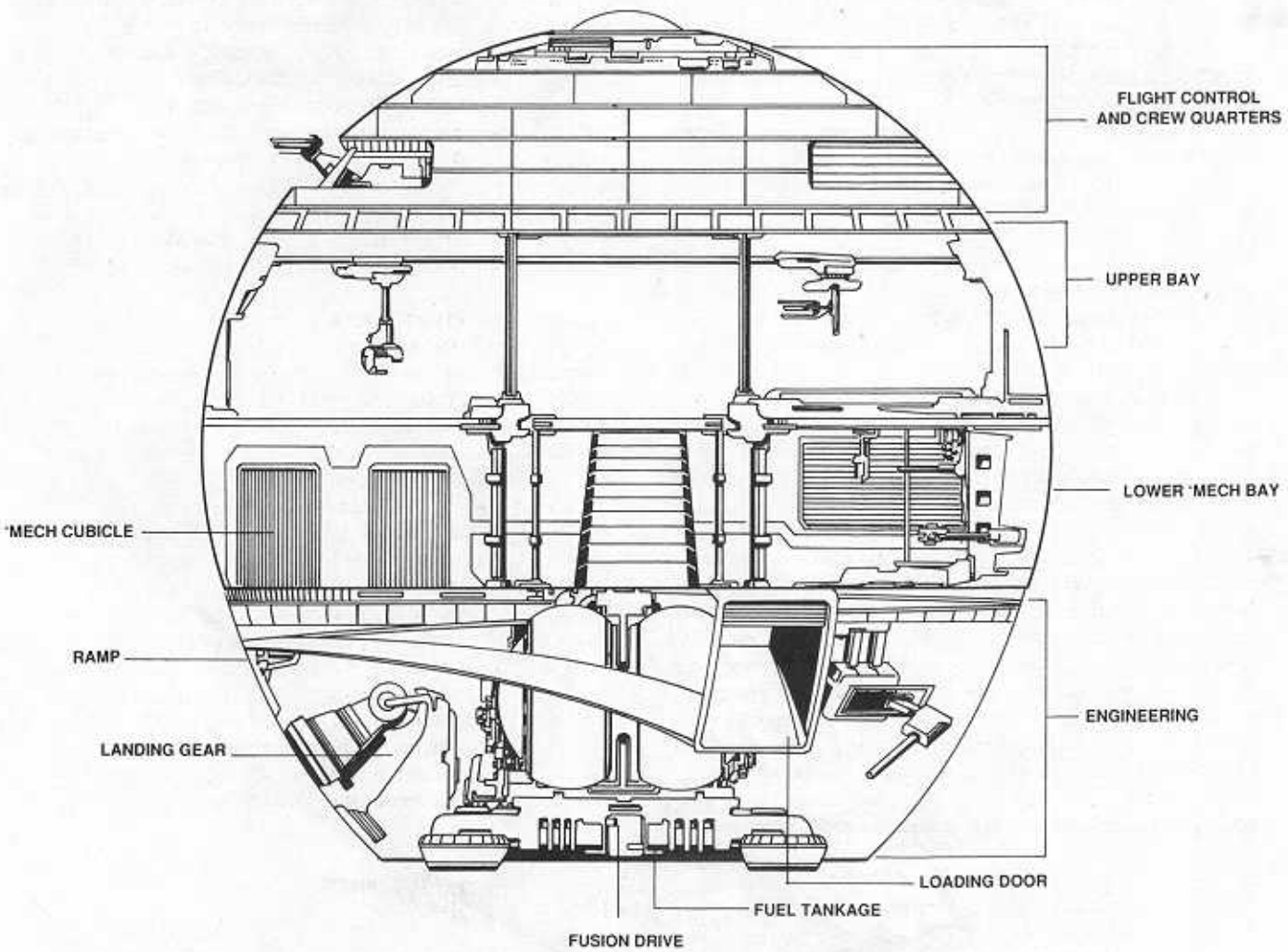
Spheroids maintain altitude by employing their fusion engine core drives against the gravitational pull of a planet. Unlike aerodynes, spheroids have only one drive system (usually referred to as the ship's interplanetary drive system) which is used for both space travel and atmospheric maneuvering. In either case, this drive is roughly equivalent to the aerodyne's maneuver drive. Able to travel under sustained acceleration of about 1 G, the vessels can also accelerate to 3 Gs or more without worrying about the shift of gravitational orientations. Therefore, spheroid DropShips can maneuver at high Gs with significantly less preparation time than aerodynes—in most cases, between 30 seconds to a minute after alerting the crew and passengers. In aerodynes, the preparation process includes the actual moving or packing of all loose equipment and personal items. Depending on the vessel's preparedness, the operation could take anywhere from a few minutes to several hours.

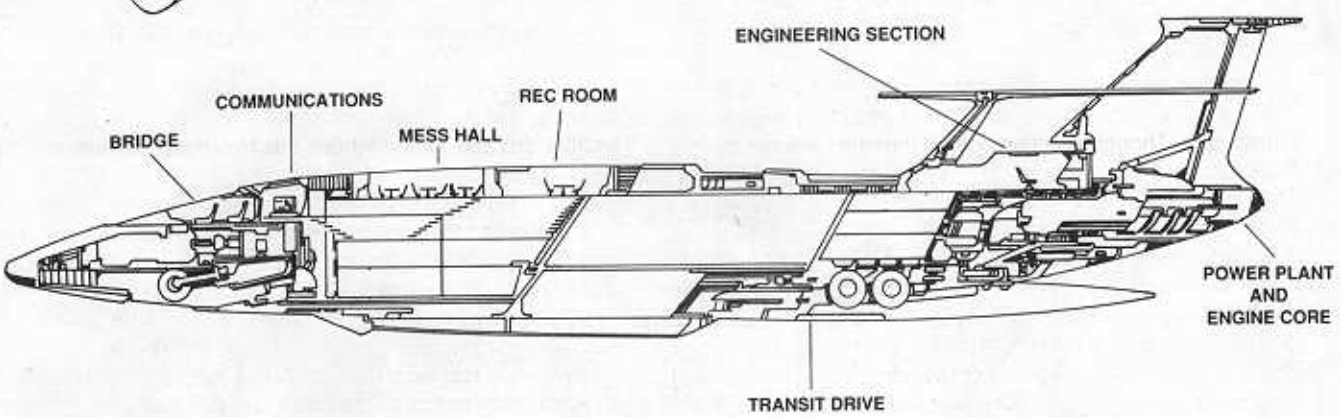
The capability of vertical take-off and landing is probably the spheroid's greatest asset. The ship can land in difficult-to-reach locations and heavy terrain. It does not need a large flat surface on which to land; instead, it needs just enough room to set down. In a heavily wooded area, the scorching blast from the DropShip's fusion drive exhaust always makes plenty of clear ground space on which to land.

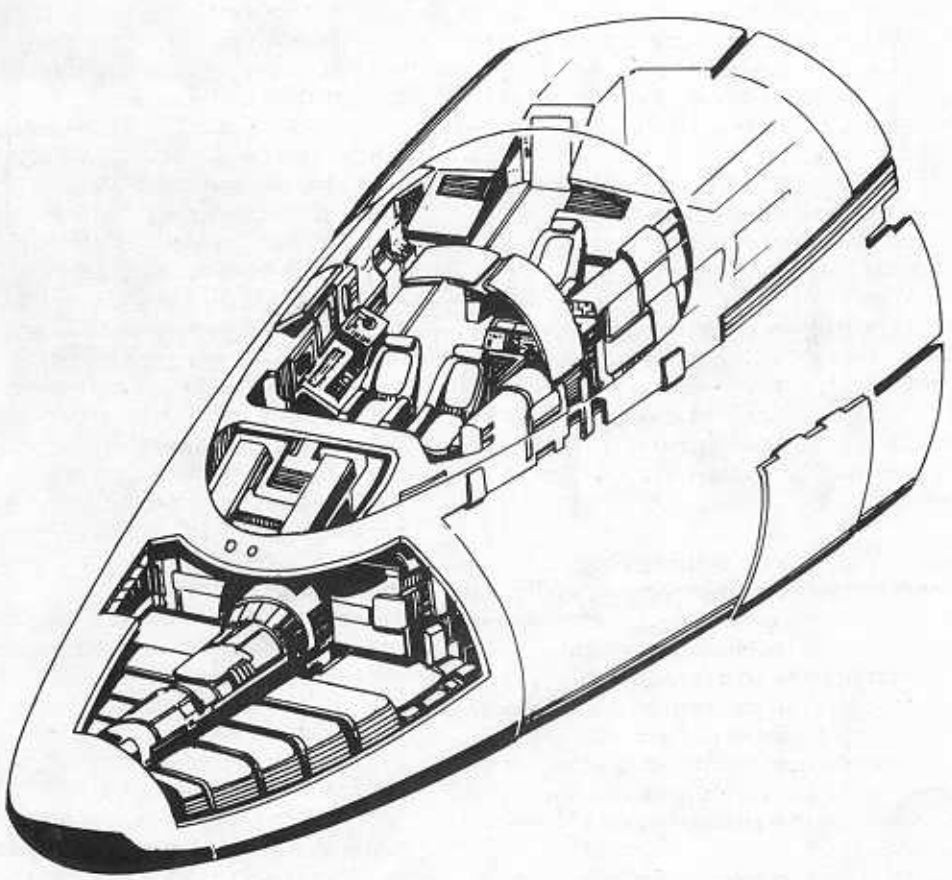
Although vertical flight capability makes this DropShip highly versatile, it also makes it vulnerable. Spheroids use their drive thrust to provide direct lift, and steering and attitude correction are done via reaction control thrusters mounted on the DropShip's hull. Although both aerodynes and spheroids possess these thrusters, they are extremely critical to the stable flight of the spheroid vessel in an atmosphere. If any of these thrusters should malfunction or become damaged, the spheroid will tumble uncontrollably to the planet's surface. Some well-experienced pilots can maintain control of a spheroid DropShip with a damaged thruster, but the task requires tremendous amounts of skill and coordination.



SPACE VEHICLE DESIGN




ENGINEERING SECTION
COMMUNICATIONS
REC ROOM
BRIDGE
MESS HALL
POWER PLANT
AND
ENGINE CORE
TRANSIT DRIVE



ENGINE SECTION

This area is very centralized on spheroid DropShips and is spread out on aerodynes. On spheroids, the section is a cylindrical area at the bottom center of the ship. On aerodynes, the area normally occupies the rear of the DropShip and takes up the entire bottom deck.

The engine sections of each type of DropShip contain the ship's engine core, power plant fuel tanks, and engineering control bay. Though reaction control thrusters are not usually found within the engine section, they are considered to be part of the ship's engineering systems.

Engine Core

The heart of the DropShip, the fusion engine core provides propulsion power for the ship's drives and back-up power for the life support, weapon systems, and all other functions aboard the ship. The section is located at the aft end of the ship and is lined with a heavy layer of radiation and heat shielding. Cylindrical in shape, the unit is unserviceable except for replacing shielding, cooling systems, energy converters, and other major components.

This area can be entered through one or more special access panels, which require a set of tools to open. Because these areas are radiation and thermal hot-spots, they cannot be safely entered while the core is operating. If shut down for a few hours, these areas can be accessed by personnel wearing engineering suits.

The interior of the engine core is crammed with cooling pipes, electrical cables, control lines, plasma ducting, and fuel lines. A small access crawlway winds its way among and around the numerous component systems.

Power Plant

The DropShip's power plant contains a fusion engine that provides electrical power to the ship's systems (expect for the drives). Located next to the engine core, the plant is also heavily shielded, and the area cannot be entered while the plant is in operation. If the plant is shut down for a few hours, engineers wearing engineering suits can access the area through an access crawlway.

Drives

The ship's drives provide the thrust required to carry a DropShip across enormous interplanetary distances. They are generally located at the aft end of the engine core. On aerodyne vessels equipped with separate maneuver and transit drives, the latter drive is located in the bottom deck of the ship.

When activated, the engine core initiates a fusion reaction and shoots the by-product, plasma, to the drives and then out the heavily shielded exhaust nozzles, providing a large amount of thrust. This controlled and continuous explosive force is difficult to control and requires constant attention, especially during combat maneuvers.

The drives are accessible to engineering personnel, but are difficult to repair. As long as the magnetic containment system functions, there is little radiation hazard. If these systems fail while the core or drive is operating, serious radiation contamination may occur.

Fuel

The DropShip's engine core is powered by the fusion of liquid standard diatomic hydrogen, which is stored in large storage tanks located in the engine section. There are two types of fuel feeding systems, each with their own special characteristics.

The first system is simple and requires only moderate maintenance. Small amounts of liquid hydrogen are pumped to smaller storage tanks, where the hydrogen is heated. The resulting increase in pressure feeds the fuel into both the engine cores and the power plant's fusion reaction chambers. The only maintenance required is periodic checking of the lines and the small transfer pumps. This system is best used when the demand for fuel is constant, as in interplanetary flight or JumpShip-to-planet transits. However, it cannot supply the surges in fuel demand needed during combat.

The second system of fuel feeding uses high-speed pumps to keep the system under the constant pressure required by the fusion reaction, regardless of how much fuel is demanded. This system is prone to breakdown because the pumps must operate for extended periods at near absolute zero temperature.

All combat DropShips carry both systems. Not all civilian DropShips carry the second pump system.

Attitude Control Thrusters

Grouped in clusters at various locations on the ship, attitude control thrusters are used to change and control the ship's orientation and heading. In addition, they are used while the ship is in the atmosphere, either to augment existing control mechanisms or, as with most spheroid vessels, to provide the sole means of maneuvering control.

There are a few different ways that thrust is generated in these systems. On very small ships, pressurized or liquified gas can be used. However, because this does not provide much power, larger ships carry oxidizing agents that, when combined with hydrogen from the fuel system, act as small rockets to move the ship. This type of system can be used on ships of any size just by making the rockets larger.

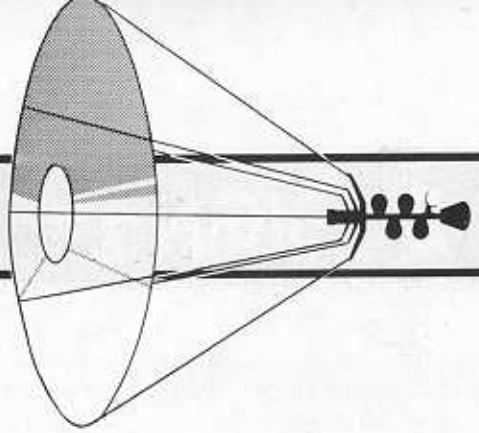
Some ships are equipped with miniature versions of the ship's main drives. These systems, though very powerful, are extremely complex, bulky, and expensive.

Engineering Control Center

This large bay, the control center for the DropShip's drive systems, is present on all but a few DropShips. From here, Engineers control just about every engineering function of the ship, including power routing between various decks, power plant operation, cooling systems, drives, and attitude control thrusters. If this room had access to navigational data, the ship could be flown from here.

The engineering control center, normally referred to as simply engineering, is kept under constant 24-hour watch. On most DropShips, this includes at least one Engineer and a pair of Second Engineers. On larger DropShips, this may include as many as three Engineers with a half-dozen seconds.

Access into engineering is usually under strict control, and only engineering personnel and senior officers have access.



CARGO SECTION

The DropShip's cargo section is generally spread out through the interior of the hull. This is the largest section aboard most DropShips, military or civilian, and takes up anywhere from 30 percent of the ship's mass to 75 percent or more on larger vessels.

The composition and layout of the cargo section depends on the nature of the DropShip. Civilian ships generally have one or more large cargo bays, and may or may not be equipped with a small craft bay or weapons bays. Military vessels always carry weapons bays and cargo bays, and may also be equipped with 'Mech, vehicle, or Fighter bays as well. All landing-capable vessels are also equipped with heavily reinforced ramps for loading and unloading cargo, ammunition, and supplies.

Cargo Bay

The cargo bay is used for storing supplies, equipment, or bulk goods. Numerous tie-down hooks are recessed at three-meter intervals across the bay's floor, walls, and ceiling. Aside from these small depressions, all surfaces inside the cargo bay are flat and smooth. This allows personnel to secure cargo with magnetic clamps, which can be used in lieu of the cable tie-downs.

Cargo bays are often equipped with cranes mounted on tracks in the ceiling. Personnel can operate these cranes either with a remote control unit or from a small booth attached to the bay's ceiling or walls.

To gain access to a cargo bay, personnel may use a cargo door in the hull of the DropShip or a large cargo elevator. On larger vessels, cargo doors are equipped with airlocks.

'Mech Bay

This cavernous section houses the 'Mech storage cubicles, which are large framework enclosures that hold a 'Mech in place during transit. These may or may not be covered by a thin metal skin. Minor maintenance and ammunition loading may be performed on a 'Mech while it is secured inside a cubicle.

'Mech bays usually contain large open areas where BattleMechs may be repaired. Such areas are equipped with retractable repair platforms and cranes. Tie-down hooks are located on the floor so that a 'Mech under repair can be tied down to prevent drifting during zero-G operations.

These bays are also equipped with numerous hook-ups, including fuel lines, air lines, and power cables, to supply 'Mechs. The fuel lines normally tie directly into the DropShip's liquid hydrogen fuel supply. The lines themselves are heavily reinforced hoses equipped with automatic cut-off valves to prevent accidents. Equipped with the same safety features found on the fuel lines, air lines can be directly connected to the 'Mech's liquid oxygen tanks. The power cables are used to power 'Mech systems while the 'Mech's fusion reactor is shut down. In addition, they can provide boost power to start up the 'Mech's power plant.

DropShips designed to carry BattleMechs are normally equipped with drop pack and reentry kits that allow a 'Mech to be dropped safely from high altitude or low planetary orbit. While the ship is on a planet, BattleMechs enter and exit the 'Mech bay via heavily reinforced ramps leading down to the large, 'Mech-sized doors. On smaller vessels, these entry doors lead directly into the DropShip's 'Mech bay.

Loading/Unloading Ramp

Almost every DropShip with cargo-carrying capacity has loading/unloading ramps. These heavily reinforced panels are designed to handle the weight of even the heaviest 'Mechs and vehicles. Although most ramps are extendible, some larger vessels have permanently fixed ramps that reach the cargo, vehicle, or BattleMech bays.

Weapons Bay

All combat DropShips and many civilian DropShips carry weapons bays. Each bay contains a mount, many of which are retractable, equipped with a combination of lasers, autocannons, missiles, and particle projector cannons. Each mount uses a radar-guided targeting system, a separate cooling system, and ammunition stores. Because the ammunition capacity of a weapons bay is quite limited, additional ammo is fed either by self-contained conveyor systems or by the ship's crew.

A central fire control system normally directs and controls the DropShip's weaponry. However, weapons bays on many vessels (especially those designed for combat) are equipped with individual gunnery stations located inside the bay, which can be used to control the bay's weaponry in an emergency. Within these tiny rooms, one person operates the weapons firing controls, and another handles ammunition feeding systems and cooling system controls.

COMMAND SECTION

The command section houses the crew and all the electronic systems needed to operate the DropShip. This is usually the smallest area on the vessel, as the crew and control systems require only a small amount of space. On vessels primarily designed to carry personnel (such as passenger liners and troop transports), this section houses them as well, although they are usually separated from the ship's crew.

The design of the command section varies from DropShip to DropShip, but the components remain the same. These include the KFFC boom, docking collar, avionics, bridge, and crew accommodations.

KFFC Boom

The Kearny-Fuchida field-conducting boom is integral to the attachment of a DropShip to the interstellar JumpShip. After the DropShip has docked, it extends this long, antenna-like device into a receptacle near the docking collar of the JumpShip. The purpose of the unit is to ensure that the DropShip is contained in the Kearny-Fuchida field during hyperspace jump.

Before a JumpShip's hyperdrive is engaged, all docked DropShips must be connected via the KFFC boom. If any DropShip is not properly attached, the JumpShip cannot jump. Anyone less than an engineering genius cannot override this tamper-proof safety system.

SPACE VEHICLE DESIGN

Docking Collar

An extremely sturdy device found on all DropShips, the docking collar allows the vessel to dock safely and securely with JumpShips and other DropShips. Directly attached to the DropShip's structural framework, it is a complex, interlocking structure equipped with a number of coupling devices, allowing the docked vessels to transfer fuel, power, air, coolant, or water. These units are also equipped with a transfer tube for transferring personnel and small pieces of equipment without the need for protective gear.

In addition, docking collars are equipped with high-security systems to prevent accidental separation of the ships during supply or personnel exchange. Docking controls are usually located on the bridge and are protected by an electronic lock to prevent tampering.

Avionics

Powered by the power plant, the ship's avionics include all electrical systems necessary for operating the DropShip. This includes the ship's long-range radar detection and tracking systems, on-board computer systems, and inertial guidance systems. Also, this area houses many non-essential systems, including electronic counter measures apparatus, weapons fire control computers, communications gear, and ship identification transponder.

The electronic components are normally located in a well-shielded section of the DropShip's nose. The numerous antenna arrays are located in a sturdy, non-metallic section of the DropShip's hull, usually in the nose.

Bridge

The bridge is the brain of the DropShip. The size of this room varies from the small cockpit of the *Leopard* to the large central command center of the *Overlord*. Included in this room are the primary controls for the ship's flight, navigation, computer, weapons, and communications systems.

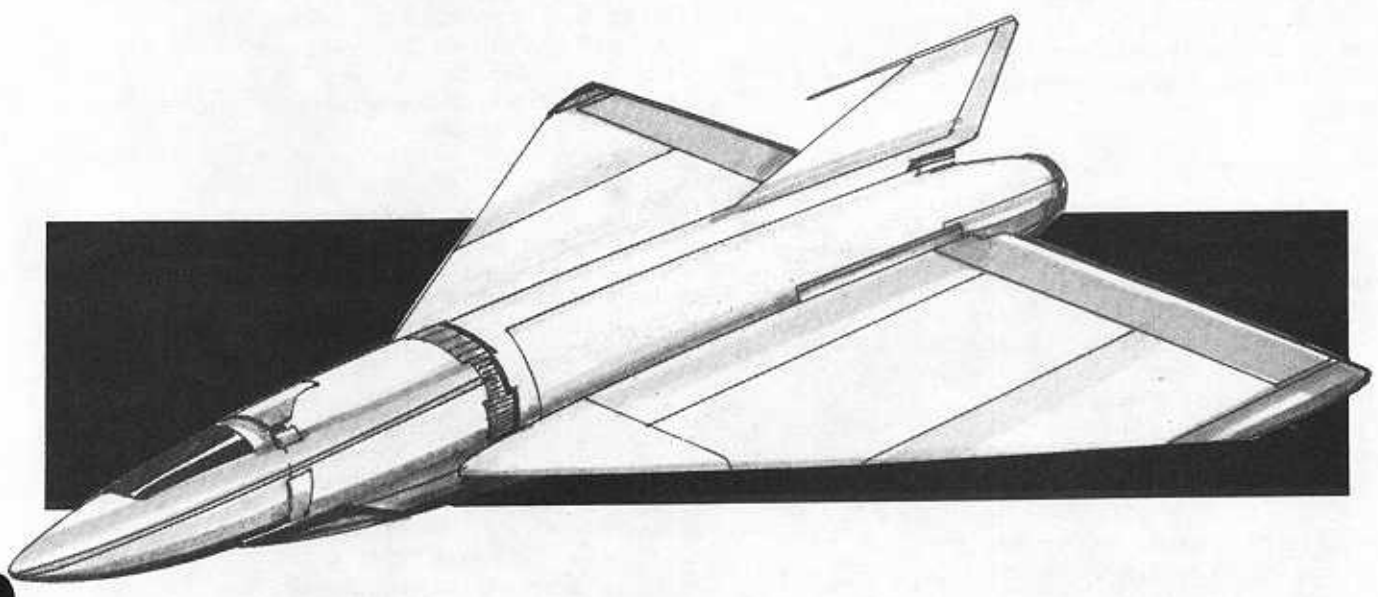
Bridges of different vessels have varying levels of internal security control. On some vessels, the bridge controls a very complex security system in that may be used to seal off and control life support systems in any area of the ship. On other vessels, security is decentralized, preventing the bridge crew from having absolute control of the ship.

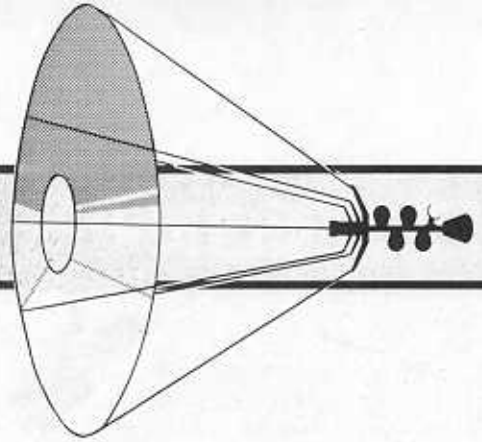
One or more bridge crew members keep the DropShip's bridge under 24-hour watch. Although this duty is considered dull, it is also important to the safe operation of the vessel.

Crew Area

This section contains the crew quarters, mess facilities, medical bay, recreation room, life support, and supply storage. The layout of this area varies from ship to ship. Some house the crew in double or even single occupancy rooms; other vessels, primarily those designed for combat, house the crew in barracks-style quarters with large shared washrooms.

The crew area is usually equipped with a number of escape pods or life boat stations. Each pod or boat can allow four to six persons to escape the ship in an emergency.





JUMPSHIP DESIGN

There are approximately two dozen varieties of JumpShips still operating today. The most common versions are used to transport one or more DropShips between star systems, where they are then released to make their long drop to a planet.

All JumpShips are similar in construction and share many major design components. Some older versions, designed for independent use and not for carrying DropShips, are extremely rare. It is believed that there are fewer than half a dozen of these ships remaining.

Most JumpShips resemble an arrow due to the long, thin Kearny-Fuchida drive stretching from one end to the other. The command section is at the head, the cargo section is in the middle, and the engine section is at the tail. DropShips attach themselves to reinforced docking collars mounted on the exterior of the cargo section. The number of docking collars ranges from one on the *Scout* to nine on the *Monolith*.

During recharging operations, the JumpShip unfurls a large circular sail, which collects solar energy to supply the vessel's Kearny-Fuchida drive. JumpShips are capable of travelling up to 30 light-years in a single, nearly instantaneous jump. After each jump, the vessel must recharge its K-F drive before it can jump again. Usually, the solar energy collector sail is used to recharge the drive, which takes about six to eight days, depending on the star's energy output. In interplanetary space, however, the ships are virtually immobile. Though equipped with fusion drives, JumpShips can accelerate to only .1 to .2 Gs maximum.

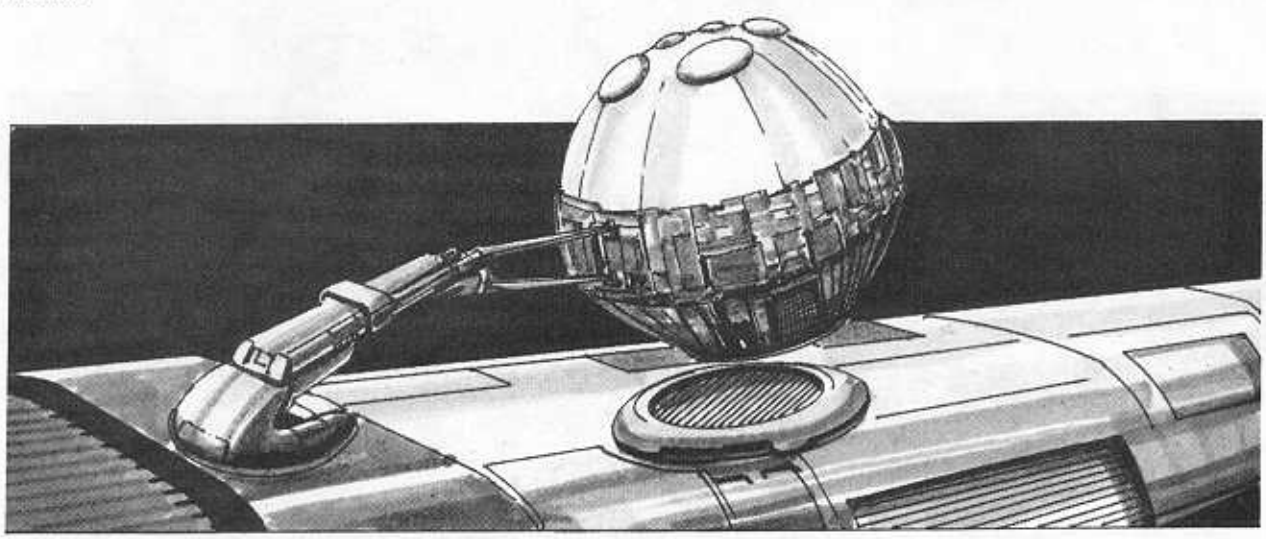
KEARNY-FUCHIDA DRIVE

The Kearny-Fuchida drive is the long cylindrical section that gives the JumpShip its arrow-like appearance. Called the heart of the JumpShip, the K-F drive makes possible interstellar travel throughout the Inner Sphere and beyond. The drive can transport the JumpShip and its DropShips from one star system to another up to 30 light-years away. To perform a hyperspace jump, the drive must be charged from the JumpShip's solar energy collector sail; the sail can charge a K-F drive in about one week.

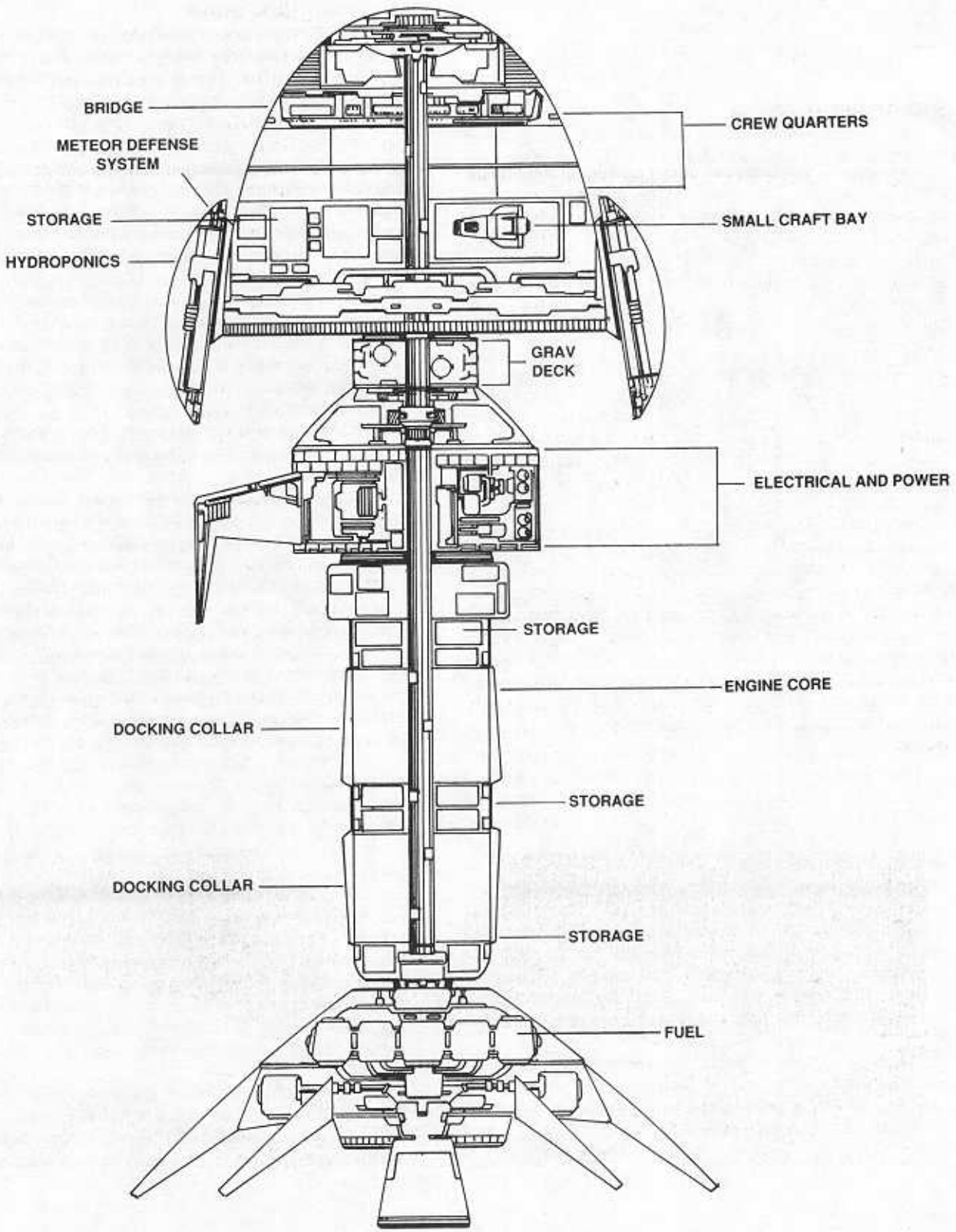
The Kearny-Fuchida drive is composed of a titanium/germanium alloy suspended in a long tube of liquid helium. This turns the unit into a gigantic superconductive capacitor that stores the energy collected by the solar energy collector. At the aft end of the K-F drive housing is the field initiator machinery, which generates the hyperspace field and amplifies it through the main body of the K-F drive. Behind this is the power converting equipment from the ship's recharging systems. The K-F drive is the most massive component of the JumpShip, ranging from 75,000 to over 350,000 tons. Because of technical limitations, these drives cannot be built any smaller than 75,000 tons.

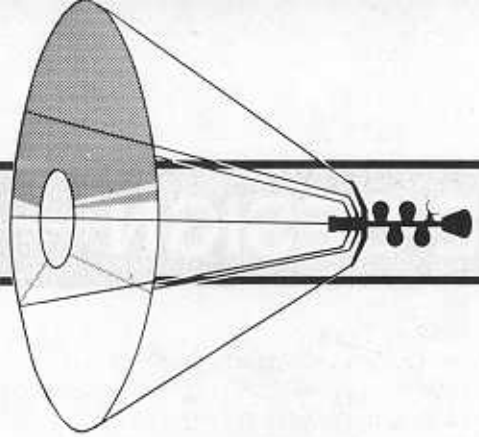
Engineers can easily access the components of the K-F drive through numerous corridors running between the exterior wall of the drive and the armored skin surrounding it. However, repairing the drive is very difficult due to the lack of knowledge about it. Although the drive can take a limited amount of damage and still remain functional, any damage beyond this level disables the drive completely, dumping the drive's liquid helium coolant. Repairs are usually simple to make, but this requires the facilities of a major repair installation.

Kearny-Fuchida drives are quite rare; only about a dozen new ones are constructed each year, which barely compensates for the number of drives destroyed in the same period.



SPACE VEHICLE DESIGN





ENGINE SECTION

The bulk of the JumpShip, the engine section starts from just behind the cargo section and stretches to the back of the ship. This section is identical on all JumpShips, and the only difference is the size and mass of the components, which consist of the station-keeping drives, engine core, power plant, fuel, energy collector sail, engineering control, and a large engine emergency control room.

Station-Keeping Drives

Powered by the ship's engine core, this component is essentially a large version of the drives found aboard DropShips. Although large, they are very small in comparison with the JumpShip's mass, and thus can only produce about .1 to .2 Gs of acceleration. This makes it very inefficient for the ship to perform any interplanetary travel. Generally, the station-keeping drives are used to perform minor maneuvers at the jump point or to travel to a recharging station located nearby. At traditional jump points, the forces of stellar gravity and solar wind are almost completely negligible.

Off-limits to any but engineering personnel, these drives can be accessed through a set of maintenance hatches located in a corridor that rings the engine section. As with the drives of a DropShip, the JumpShip's drives must be shut down for several hours before any personnel may enter. Also, due to radiation levels, they must wear protective clothing.

Engine Core

The fusion engine core provides JumpShip systems with a back-up power supply and provides propulsion power to the ship's station-keeping drives. This fusion engine is identical to the engine core aboard DropShips, except that it is much larger.

The engine core is encased in a cylindrical housing that is well shielded. Access into the engine core is the same as aboard DropShips. Because the JumpShip's engine core is many times larger than that of a DropShip, it is quite a bit roomier and easier to work on.

Power Plant

The fusion power plant provides electrical energy for most systems in the JumpShip. In addition, it can be used to quick-charge the K-F drive. Because of the increased possibility of jump failure or damage to the K-F drive, however, this method is used only in emergencies. A quick-charge can take as little as a few hours, but the shorter the charging time, the greater the chance of jump problems occurring.

Located next to the engine core, the power plant has a well-shielded cylindrical casing. After the plant has been shut down for a few hours, engineers wearing engineering suits may access the area through a series of hatches.

Fuel

Although the Kearny-Fuchida drive itself uses no fuel, the JumpShip's power plant and engine core do. The fuel that both use to sustain fusion reactions is standard diatomic hydrogen. This fuel is held in small storage tanks located near the outer edges of the JumpShip's engine section. The miniscule fuel requirements of the vessel mean that only a small amount of fuel needs to be carried. Because JumpShips located on House Command Circuits must have a quick response and readiness time, they are often fitted with extra fuel tanks inside their cargo bays. Their power plants often use this fuel to charge the K-F drives, due to the long time required in furling and unfurling the solar energy collector sails.

Most JumpShip captains try to keep fuel consumption at a minimum due to the cost of the hydrogen as well as the cost of having a tanker fly out to the jump point. Energy collected by a solar collector sail is free and saves the captain from planning out fuel resupplying.

Energy Collector Sail

This is the JumpShip's primary source of energy for charging the Kearny-Fuchida drive. The energy collector sail, also called the jump sail, is a large circular sheet made from a high-strength polymer and measuring between 800 and 1,300 meters in diameter. It is located aft of the ship, and a number of heavy cables hold it in place. At the center of the sail is a large circular hole that allows the JumpShip's station-keeping drive exhaust to pass through without damaging the sail.

The jump sail is coated with an extremely efficient photochemical that absorbs visible light, ultraviolet, infrared, microwave, and radio waves, and converts the energy into useful power. Because of this energy absorbing quality, these sails produce little or no echo on deep space radar. The collected energy is transferred to the JumpShip via two sets of power transmission lines located on opposite sides of the sail.

Although the jump sail is composed of high-strength polymers, its sheer size makes it fragile, and it is highly susceptible to rips, meteorite damage, and weapons fire. Because of its delicate nature, furling and unfurling a jump sail can take from 100–200 minutes, depending on the size of the sail.

Engineering Control

Located at the front end of the engine section, the engineering control room is used to monitor the K-F drive, station-keeping drives, power converters, cooling systems, engine core, and power plant. Unlike the engineering control center aboard DropShips, the JumpShip's engineering room has little control over the operation of the vessel; it is used only to monitor and organize damage control crews and maintenance teams. The drive systems are controlled from an engineering station on the bridge.

The engineering control room contains several ship systems displays that take up much of the wall space. These displays show damaged areas of the ship, and can be tied into a communications panel to keep track of repair and maintenance teams.

SPACE VEHICLE DESIGN

CARGO SECTION

The JumpShip's cargo section consists of many bays that are spread throughout the ship. All JumpShips have cargo bays, and nearly all have small craft bays. The average JumpShip's cargo section generally masses under 10,000 tons and is limited, not by space, but by function. As the primary mission of the JumpShip is to carry DropShips, there is little need for large amounts of cargo storage or small craft. Also, due to the noncombative nature of the JumpShip, there is little need for offensive weaponry.

Cargo Bay

Cargo bays aboard JumpShips are large, open areas closely resembling those found aboard DropShips. They are located within the crew section along the neck of the ship, where the DropShips dock. Although the cargo bays are often equipped with large airlocks, most cargo carried aboard JumpShips is not harmed by vacuum.

The JumpShip's cargo-carrying capacity is limited because the JumpShip can transfer its cargo only to a DropShip. For DropShips to operate at maximum profit, they must keep their cargo holds full at all times, and thus have little or no room to take cargo from a JumpShip. For this reason, the JumpShip's cargo holds are generally used only to carry extra supplies. Some vessels have internal cargo bays equipped with manipulator cranes and tie-down hooks.

Access to cargo bays is through either a large cargo door or a small personnel door, which is normally equipped with an airlock.

Docking Collar

Most JumpShips are equipped with from one to nine DropShip docking collars. Similar to the DropShip's docking collar, this collar holds the DropShip securely during the critical moments of hyperjump. On most JumpShips, the collars are located on reinforced hardpoints along the exterior of the Kearny-Fuchida drive. They are equipped with the supply transfer fittings, and the control valves and switches for these connections are located in a small docking control booth located next to each collar. Many JumpShips have additional equipment located near the docking collars, ranging from manipulator cranes to extendible platforms for making DropShip repairs.

Small Craft Bay

All JumpShips carry one or more small craft, which are used to transport personnel, supplies, and equipment between the JumpShip and nearby ships and stations. Small craft bays are equipped with fueling gear and power hook-ups for starting a vehicle's fusion power plant. Some bays are also equipped with platforms, manipulator cranes, and other equipment used to maintain and repair small craft.

Located in this bay are the storage cubicles used to store small craft. These cubicles are similar to those used to carry 'Mechs—they are sturdy frameworks that surround the small craft and hold it securely in place. The main difference between the 'Mech cubicle and the small craft cubicle is that, instead of being vertically mounted, small craft cubicles are oriented horizontally.

Meteor Defense System

To protect them from meteor hazards, many JumpShips are equipped with one or more large lasers or particle projector cannons. Most of these weapon systems are not strong enough to damage other space vessels as JumpShips, by accepted codes of conduct, are not considered military targets. Anyone attacking a JumpShip faces severe repercussions from both friend and enemy alike. Meteor defense systems are usually mounted in large turrets outside the JumpShip's command section housing. This position gives the system a large field of fire.

Engineers can access the turret housing through a maintenance hatch located at the base of the turret. Most turrets also possess one or more external access hatches for large-scale repairs.

COMMAND SECTION

The large command section is mounted at the forward end of the JumpShip, forming the head of the vessel's arrow-like appearance. Although the shape of the command section varies, it is usually bullet- or egg-shaped. Included in this large pod is the JumpShip's control facilities and crew accommodations. In addition, cargo and small craft are often housed in this section as well.

Running through the center of the command section, from the back to the nose, is a shaft containing the forward portion of the Kearny-Fuchida drive machinery. Well-shielded from the rest of the command section, the shaft cannot be entered except through engineering access hatches located outside the hull of the command section.

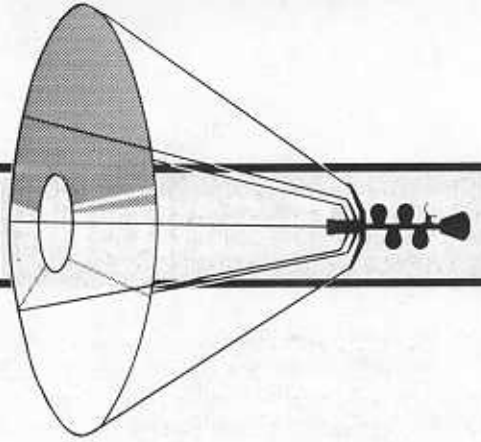
On some vessels, a set of meteor defense weapons, mounted in large turrets, are fixed onto the sides of the command section. Because these are self-contained weapons mounts, containing their own cooling systems and fire control, they are not considered part of the command section.

Bridge

The bridge of the JumpShip is generally quite large in comparison with the bridge of the DropShip because the function of each is different. Aboard DropShips, the atmosphere on the bridge is tense. Many decisions require split second timing, and the pilot and captain must be able to concentrate on their duties with minimal distractions. The DropShip's bridge, then, has limited functions, thus reducing the number of personnel present.

On the JumpShip bridge, however, things are different. Because there is little maneuvering to be done and because the role of the JumpShip is passive, bridge duties are much less demanding. This gives the bridge greater control over the function of the ship without creating confusion among the operating personnel.

The JumpShip's bridge is about twice the size of the average DropShip's bridge. This area contains controls for the vessel's interplanetary maneuvering and navigational systems, as well as hyperspace flight and navigational systems. Also located here are the communications station, internal



security systems, environmental controls, and engineering systems controls.

The engineering systems stations contain monitors that duplicate the information received by the engineering control room. Unlike that room, however, the stations have complete control over the power plant, K-F drive recharging systems, jump sail deployment equipment, and the Kearny-Fuchida drive itself.

Avionics

The JumpShip's avionics are spread throughout the command section. These systems include deep-space detection and tracking systems, interplanetary and interstellar navigational systems, radio and laser communications systems, identification transponders, and multi-purpose computers.

Security in these areas is rather high, with alert indicator lights mounted on the internal security board of the JumpShip's bridge. Also, the areas are usually protected by electronic or sophisticated mechanical locks. Entry is available only to engineering personnel and specific bridge personnel.

Grav Deck

Found exclusively aboard JumpShips and space stations, this large, ring-shaped section provides the crew with an artificial gravity environment. Too small to contain living accommodations for the crew, it is commonly used as a lounge for off-duty personnel.

The grav deck produces artificial gravity by spinning slowly, like an enormous centrifuge. As the deck spins, all objects on it are pushed away from the center. The wall becomes the floor of the deck, and "up" is toward the central hub of the deck. This can cause a slight disorientation among the inhabitants, as "up" is generally considered to be in the direction of the JumpShip's nose.

Access into the grav deck is through a passageway located near the deck's central hub. Transferring to or from this section is a dizzying experience, and can be dangerous to those who are inexperienced with the procedure.

Because the deck's drive motors and bearings are delicate, several locking arms must brace the deck in position before the JumpShip performs any maneuvering more complex than station-keeping.

Crew Decks

The crew deck contains the living quarters and other accommodations for the JumpShip's crew. Normally consisting of two or more decks, this section occupies a cylindrical area in the middle of the command section. Components include personal storage rooms, mess and recreation facilities, medical facilities, food and water storage, life support and waste processing systems, and hydroponic gardens.

Living accommodations for the JumpShip's crew are quite good to compensate the crew for the long periods of time spent in zero-G. Crew quarters consist of single occupancy rooms containing a bed, desk, and chair, a small dresser, and a number of cabinets. Bathing facilities are shared between two rooms.

There are a number of life boat stations located in and around the crew decks. These are easily accessible from any of the crew decks and, in an emergency, can be reached in seconds.

Personnel travel between the crew decks and the rest of the ship through a pair of elevators that run the length of the command section. These elevators are located against the outside of the Kearny-Fuchida drive, and a single access tunnel is located next to them.

SHIPBOARD DETAILS

The systems and mechanisms described below are common to both DropShips and JumpShips.

CONTAINMENT DOOR

These large doors can seal off compartments of the ship, should decompression, fire, or combat threaten the ship. These doors can be manually operated from the bridge or from a control panel set near the door; they operate automatically if a compartment loses air quickly or if a fire breaks out. Doors that close automatically will reopen automatically as soon as the environment within the sealed compartment returns to normal.

The bridge manual controls override the local containment door controls on most vessels. However, if a person with an engineer's portable console ties into the containment door electrical lines, he can override the bridge's control.

Containment doors are often constructed in pairs to form a small airlock between them; thus can crew members access a depressurized compartment. Some vessels, instead of having two heavy containment doors, have a single door with an airlock next to it. The airlock allows personnel to pass into adjacent compartments without opening the containment door. These airlocks operate using the same safety and security systems as the containment doors.

AIR HOOK-UPS

Every compartment contains at least one set of air hook-up connectors, which tie directly into the ship's emergency life support system. Using air masks located in a nearby cabinet, a person can tie directly into a hook-up to get fresh air. Air hook-ups are used mostly if a compartment has an atmosphere that contains harmful elements; they cannot save a person in a depressurized room unless he is wearing some type of pressurized suit. In this case, the air line can provide him with an external supply of air, saving the suit's air supply.

SPACE VEHICLE DESIGN

POWER HOOK-UPS

Adjacent to every air hook-up connector is a power hook-up connector, a wall outlet that ties into the ship's main power system. This connector can provide power as long as the ship's power plant is operating; it does not tie into the emergency power system. Using a special adapter, any battery-powered item can be attached to a power hook-up, allowing laser weapons, lights, and other electrical devices to operate almost indefinitely.

COMM PANEL

One comm panel is located within each compartment. By using a special selector keypad, the user can contact any other comm panel aboard the ship, and conversations on this line are private unless tapped into by either the bridge or someone with an engineer's portable console. In addition, the selector allows the user to broadcast a message across the ship's loudspeaker system.

The comm panel also has a built-in receiver/transmitter, which can hook-up to an intercom-link (see the New Equipment section of Game Additions.)

EMERGENCY LIGHTING

Emergency lighting is located throughout all sections of a ship. These low-power lights draw power from a set of emergency batteries, located beneath the floor panels in each compartment. Continually charged by the power plant to keep a full charge, the batteries can keep the corridors lit and maintain life support for up to 48 hours. A switching relay triggers the lights to turn on whenever the main power is cut off and to shut off as soon as power is restored. The dim light enables personnel to read if they hold the material directly under the light. The primary function of this emergency lighting is to provide enough light for personnel to find an escape pod or an undamaged section of the ship.

ENVIRONMENTAL MONITOR

Environmental monitors are a set of readouts displaying a compartment's atmospheric information. Located on corridor walls, each device gives a continual display of the area's air pressure, temperature, humidity, and percent of oxygen and carbon dioxide. On some vessels, these units also indicate pressure changes, sound frequencies, and air currents. These particular models often tie directly into a special intruder detection system, which uses the monitors' information to track the movements of personnel through the ship.

FIRE SUPPRESSION SYSTEM

A fire on a ship must be stopped quickly, not only because fire will damage the ship, but also because the large amounts of toxic chemicals generated can quickly overload a ship's life support system. For these reasons, all space vessels carry fire suppression systems, consisting of an array of pipes that lead to every room and corridor on the ship. If a fire breaks out, containment doors automatically seal off the burning room or corridor, and then the pipes release a blast of halon, carbon dioxide, or some other fire retardant into the room.

The mechanism that triggers the system is a series of heat sensors and smoke detectors, which are also tied into the environmental monitor panels. When these units are triggered, the fire suppression system switches on, a warning bell sounds, and a fire detection panel on the bridge indicates the location of the fire.

MANEUVER WARNING

The maneuver warning is a simple alarm system used to alert the crew before the ship performs any maneuvering and before engines are activated or shut down. This allows the crew to brace themselves before the ship changes course or velocity. Activated from the bridge, the warning system is a set of rotating, amber-colored beacons located at each end of a corridor. Along with this visual warning is a computer-generated voice, warning of the coming maneuver. The beacons draw power from the ship's power plant.

COMBAT ALERT WARNING

The combat alert warning operates exactly like the maneuver warning except that the beacons are red instead of amber. Located next to the amber beacons, these beacons operate off the emergency batteries and can continue operating even if the vessel has been crippled.

PRESSURE INDICATOR

The pressure indicator is a simple display located above every containment door. When the pressure between the adjacent compartments is equal, the indicator displays a green light. These devices draw power from emergency batteries.

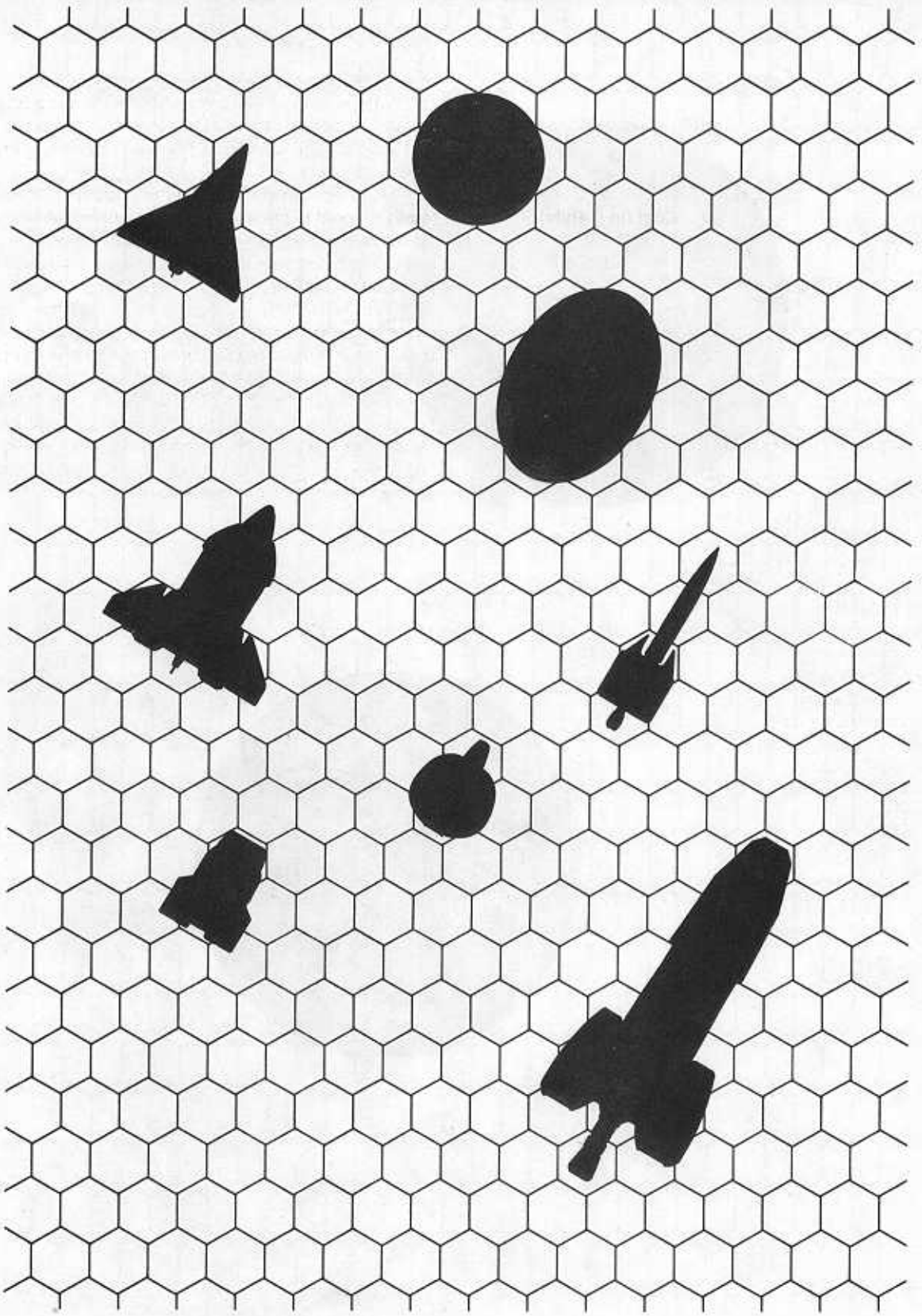
MANUAL HATCH/DOOR MECHANISM

Located beneath the floor panel on each side of a door, this device is a hand crank for opening a door after its power has been cut off. Every sliding door or hatch has two of these units. It takes approximately ten seconds to crank open a door; however, the door must be unlocked before it can open. To lock or unlock an unpowered door, a person must use an engineer's portable console with an external power pack.

FLOOR PANELS

All decks except those designed to bear heavy mass are covered with removable floor panels, solid metal plates that bolt to braces beneath the floor. In engineering access corridors and most other places not located in the main crew areas, the floor panels are metal grids, allowing repair and maintenance crews to spot damaged areas beneath the floor.

Beneath these panels is a large number of pipes, conduits, and control units. The pipes, including water lines, insulated coolant lines, air ducts, and sewage lines, have built-in safety devices that automatically close the lines if they lose pressure too quickly. This prevents the ship's entire water, air, and coolant supplies from completely draining if a compartment experiences uncontrolled decompression. To prevent an entire section of the ship from being thus cut off, every compartment is fed from at least two sets of lines.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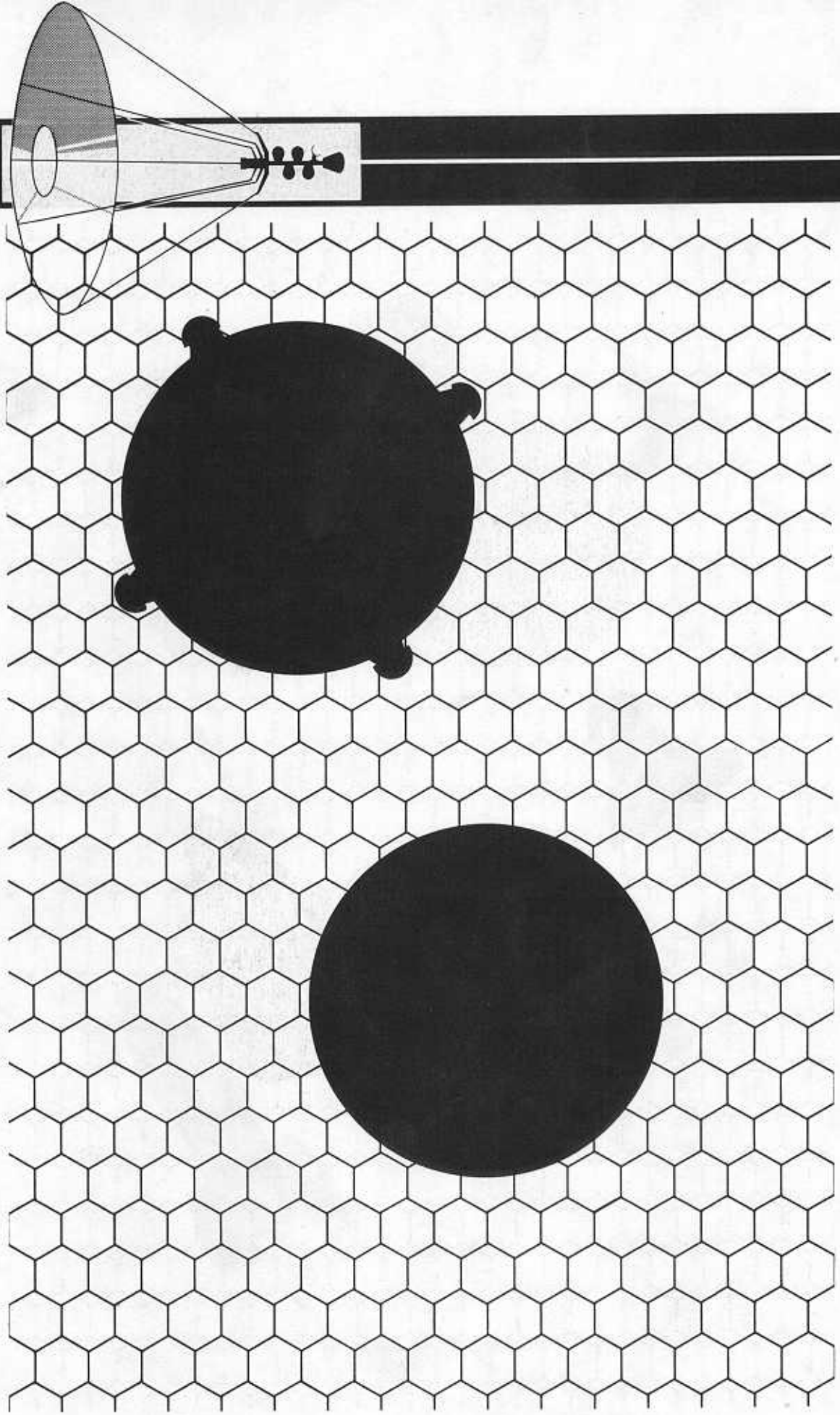
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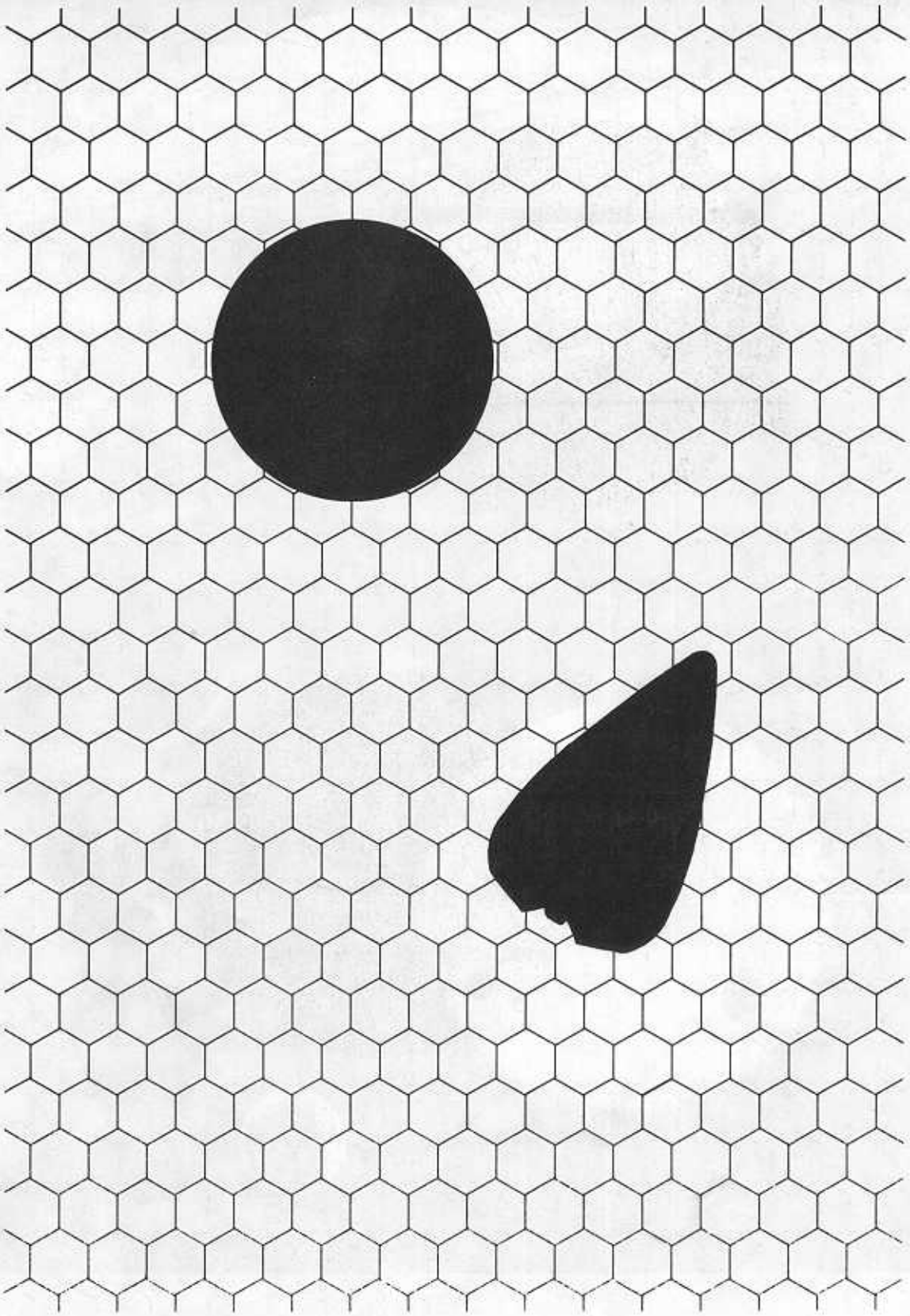
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