

Apparition Class Multirole Deep Intruder



“Get In...Get Out...Don't Get Caught!”

Foreven
FREE SECTOR

Credits

Author:	Noah J. Ternullo
Creative Review & Support:	Dina Novitskaya Evan Hellring
Game Mechanics Review:	Fred E. Golder
Copy Editing:	Lisa Ternullo
Floor Plan Artwork:	Noah Ternullo
Raptor OSV 3d Model & Rendering:	Noah Ternullo
Pilot Bryce Model:	Oleg
Wraith 3D Rendering:	Mark Hirst http://www.cambrianmoons.com
Front Cover:	Mark Hirst (Ship) Ron Miller (Background)
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Back Cover:	Mark Hirst

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Mission Role

“Yeah, I know...Too many witches spoil the brew, but what if we could give each of them their own cauldron?” - Tor Bendick (Business Development)

The Apparition Class was designed as a multirole deep intruder. The expense involved in creating a ship that could reasonably intrude without the notice of a high tech polity was high. Mitigating construction costs required satisfying the needs of as many customers as reasonably possible. The difficulty is that the demand for high jump capacity stealth ships runs the gamut of niche markets. Creating a single ship that satisfied every market – from corporate espionage, counter piracy, and military intelligence, to supply line disruption, VIP transport, and smuggling – jeopardized the ship's design cohesion making it useful to no one.

The solution found was to build the core systems of the ship under one design, and allow customization through modular and reconfigurable bays. By making these bays customizable in 30-ton increments, the Apparition class takes advantage of the wealth of ubiquitous modules available for the 50-ton modular cutter. Not only does this allow each ship to satisfy a particular customer, but it actually allows the ships to be radically reconfigured on a mission by mission basis.

Design Rational

“Get in, Get out, Don't get caught. It's that simple.... Don't screw it up.”

- Commodore Eneri Gefl

Times are changing. While some polities can amass ships in excess of 10,000 tons, many cannot. To a great number of interested parties the idea of a pocket-sized ship with significant stealth capabilities, range, and payload/cargo capacity was appealing. The underlying concept was summed up by Commodore Eneri Gefl. Arrive without notice, do what you need to (harass, gather intel, raid commerce, retrieve or deliver critical personnel and supplies), and get out without getting caught, or better yet even noticed.

A ship like that could cripple a much larger fleet by striking at the soft underbelly of a long supply chain, crush commerce deep within an enemy's territory, deliver deep intrusion ops teams, or pulling out friendly forces in very hot situations without loss. All of these underpin the design rationales behind Apparition Class ships.

The Apparition Class Size

“Excuse me sir, with respect, no matter how many curtains you throw over it, someone is going to notice there's an elephant hiding behind the drapes.”

-Intern Jevs McKne

When the architects laid down the Apparition class, several key design decisions were made. Obviously a size needed to be chosen. Larger ships could carry more cargo, but cost significantly more

than smaller ships. Additionally stealth was the highest priority, and it was determined that larger ships (with their corresponding larger power plants and maneuver drives) would be harder to conceal. The trade off was made to settle on a 400-ton ship. Analysis showed that 400 tons was the sweet spot between cost, cargo capability, and detectability that would satisfy over 88% of the defined mission types. Once that decision was made, full attention was turned to ensuring low probability of detection (LPD).

Low Probability of Detection

A great number of higher tech stealth technologies were available, but the decision was made not to rely solely on one or two individual technologies. Instead a suite of architectural decisions, as well as applied solutions across several technology levels, provide the Apparition class with advanced LPD capability.

First, an analysis of mission types revealed that the class would or could spend a great deal of its time “facing” enemy sensors. Some missions required the ship to actually travel toward, and then away from, these sensors as it delivered its cargo and left the operating area. Given this, the entire craft was designed to provide as little detectable surface area as possible. This one decision gives the Apparition class its characteristic thin, but broad, flying wing streamlined frame. The whole ship is less than 10 meters “thick” or tall, roughly the equivalent of a ship ¼ its size.

Additional measures include:

- Venting thermal exhaust indirectly via folds along the hull, and doing so in ways that don't cause a concentrated thermal foot print.
- Applying to both the upper hull and internal structural elements a TL 12 coating that actually absorbs and diffuses most forms of electromagnetic radiation.
- Placing arrays of minute grav plates under the skin of the hull, to create false gravitic echoes, thus defeating highly sensitive densitometry detectors.
- Providing additional stealth capabilities as options for those whose mission profiles require even more attention to this aspect of the craft.

Jump Capability

*“Jump 6 is a must have, a **must have**? Fine, we'll get you there Commodore, but I hope you can accomplish your mission with the pilot, a cup of coffee and hygienic clippers, because that's all you're going to have room for. Oh yea, and you better start waiting tables or pumping fuel in your down time cause you'll need a lot more extra cash.”*

- Chief Engineer Krick Fierson

The Apparition class needed to have long legs. While a Jump 5 or 6 capability would allow the ship to operate across an extremely long range, the resulting loss of internal ship space to jump fuel, and the incredible expense of such drives, proved too stifling for most budgets. A Jump 4 capability was calculated to be effective for over 80% of her mission types. To satisfy more than 15% of the

remaining, she would be fitted for drop tanks.

With the addition of drop tanks, it would be possible for the ship to make two successive Jump 4's, giving it a potential operational range of 8 parsecs without the need to refuel. Even so, the nature of the Apparition class would likely mean eschewing established space faring infrastructure near its operational area. This led to the decision to streamline the ship and mount both fuel scoops and fuel processing equipment. As long as any kind of fuel could be found in the wild, the Apparition class would never have to see a port to remain powered.



Maneuver Drive

“Yeah, delivery of uh.... let’s say critical medical supplies, teddy bears, and relief food... to a, uh...wrongfully... blockaded or interdicted system is what you call a real risky business. Even with the best technologies, we’re bound to get caught sometime. I want to be able to outgun anything that catches me, and outrun anything I can’t outgun.”

- “Dr.” Rex Black, Captain of the free trader Metalegal Dispensation (MD)

The biggest fight within the design team was over the size of the maneuver drive. Originally a 4G maneuver system was spec'd out. With a jump drive rating of 4 and a maneuver rating of 4, the power plant could be tuned to a rating of 4, optimizing cost, space, and fuel consumption. The problem was that this pleased none of the customers.

It was pointed out that system defense boats, surveillance crafts, military escorts, and

patrol cruisers could match or exceed that 4G, potentially bringing Apparition class vessels into sustained combat, which the class wasn't designed to withstand. Some customers and some missions seem to have a much higher probability of precipitating in conflict than others, but the general mood was the same. Faced with the revolt of the majority of stakeholders, the design team opted for a much more powerful fusion plant, and 6 G engines.

No one was entirely happy with the increase in cost, and loss of cargo capacity, but it was accepted by the customer set. As an unintended benefit, some of the military customers now had enough raw power to mount large weapons bays, which opened up a whole new set of potential configurations and missions.

Modular Reconfigurable Cargo Bays

Apparition class cargo bays are 120 tons. The ship comes with scaffolding and plating to seal off the entire bay as well as break the bay into multiple independent bays. The cargo area can be broken into:

1. A Single 120-ton bay
2. Four 30-ton bays
3. Two 60-ton bays
4. Any combination of 30- and 60-ton bays equaling 120 tons

Though the mission types required differing cargo, each one traded off their cargo space for only one other resource, fuel. Because fuel was always the common denominator, the Apparition class at baseline comes equipped with 24 collapsible fuel bladders built into the floor and ceiling bay doors of the cargo spaces. Bladders, each of which can hold up to 5 tons of fuel, are usually deployed in floor and ceiling pairs, but don't have to be.

As long as a cargo bay has enough free volume, these bladders can be deployed on command from the bridge or engineering without the need for human intervention at the cargo bay. The floor/ceiling simply opens, and the carbon fiber bag begins to inflate with fuel to fill the space.

The bladders are organized into 4 banks of 6 bladders with 3 bladders coming down from the ceiling, and 3 bladders rising up from the floor. The division of the 4 banks match the boundaries of the four 30-ton bays configuration of the ship. This does not constrain their use to that configuration, but rather allows the flexibility to use the fuel bladders in any valid cargo bay configurations including a single 120, two 60, or any combination of 30/60 tons desired.

For example, a 50-ton meson bay gun may be installed on the ship via a single 60-ton cargo module. This leaves 10 tons available in the cargo bay. The fuel bladders could easily fill this space, providing an additional 10 tons of fuel and ensuring that the space isn't wasted.

Interoperability with 30-Ton Modular Cutter Payloads.

Each 30-ton segment of the cargo bay comes equipped with fixtures, harnesses, and hooks matching the specifications for 50-ton modular cutters. These include, power, data,

water, air, sanitary lines, etc. Any standard 30-ton module meant for use in a 50 ton modular cutter may also be deployed into the Apparition class without modification.

Bay Doors and Cargo Access

The Apparition class offers a 3-meter-wide cargo airlock forward of the cargo area. While it has a ramp, this is meant to load or unload only smaller pieces of cargo. For rapid cargo access the desired portion of the area may be elevated either up through the dorsal, or down through the ventral, surface of the ship.

When landing on a surface with significant gravity, the landing struts are capable of elevating the bottom of the ship, providing sufficient clearance to fully lower the cargo area. This is roughly 10 meters off the ground. Additionally, the landing struts are deployed at such an angle that access to the deployed cargo area from either forward or aft is not obstructed.

The cargo bay may be lowered/raised in the following increments:

1. Any combination of 30-ton bays
2. The entire 120-ton area (all 30-ton bays simultaneously)
3. One 60-ton bay (two 30-ton bays simultaneously)

Once clear of the ship, 30-ton or 60-ton modules may be installed or removed. Empty bays may have cargo loaded directly to their deck.

Sometimes, access is needed from the exterior of the ship to some portion of the cargo bay, without releasing the bay. To accommodate this, the Apparition class provides two large bay doors each containing two more sets of smaller bay doors on both the upper and lower surfaces of the ship. The larger bay doors each reveal 60 tons worth of cargo area, and can be opened independently of one another. The small bay doors come in 15-ton pairs and must be opened together, allowing access to the top or bottom of the ship by individual 30-ton bays.

In general, the stealth coating protecting the ship is not duplicated in the 30-ton or 60-ton modules that can be installed. For each bay open, the probability of detection increases. For every 30-ton increment of bay exposed, decrease the stealth bonus by 25% for as long as the bay is open.

Changing a 30-ton module is an easy task, taking between 1-6 minutes. A 60-ton module takes 10-60 minutes to install or swap out, and is also an easy task. More time can be taken to ensure absolute success.

Apparition Class Ships

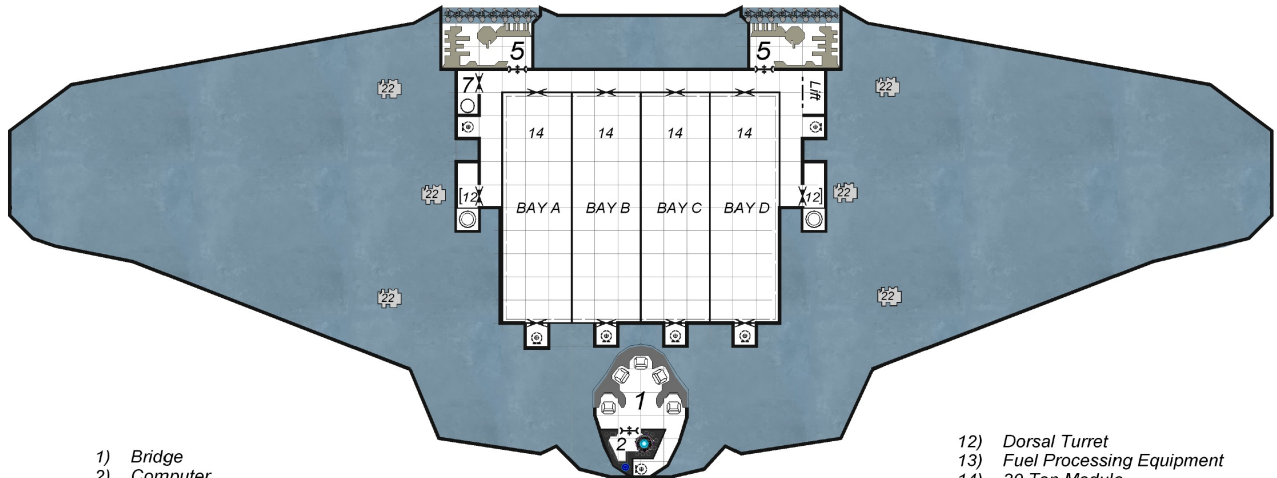
NAME	LAID DOWN	COMPLETED	DISPOSITION	NOTES
XP-123005	021-1101		Unknown	Prototype on indefinite loan to initial customer. Informally known as the “Spook of Innovation”
Phantom	212-1102	295-1104	Delivered	
Apparition	214-1102	294-1104	Delivered	First to formally complete and be delivered.
Specter	033-1103	299-1104	Delivered	Intelligence Acquisition, Comm and Sensor Upgrade, Improved Stealth
Wraith	041-1103	307-1104	Delivered	High Risk Logistics, Intelligence Acquisition, VIP Transport.
Banshee	062-1103	361-1104	Delivered	Deep Naval Suppression, 60-ton Meson Bay, 4G maneuver downgrade, +2 Particle cannons, 10 tons extra internal fuel capacity, Enhanced Stealth
Stellar Shadow	073-1103			Orbital Intrusion, 60-ton Orillary Module, OIM, OSM, Ground Tactics Center
Night Shade	124-1103			
Enterprising Spirit	142-1103			High Risk Logistics Support
Liberty's Ghost	148-1103			VIP Transport

The first hulls took 64 weeks to complete. Lessons learned and good tooling have since reduced production time to 38 weeks and a 10% reduction in cost.

Wraith

APPARITION CLASS Multirole Deep Intruder

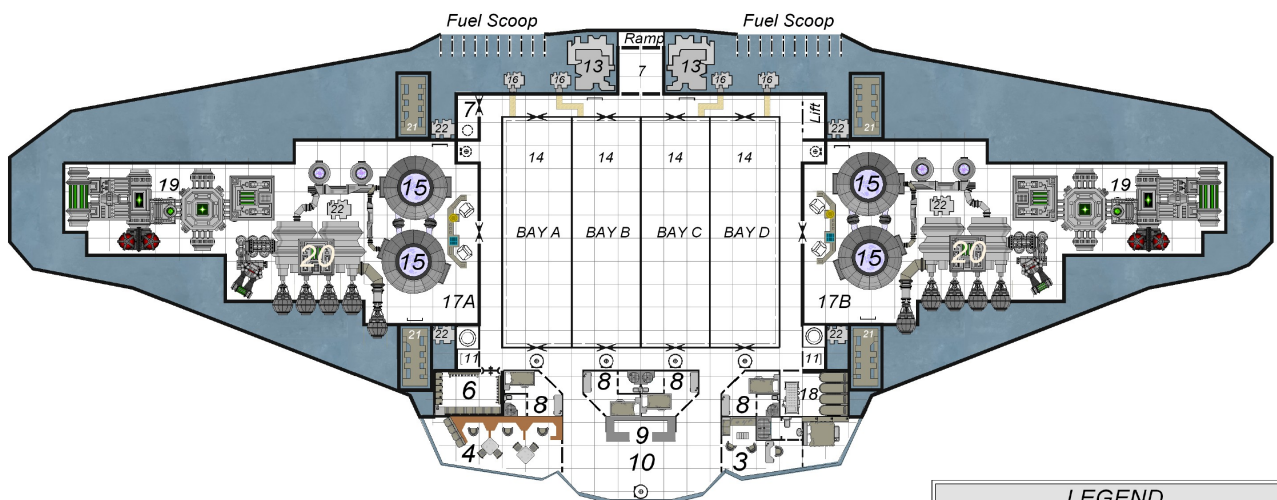
Upper Deck



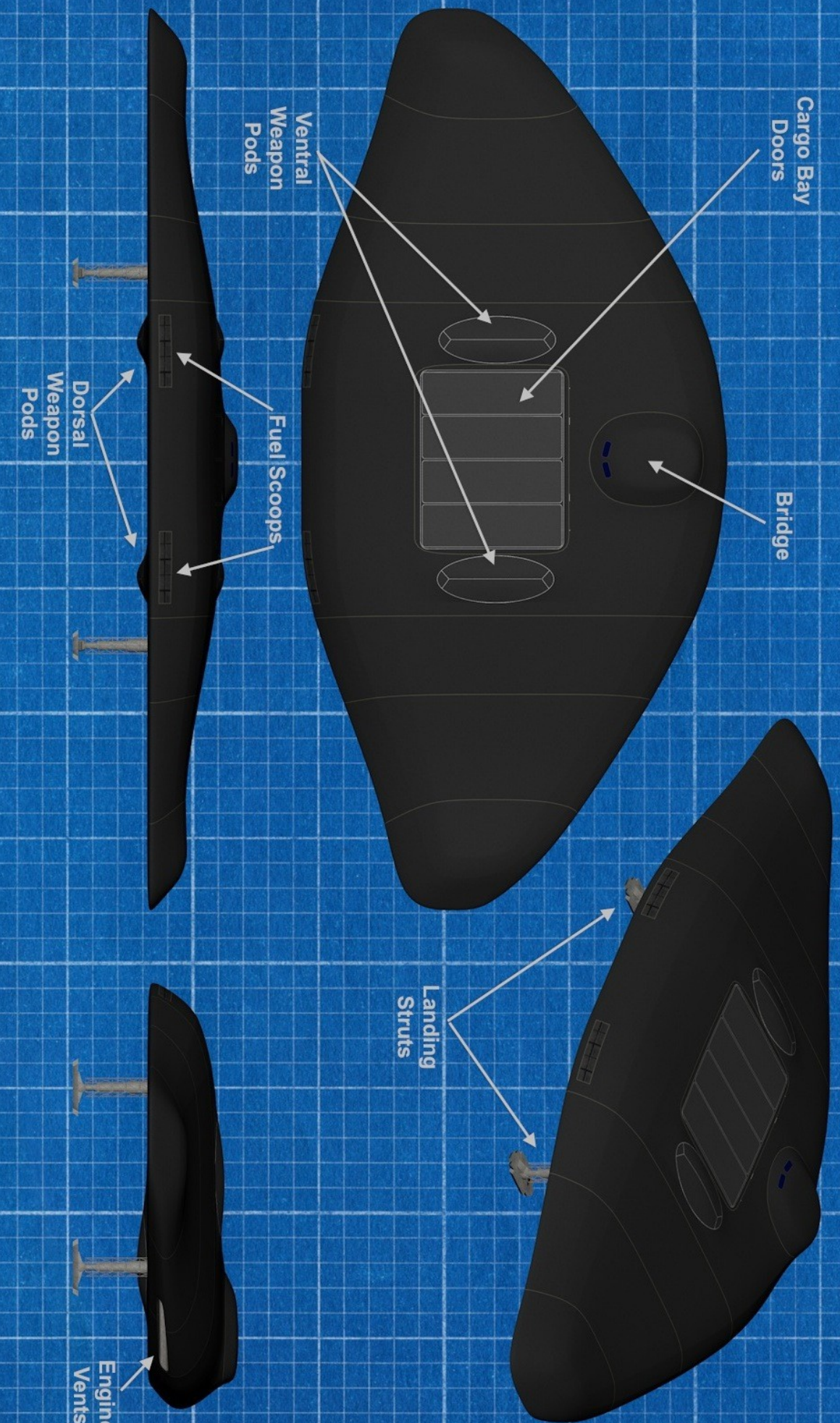
- 1) Bridge
- 2) Computer
- 3) Captains State Room
- 4) Library / Meeting Room
- 5) Avionics Bay
- 6) Ships Locker
- 7) Airlock
- 8) State Room
- 9) Galley
- 10) Common Room
- 11) Ventral Turret

- 12) Dorsal Turret
- 13) Fuel Processing Equipment
- 14) 30 Ton Module
- 15) Fusion Power Plant
- 16) Fuel Pumps
- 17) Engineering
- 18) Sick Bay
- 19) Jump Drive
- 20) Maneuver Drive
- 21) Landing Strut
- 22) Drop Tank Linkage

Lower Deck



LEGEND



APPARITION CLASS MULTIROLE DEEP INTRUDER BLOCK C (WRAITH)		TL	TONS	PRICE (M _{CR})
Hull (4) (400 tons)	8 structure 8 Hull			16
Streamlined	flying wing configuration, fuel scoops			1.6
Armor	bonded superdense (3 pts)	14	10	4
Self Sealing		9		4
Stealth Treatment	Enhanced Stealth (sensor penalty -8)	14		80
Maneuver Drive (M)	6 G	9	23	48
Jump Drive (H)	4 parsecs, fast cycle	13	45	88
Fusion Plant (M)	quad core reactor	12	37	96
Bridge	holographic controls	12	20	0.5
Computer (Model 5)	BIS, FIB (rating 25)	13		22.5
Sensors	military grade (very advanced) +2	12	5	4
State Rooms	4 single occupancy + captain's suite (5)	10	22	2.7
Emergency Low Berths	8 persons	10	2	0.2
Autodoc		12		0.4
Software Suite	Library, Maneuver, Jump Control 4 (20), Astrogation 3 (3), Fire Control (4), Intellect (1), Pilot (3), Steward (3), Auto Repair 1 (10), Sensors (3), Turret Gunner (3), Comm (3), Engineering Jump Drive (3), Engineering Power (3), Engineering Life Support (3), Engineering Electronics (3), Engineering Maneuver (3), Mechanic (3), Database (being stealthy) (3)			15.6
4 Triple Turrets			4	4
	2 x dual pulse laser + sand caster 2 x particle beam			10
Aft Bay: Library Suite			6	4.2
30 Ton VIP Module				5.6
	Cargo: 4 tons repair drones, 1 ton sand caster			1.05
Fuel Processors	120 tons (J4) in 25.5 hours		7.6	0.38
Internal Fuel Tanks	92 tons (Jump 2 + 12 tons)		92	
Modular Storage	120 tons with convert for fuel		120	4.8
Drop Tank Fittings	Supports 160 Tons of fuel		6.4	3.2
	12 tons of fuel runs it for 1 week at full capacity 12 tons of fuel runs it for 2 weeks at ½ capacity			
TOTAL	Includes 10% cost savings		400	375.06

Apparition Class By The Numbers

All customers involved with the Apparition line of ships are confidential. The information provided is for the Wraith, with permission from the customer to release her details.

The Wraith was selected to perform a combination of “high risk logistics support”, intelligence gathering, and VIP transport, the latter because the owner wished to travel in style. The customer wanted to be able to operate the Wraith with as small a crew as possible, and that crew had to function at peak performance for long periods of time between shore leave.

1. The Bridge

The bridge of the Wraith is slightly more elevated than the rest of the upper deck. This allows it to rise above the ventral surface of the craft providing the pilot with a sweeping view of space, and the vehicle.

Spacious and comfortable, when not in jump space, the bridge is usually dominated by whatever vista exists outside. The entire forward wall is a display surface normally tuned to the forward external pickups. Seamlessly hidden within are two actual windows allowing a serviceable, but limited, forward view by the crew in the event of a video systems failure. The forward viewport, like all windows on the Apparition class, provides protection from lasers, and will be opacified automatically if adverse external conditions are detected.

The rest of the bridge consists of clear, clean lines conforming to a minimalistic esthetic. There are few physical controls at each station, and each station is identical at first glance. The central work area is an exception as it provides optional redundant physical flight controls for piloting.

When an operator runs their hands over the surface of their workstation, biometric information is taken and, if authorized, holographic technology brings the space immediately surrounding them to life. Each station provides tactile, audio, and visual feedback while interacting with its holographic controls. Gravitic emitters in the console, in addition to vibratory movement in the acceleration couch, provide limited but effective tactile feedback. The panel and the acceleration couch both modulate the air, providing specialized audio feedback that is nullified outside the workstation. This prevents the alarms and comms traffic from distracting other operators. The trideo emitters provide the 3D visual control and display surfaces, intuitive to persons native to TL 10 and higher worlds. All of this makes it trivial for the operator to perform even very complex tasks.

While individual operators can and will customize their work stations, the Wraith's controls and displays build on hundreds of years of research to provide a near optimal configuration for each of the 6 standard ship functions. Any of the workstations on the bridge may be configured for one of the following roles:

1. Flight Control
2. Astrogation

3. Sensors Operation and Analysis
4. Communications
5. Engineering
6. Fire Control

The bridge is configured with 5 workstations, but the computer bay may be used as a 6th if necessary. In practice, the first 5 stations are set up on the bridge, and fire control can be performed in the turrets.

Access to the bridge is provided by a floor hatch at the rear. This hatch leads to the common area on the lower deck (10).

2. The Computer Bay

The Wraith boasts a TL 13 Model 5 main computer with a computational rating of 25 units. The computer is critical to the requirement that the Wraith be crewed with as few people as possible, and is meant to give her crew an advantage in almost everything they do. Because so much emphasis is placed on the central computer, the computer is hardened against electromagnetic pulses (EMP), and bolstered so that it can perform jump operations and still have computational power to support other ship functions (bis).

The Computer Bay is secured by a physical hatch, with only a small porthole through which to see the equipment inside. It is accessed with a passcode typed on a pad, fingerprints or voice command, and the scan of a personal ID card.

Inside, an acceleration couch may be raised from the floor. The holographic or physical controls may be used via the central interface core to perform any of the 6 ship's functions. This is the only location from which the computer can be significantly reconfigured, crew rosters altered, programs installed, etc.

3. The Captain's Suite

This suite provides the captain with a spacious and relaxing personal environment. It's separated into 4 distinct areas: the sitting room, office space, master bedroom, and refresher. All areas, with the exception of the refresher, have an excellent view of whatever vista is available outside the ship. The entire aft wall is transparent, though protected from laser fire, and, like the bridge viewport, can be opacified. This surface also serves as a display for both trideo and 2D information and entertainment.

The sitting room has space comfortable for entertaining 5 or so people. The chairs of the living space can also be moved to sit directly in front of the desk in the office area.

The office space allows the captain to work in the privacy of the suite. This works well, whether the captain is working with sensitive information, or speaking with one or two crew members privately. The desk is large enough for desktop or hand computers, as well as the usual allotments of flimsies, papers, and assorted office material.

The bedroom has a king-sized bed, lockers, and cabinets along one wall, a trunk at the foot of the bed, and additional under-the-bed storage. This provides plenty of room for

personal belongings.

The refresher is large enough for two people to use at once, and offers ultrasonic, overhead water, bathing, and spa capabilities.

4. Library (Customized Aft Bay)

The library provides a solid facility for both recreation and additional crew training. This includes three workstations linked to the local media storage, storage for physical volumes, expansive 2D and trideo viewing surfaces, seating for the mass viewing of these materials, and several tables for face-to-face classes/talks. A dedicated computer both tracks and provides media on-demand to the crew, and is also available to run training simulations and educational programs.

Like the Captain's Suite and similar to the bridge, this room is dominated by the extensive transparent wall, which can also be used as a 3D/2D control and display surface.

On other ships of the Apparition class, this space is dedicated to barracks, extra cargo, lab space, briefing room, VIP suite, or even a vault. See the options for more details.

5. Avionics Bays

These bays house the Wraith's powerful sensors. The Wraith was outfitted with an advanced TL 12 sensor package that includes, RADAR, LIDAR, densitometers, jammers, and Neural Activity Sensors (NAS). During most of the Wraith mission profiles, her sensors will be operating in passive mode. Even so, this package gives the Wraith long range visual and thermal capabilities over 50 km, EM detection capability up to 50 km, the ability to use other ships' active RADAR/LIDAR to discern information about the system (passive RADAR/LIDAR) and densitometry readings up to 10 km, and NAS up to 1250 km from a target, all without compromising its low probability of detection.

Just as important, if the ship is detected, its advanced sensor suite makes jamming targets much easier. Connections to the cargo bays are in place for future sensor expansion through additional 30-ton modules.

6. Ship's Locker

Entrance to the ship's locker requires a passcode and a brief bio scan. Inside are racks for weapons, lockers for emergency rations, shelving for spare parts, communications equipment, hangers for spare vacc suits, extra data crystals, etc.

7. Airlocks

Apparition class ships have three airlocks: one leading to the ventral wing surface, one leading to the dorsal wing surface, and one cargo airlock (forward-center on the lower deck).

The cargo airlock is 3 meters wide, and includes a ramp, which will unfold downward and extend to the ground. An Apparition class ship can sit as high as 10 meters off the

ground. The ramp is capable of extending that far, and supporting industrial class weights. External airlock doors are designed to seal seamlessly to the ship and are very difficult to discern or detect. When active, the ship's LPD systems will even prevent densitometers from locating them.

8. Staterooms

Staterooms on Apparition class ships are relatively small, but include an individual refresher for their occupants. Space is utilized very efficiently, even to the extent that wall, ceiling, and floor compartments are available for personal storage. On the Wraith these staterooms are meant for single occupancy and contain quality amenities suitable for high passengers, but the design does support double occupancy via bunks. A desk is provided along with a comfortable chair.

9. Galley

Crews on Apparition class ships are usually on extended deployments, sometimes for months on end. Research shows that in these situations, food becomes vital to their well-being and mission effectiveness, well beyond its nutritional value. To compensate for operational hardships, the galley is furnished with all the latest TL 12-14 culinary tools, making the preparation of sumptuous feasts easy and fun. Though small, the galley is extremely well laid out, allowing two people to work independently within. Additionally, the galley is open to the common area and includes a bar at which four people can sit (two on the right, two on the left).

10. Common Area

An Apparition class ship includes a spacious common room, featuring a floor to ceiling transparent aft wall. When in Jump Space or deployed in uninteresting stellar terrain the wall remains opacified, and serves as a 2D/trideo display surface. The crew can show vistas previously visited by the ship, or purchased in various entertainment packages. Likewise, movies and trideos may be displayed for the pleasure of the off-duty crew.

The large common area is roughly 12 meters by 5 meters. This room is always decorated to the tastes of the crew, but storage in the floor, as well as floor and ceiling based data/power hookups allow the room to change it's purpose relatively rapidly. Most common furnishings for this room include, couches and tables for socialization and stowable exercise stations for physical fitness.

Access to the bridge occurs through a ceiling hatch at the rear of the area. Extending a ladder is done by accessing a virtual keypad on the rear window, or manually pulling the emergency access lever under the floor (key required). Opening the hatch requires biometric authorization at the hatch itself.

11. Ventral Turret Access

Apparition class ships come with 4 triple turrets, 2 ventral and 2 dorsal. While the turrets are not “pop up”, their external apparatus are contained within a weapon pod . This sheath allows the exterior stealth technologies to cover the turrets. Normally these pods are obvious but smooth “bumps” in the surface of the ship. When a turrets is deployed, the pod splits open along its meridian and retracts. This reveals the weapon system and provides it the clearance to operate.

Areas marked 11 indicate the access way to the dorsal turrets. Turrets on Apparition class ships are modular, allowing for their complete removal and easy replacement. This is sometimes necessary when a mission requires a 30 ton modular payload including a weapon system larger than, or preferable to, what may be deployed in a turret.

A maintenance hatch allows technicians to maintain turret systems as well as gain access to the disconnects for the space. Disconnecting the services to a turret takes 10-60 seconds by a trained technician with a tool kit. Actually removing or replacing the turret takes 1-6 hours by a trained technician with the appropriate support equipment. Such equipment is readily available at a class B or better starport. Accessing this space is controlled and monitored in engineering.

12. Dorsal Turret Access

This area is identical to 11, except that it accesses a dorsal turret, and has space for sand caster storage.

13. Fuel Processing Equipment

The fuel processing equipment is entirely contained within the forward fuel baffles, just aft of the fuel scoops. The equipment here is able to process 120 tons worth of raw fuel into refined fuel over a 25 -hour period. Access to this equipment is through the forward access maintenance panels, which must be unlocked via a control in main engineering. Maintenance can only be done if the fuel is drained (or absent) from the forward baffle. Fuel can be readily pumped to any fuel space available including any of the cargo bay baffles if need be.

14. 30-Ton Cargo Bay

The cargo space within an Apparition class ship can be divided into a single 120-ton space, two 60-ton spaces, four 30-ton spaces, or any combination of 30-ton spaces and 60-ton spaces adding up to 120 tons. Each 30-ton bay has four iris valves to access it across two levels. Additionally each 30-ton space conforms to the 50-ton modular cutter standard for 30-ton payloads, allowing interoperability with the wealth of cutter modules available on the commercial market.

Each 30-ton bay section contains a control panel near the iris valves for control over both the fuel bladders and the exterior bay doors if needed. Please see the sections on bay doors, modular reconfigurable cargo bays, 30 ton and 60 ton modules for more details.

15. Fusion Power Plant

Apparition class ships have an oversized fusion power plant for their tonnage. This is required to support the 6G maneuver drive. Rather than a single large central fusion core, the Apparition class generates power through 4 smaller cores connected in parallel. The advantage of this is that, during periods of extended deployment, cores may be powered down to minimize fuel consumption. As cores come offline, maximum performance of the maneuver drive degrades. Other power-hungry systems, including bay weapons and particle beam turrets, are also affected.

As long as at least one core is running, it takes 1-6 minutes to power up additional cores. Cores do not have to be powered up one at a time, and can be powered up in parallel. However, because of safety and power stability concerns, cores do not provide additional power benefits until the power up process is completed.

During extremely long deployments, it's possible to run even one core in low power mode. Doing this greatly reduces fuel consumption, but has negative effects on the ship. First, not enough power is available to operate the ship and prime the additional cores quickly. Once set in the low power state, it takes additional cores 10-60 minutes to come up to speed. Second, power safety margins are maintained by minimizing draw for crew systems without compromising those systems. Lighting becomes dimmed, the internal temperature is decreased but tolerable, water and food takes longer to heat up, water pressure is reduced, display walls aren't as vibrant or true to life, non-essential computer interactions take more time, and minor smells build up.

Bringing additional cores online is normally done because there is an immediate need to consume increased amounts of energy. This is true when the ship uses its weapon systems, or increases its acceleration. Due to the non-linear power efficiency of fusion plants under these conditions, the immediate spike in fuel consumption is large, and the effect is as if the last week was spent at the higher power level. If there is not enough fuel available, the chief engineer will find the ship has only enough fuel left for 2-12 hours of operation.

Cores Running	Fuel Consumption (tons/week)	Max Thrust (G)	Max Bay Weapons	Type of Bay	Max # Particle Turrets
1 (low power)	1	1	0	None	0
1	2	1	0	None	1
2	6	3	1	Fusion, Missile, Particle, Rail Gun	2
3	9	4	2	Fusion, Missile, Particle, Rail Gun	2
4	12	6	3	Fusion, Missile, Particle, Rail Gun, Meson	4

16. Fuel Pumps

These pumps help shuttle the fuel to/from various fuel tanks including the variable fuel bladders in the cargo space, and external drop tanks. Access to these pumps is through access panels and can only occur when fuel is pumped out of the forward baffle as in area 13.

Each 30-ton cargo section has its own fuel pump for independent operation.

17. Engineering (A&B)

Engineering on an Apparition is broken into two identical spaces that operate as a single set of engineering systems. The two spaces are connected via infrastructure that runs between the decks. Each space features two workstations directly connected to critical ship systems including, the jump drive, the maneuver drive, the fusion power plant, the environmental cyclers, and maintenance subsystems. Each station can access and operate any engineering system. Normally, however, one console is focused on maneuver and environmental systems, while the other is focused on power generation and jump systems.

Though the workstations in engineering offer full 2D/3D display and control surfaces, they also feature a full set of physical gages, indicators, switches, dials, and other redundant lower tech mechanisms. This ensures the ability to control critical systems even if there is a failure in the main computer, a holo emitter, or 2D display. Additionally, if the bridge is not functional, the ship can be controlled completely from engineering, although doing so is somewhat more cumbersome and difficult.

18. Sick Bay

The Wraith has a sick bay complete with an autdoc to assist crew who become ill. Additionally, 8 emergency low berths occupy a significant chunk of the wall space, and are always available if needed. These low berths have independent fusion generators should main power go off line.

19. Jump Drive

Apparition class ships contain a TL 13 jump drive capable of traveling across four parsecs of space in a single jump. Like other critical systems, the jump drive has two separate cores that work in parallel to achieve this effect. Access to the cores is fairly cramped in places, but engineers or drones are able to get to any desired spot for repairs/maintenance.

The jump drive and the fusion plant have parallel access to fuel storage, giving both complete access to all the fuel.

20. Maneuver Drive

The bulk of the aft engineering space is taken up by the Wraith's extraordinary maneuver drive. Able to bring the fully loaded Apparition class cleanly up to 6Gs of thrust, this monster mechanism powers dozens of thruster plates strategically placed about the entire hull to give the Wraith not only speed, but agility.

Apparition class ships are fully capable of vertical take off and landing (VTOL) and prefer this method as standard operating procedure. As with the other drives on the ship, the maneuver drive is split into two functional engines working together in parallel.

21. Landing Struts

When landing on a planet with any amount of gravity, landing struts must be deployed. The landing struts are large hydraulic extenders that unfold from their storage cavities to support the ship anywhere from 1 meter to a maximum of 12 meters off the ground.

The positioning of the landing struts allows complete access to the cargo bays. By design the ship's center of gravity is near the center of the ship on the lower deck.

22. Drop Tank Linkage

Pumps and linkage control nodes allow drop tanks to be mounted to either the ventral or dorsal side of the ship. Proper drop tank mounting maintains clearance down the center of both the top and bottom of the ship, to allow the cargo bay doors to open without impediment. Using drop tanks significantly changes the profile of the ship, and, unless specially modified (and very expensive) drop tanks are used, completely negates any positive effect from the LPD subsystems. The drop tank linkages, in addition to allowing mechanical coupling and fuel access, have additional hookups for power, environmental systems and the like for future expansion.



APPARITION CLASS MULTIROLE DEEP INTRUDER BLOCK A (BASIC CONFIGURATION)		TL	TONS	PRICE (M _{CR})
Hull (4) (400 tons)	8 structure 8 hull			16
Streamlined	flying wing configuration, fuel scoops			6
Armor	2 pts	14	6.68	2.67
Self Sealing				4
Stealth Treatment				40
Maneuver Drive (M)	6 G	9	23	48
Jump Drive (H)	4 parsecs, fast cycle	13	45	88
Fusion Plant (M)	quad core reactor		37	96
Bridge		12	20	0
Computer (Model 4)	(rating 20, sufficient for Jump 4 Control)	12		5
Sensors	military grade (very advanced) +2	12	5	4
State Rooms	4 single occupancy + Captain's Suite (5)		22	2.7
Emergency Low Berths	8 Persons		2	0.2
Software Suite	Library, Maneuver, Jump Control 4 (20)			0.4
4 Triple Turrets			4	4
	2 x (2 pulse lasers + 1 sand caster), 2 Empty			2.5
Sand Caster Storage	20 rounds		1	0.25
Customizable Aft Bay	Unfitted space which is usually customized per ship. See options.		6	
Fuel Processors	120 tons (J4) in 24 hours		8	0.4
Internal Fuel Tanks	92 tons (Jump 2 + 1 week of operations)		92	
Modular Storage	120 reconfigurable modular tons, with embedded collapsible fuel bladders for conversion to fuel tanks. Ventral and Dorsal cargo bay doors.		120	5.6
Drop Tank Fittings	165 Tons of fuel, fitted for either/both ventral/dorsal attachment		6.6	3.3
	12 tons of fuel runs it for 1 week at full capacity 12 tons of fuel runs it for 2 weeks at ½ capacity			
TOTAL	Includes 10% discount		398.28	296.12

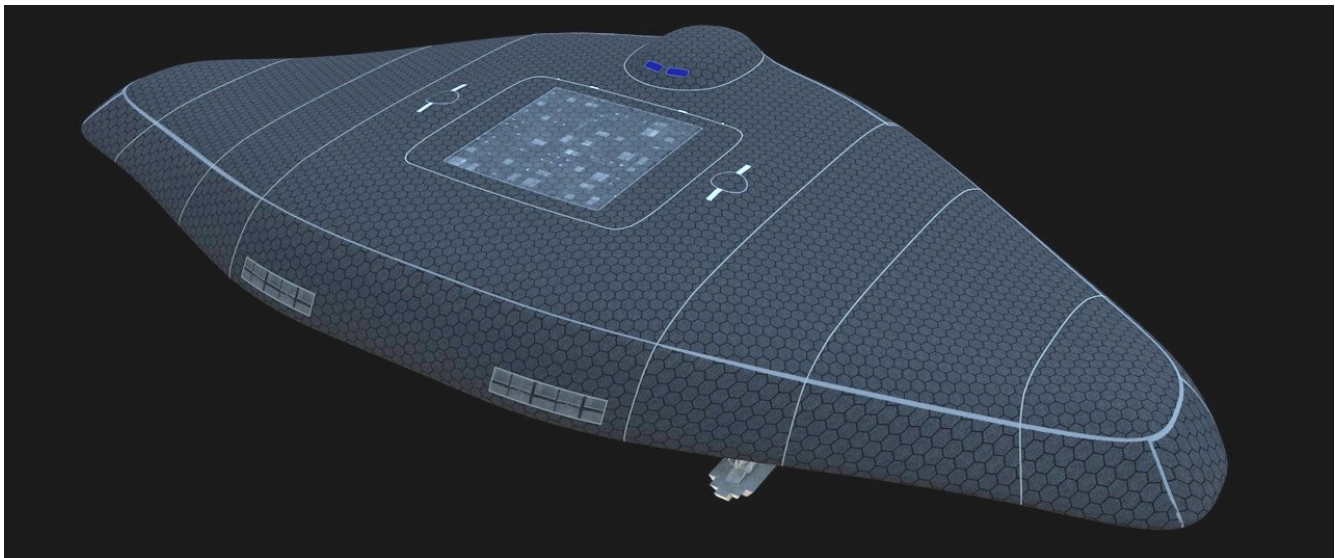
Options, Modules, and Equipment

Stealth Upgrades

Like armor and weapons, there is a high tech cat and mouse game between stealth and detection technologies. These upgrades are applied to the existing stealth technologies and lower the probability of detection thus increasing the stealthiness of the vessel.

Upgrade	TL	Required Software	Cost (Mcr)	Tons	Sensor Penalty
Improved Stealth	12	Stealth Control/5	0.05 Mcr/ hull ton	1	-2 *
Enhanced Stealth	14	Stealth Control/10	0.10 Mcr/hull ton	0	-4 *

* stacks with TL 11 stealth coating (Traveller Main Rulebook p. 106)



Improved Stealth

(TL 12, 2 ton, additional MCr. 0.050/ton of hull)

Improved stealth enhances the traditional stealth coating by providing anti-masking measures through deployment of active emitter elements across all hull surface area.

So-called “masking” or “silhouetting” methods of detection are ways of detecting a stealthy ship by picking up its absence against some background illuminator, natural or otherwise. Typically these are the hardest to employ, but also the hardest to defend against. Examples of this include using highly sensitive visual sensors to detect the absence of a star field, or causing several ships to emit large amounts of EM radiation, and looking for a dark or attenuated spot within the emission area.

To defend against this, a hull wrapping, containing millions of TL 12 trideo emission cells, is added underneath a specialized stealth coating that allows them to operate. These cells are similar to what is used in visi-light armor and 3D displays. They are able to redirect and transmit multiple

wavelengths of light simultaneously from multiple viewing angles. This actually allows the vessel to transmit environmental EM signals “through” its space, manipulate its thermal signature, and ensure that it doesn't interrupt its background visual field. All of this provides no reference for an enemy to get a footing on.

There are still limitations. The ship's computer must run specialized software (which comes with the option), and 1 ton of control hardware must be installed.

Enhanced Stealth

(TL 14, 0 tons, additional MCr. 0.08/ton of hull)

As Improved, but the active emitters are blended with the stealth coating, the specialized control hardware is no longer needed, but more powerful software is required.

Vehicle Stealth in Real Life- Thermal Camouflage

In 2011 BAE Systems came public with their ADAPTIV active camouflage system. The system utilizes hundreds of 5.5” wide hexagonal panels that are able to rapidly heat and cool similar to the way a pixel is able to rapidly change colors. The panels cover the vehicle and create a thermal display surface that can “play back” the ambient background of the vehicle effectively cloaking it to thermal sensors. Alternatively, they can “play back” thermal images of other objects, such as rocks, cars, cows, and even images the crew have recorded in the field. This allows them to hide in plain sight.

Originally meant for deployment on infantry fighting vehicles, BAE is working on versions for helicopters, and ships. In it's present form, the system can operate both while the vehicle is at rest or on the move, and is said to reduce detectability to less than 500 meters.

Variant Aft Configurations

Area (4) is a 6-ton section of the Apparition upper deck. Different owners customize this area to the specific purposes of their Apparition. However, this is not a modular area, and once dedicated to a purpose, it takes an expansive and lengthy overhaul at a class B starport facility or better to repurpose. Therefore, the configuration of this area will be core to the main purpose of the ship. Below are some of the options. Please refer to High Guard and Vehicle Supplements 5 and 6 for the details of how each module affects game play.

Library Suite

More expansive than a standard library this is a resource for study and aid for training and a significant repository of knowledge. It can even provide entertainment for extended missions. The suite contains an autonomous computer system, 3 large personal workstations, an area for multi-student material viewing, several group work tables, and a transparent interactive viewing surface that sweeps the entire length of the library. This is a natural place to hold databases on many different topics.

Laboratory

Excellent for field lab work, when materials and situations studied or work performed would raise too many unwanted questions, or when the nearest friendly lab is too far away. This facility has been deployed for industrial and military espionage, as well as incident investigations, such as crime scene and failure analysis.

Ground Tactics Center

This includes a briefing room and armory. The briefing room contains the additional computer equipment and comms access necessary to become an ops center during a mission. This is very useful in preplanning missions and ensuring good execution. It also includes an armory capable of equipping 1 elite unit of 5 battle dress, or 10 normal soldiers, or 50 members of the ship's crew with weapons, armor, and mission tech. This works well in conjunction with a standard 30-ton passenger module, which can carry a team of people.

Arsenal

This provides storage for up to 20 soldiers' worth of gear, armor, weapons, and ammunition. This number is reduced to 10 when utilizing battle dress. It also includes a 2-ton vehicle bay with access to the exterior of the ship. The vehicle bay is capable of holding 2 dtons' (27 m³) worth of vehicle. Six Grav Cycles, or an additional 6 battle dress with grav belts are common complements for the space. The bay has access to the exterior of the ship and acts as an airlock.

The Arsenal is useful when utilizing standard 30-ton passenger modules. While these modules are excellent for carrying soldiers, they would normally require modification to securely store military gear.

Micro-Vault

This space becomes a small, reinforced vault, storing up to 2 tons of critical material that absolutely must survive. This could be an especially valuable passenger in a low berth or computer systems filled with important data. The mini-vault has another 2 hull and 2 structure points. The cost of this space also includes an emergency jettison system, to eject the vault if required.

Comm and Sensor Upgrade

In conjunction with the 5 tons of allocated sensors in the forward avionics compartments, this space can contain an additional 4 tons for sensor upgrades, and enhanced comms. This converts the advanced sensor suite into a countermeasure suite with the enhanced sensor option, and adds one Meson Communicator with 10,000 km range. The meson communicator enhancement allows the ship to communicate with a very low probability of detection, and no probability of interception, perfect for the ship's stealthy profile.

VIP Suite

This space offers well-appointed accommodations for a single very important person. These accommodations include a sauna/hot tub/fresher unit, a room to entertain privately in, and a bedroom with spacious closets and a king-sized bed. The rooms also feature an extensive entertainment library and console and a micro galley, and come with a personal servitor designed and programmed to taste.

Additional Crew Space

This can be used to spaciouly house up to 2 additional crew members, or bunk up to 6 military style.

Vehicle Bay

This bay holds up to 6 tons (60-80 m³) of vehicle. It works as a large airlock and has access to the exterior of the ship.

Other Options

Stealth Jump Drive

A stealth jump drive is a natural fit for an Apparition, but its cost is frequently prohibitive to the customer set. However, the design team did manage to figure out how to put one together. Vetted under field conditions, the design isn't as expensive as some, but it is effective.

Stealth Drop Tank

These drop tanks have a capacity of 160 tons of fuel and are coated with the same material that assists the Apparition with its stealth. Just like the Apparition, these tanks can be coated with higher tech, more stealthy material. See "Stealth Upgrades" p. 26

Apparition Upgrade Options

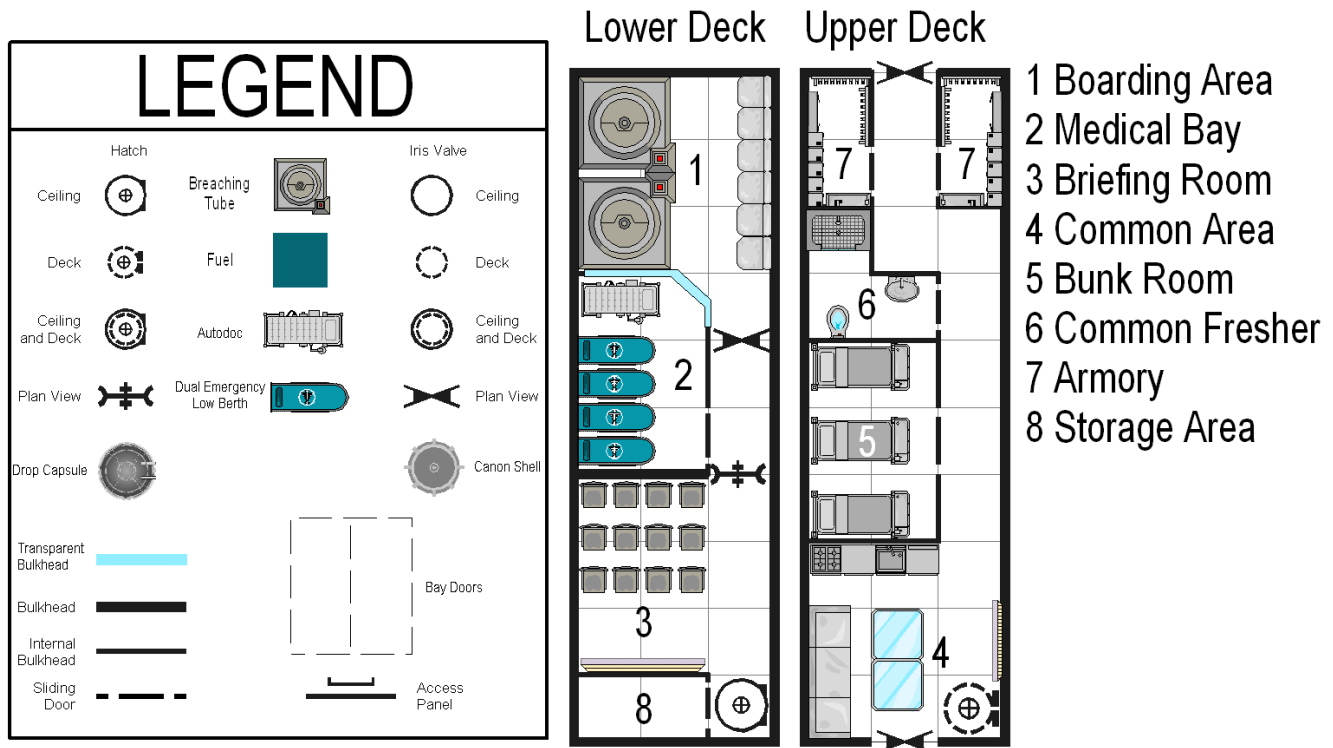
Component	Notes	TL	Placement	Tons	Price (Mcr)
Library Suite	Spacious library with common viewing area, and segregate study sections.	12	Replaces area (4)	6	4.00
Micro-Vault	Contains 3 tons of critical material that must survive even the destruction of the Apparition. Can be ejected in an emergency. Vault contains 2 extra structure and 2 extra hull.	14	Replaces area (4)	6	3.30
Laboratory	Spacious and well equiped laboratory, capable of holding an additional 2 tons of specimens, or 2 isolation chambers.	12	Replaces area (4)	6	1.00
Ground Tactics Center	Provides a briefing room and weapon, armor, and equipment storage for up to 5 battle dress, or 10 soldiers , or 50 normal crew.	10	Replaces area (4)	6	1.00
Sensor + Comms Upgrade	Upgrade sensors to a countermeasures suite with enhanced signal processing, & 10,000km range meson communicator	13	Replaces area (4)	6	20.00
VIP suite	Luxury suite for a single individual	15	Replaces area (4)	6	1.00
Arsenal	Provide storage and equipment for up to 20 soldiers, or 10 with battle dress. Includes weapons, armor, munitions and even a small vehicle bay (2 tons).	10	Replaces area (4)	6	1.00
Additional Crew	Spacious Accomodations for 2, or bunk room for 6.	10	Replaces area (4)	6	0.75
Vehicle Bay	Room for a Grav Raft, Grav Utility Vehide, Grav Assault Vehicle, or other vehicle up to 6 tons..	9	Replaces area (4)	6	0.50
Stealth Jump Drive	Installs shielding around the drive, and dampners along the jump grid.	12	Add to jump drive	0	40.00
Stealth Drop Tank 160 tons	Basic Stealth (upgrades may be applied at additional cost)	11	External	0	17.60
Basic Stealth Database	Successful consultation (int/edu-computer, routine) adds +1 to int/edu skills used in stealth task chain	11	in computer	0	0.01
Advance Stealth Database	Successful consultation (int/edu-computer, routine) adds +2 to int/edu skills used in stealth task chain	14	in computer	0	0.1

All prices are deltas to the base cost

30-Ton Modules

Modules are the quickest and easiest way to reconfigure an Apparition for a different role. The 50-ton modular cutter has provided great utility for as long as anyone can remember. The investment in a single cutter, provides the owner a platform for a wide variety of missions. Configuration of a cutter happens by swapping in different 30-ton modules. Some of the most commonly available modules, are for cargo handling, passenger service, ATV transport, and fuel skimming. However, 50-ton modular cutters are also a favorite of colonial navies, mercenary groups, and corporate interests. Over the years, each of these has developed its own modules for use in the ubiquitous 50-ton cutter. Because all of these modules share the same power, water, data, life support, and mechanical interfaces, they can easily be integrated into an Apparition. Presented here are some of the modules that are of particular utility.

Boarding Module



“If you need to put boots on somebody else's deck in less time then it took me to say this to you, you need a boarding module. If the folks on the other side are happy to see you, that's called an insertion. If they'd rather you stayed in bed that day, we call that an intrusion.” - Sargent Koontz

The boarding module allows for rapid force insertion onto space faring vessels. It contains two breaching tubes, a medical bay, briefing room, and accommodations for 6 people.

The boarding area (1) is an environmentally sealed compartment with two breaching tubes and ready space for a boarding team. Armored glass provides a full view of the boarding operations from

the medical bay (2) so that medical personal can readily assess a situation as wounded are being brought on board.

The medical bay (2) is well equipped, has a TL 12 autodoc, 8 emergency low births for patients who must be immediately triaged, and anything a trained surgeon needs to perform a life saving TL 12 operation. Occasionally, when a breaching tube is damaged, the boarding area can decompress. The hallway outside of the medical bay is designed to be used as an airlock in this situation.

The briefing area (3) is used both to prepare for a boarding mission and to debrief the boarding team and any new passengers the module might have acquired after the boarding mission is complete. It's also used as an operations center during the boarding, but the computers, comms, and sensor gear to perform that duty must be brought on board by the crew. This material is typically stored in the cargo hold (8) until set up just before the operation commences. To protect against hostile intruders to the module, the bulkhead and hatch separating the boarding area from the rest of the module are reinforced, and there are no external exits off the module from the lower deck. As an extra precaution, the armory is located on the upper deck.

The common area is spacious and contains a small galley sufficient to support the crew for a month before replenishment is necessary. Sleeping accommodations are provided as a set of three double bunks (5) with a large locker at the foot of each one. The locker has two separate compartments, each sufficient to hold the personal belongings of one individual. The crew share a spacious refresher (6).

Finally the module contains one complete armory capable of holding the weaponry, armor, and other gear required by the boarding crew.

Operations less dangerous (or less worried about safety) commonly replace the medical bay with facilities to support another 2 crew members.

Boarding modules are used to render emergency assistance to disabled or damaged ships, for ship salvage (sometimes proactively), and for hostile boarding operations.

Boarding Module

Component	Notes	TL	Rating	Tons	Price (Mcr)
30 ton Module Hull		10			1.30
3 State rooms	double occupancy	10		12	1.50
Armoury		10		2	0.50
2 Breaching Tubes		10		6	6.00
Briefing Room		10		4	0.50
Medical Bay		12		4	0.50
8 Emergency Low Berths	2 tons contained in medical bay	12		0	0.20
	Autodoc, and two resupplies	12			0.24
Cargo Space	2 tons of additional gear			2	
TOTAL				30	10.74

Boarding Module Options *Tonnage and price are the deltas from the module above*

Component	Notes	TL	Rating	Tons	Price (Mcr)
Module Stealth Coating	-4 DM to detection and lock sensor rolls, Traveller Core Rulebook p. 106	11			3.00
Enhanced Stealth	-6 DM to detection, includes Model 1 computer, and basic stealth coating	12	5	1	4.53
Improved Stealth	-8 DM to detection, includes Model 2 computer, and basic stealth coating	14	10	0	6.16
Additional Autodoc resupply					0.10
Additional Crew	Medical Bay is removed in leu of Apparition's facilities. Additional stateroom added supporting 2 additional module crew.	11		0	-0.44

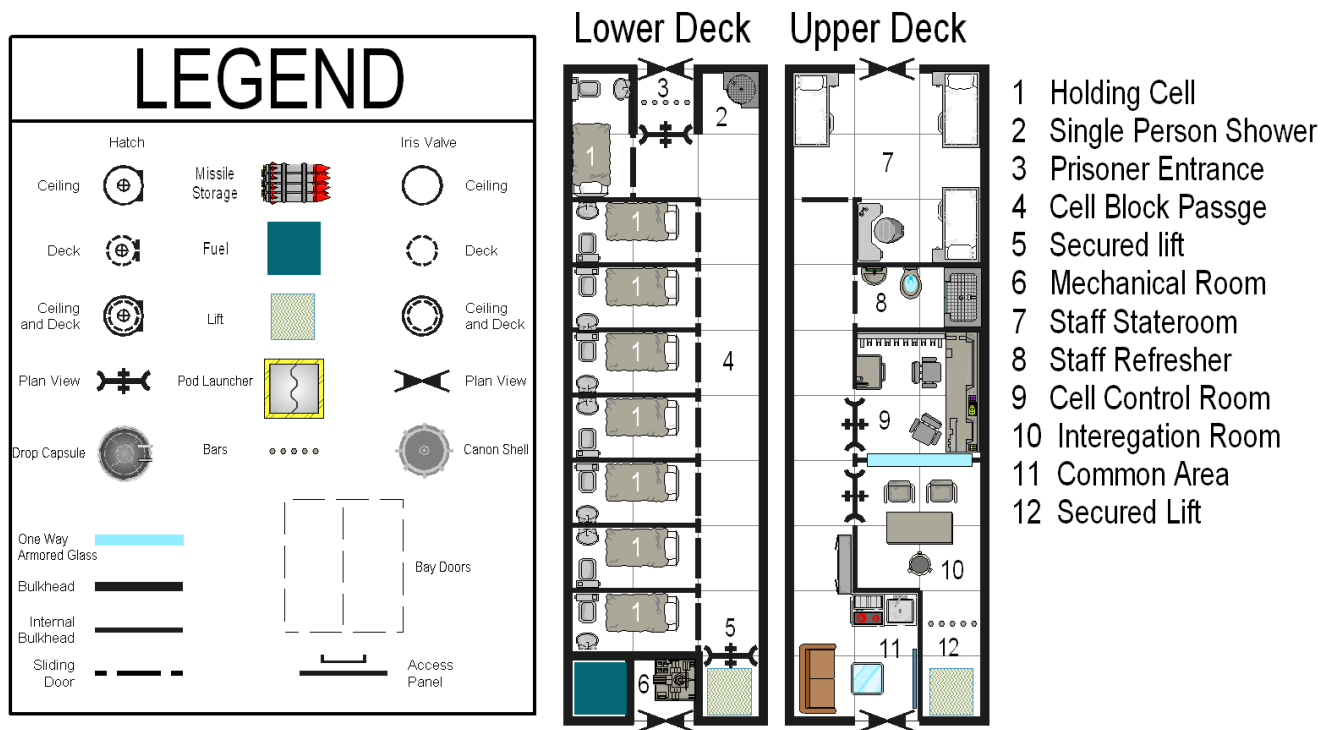
Role on Apparition Class

Because of the lack of atmosphere, shadows in space are absolute. Under the right circumstances, a well piloted Apparition can close to adjacent distance of a starship, starport, or other space going vessel, without detection, or combat. Additionally, an Apparition can use its advanced sensors to jam the target (sensors and comms) so that while they may know something is out there, they have no idea where or how close it is. While this may be done on approach, this is almost always done on departure, making it difficult for the target to engage in combat or follow, and equally difficult for them to alert the authorities or obtain assistance.

The boarding module allows for the insertion of forces onto a target before that target can adequately respond. While rapidly burning through a starship's airlock will generate alarms, accessing a disused and dormant hanger on a massive space station may not. This allows for snatch and grab missions, sabotage, and sometimes even covert access.

When utilized on an Apparition, the boarding module can be modified to replace the med bay with the briefing area, and the old briefing area retooled to support two additional crew (Additional Crew). During boarding operations, Apparition medical staff may be in the boarding area to treat the wounded; the worst cases would be brought to the Apparition's medical bay for extended treatment.

Detention Transport Module (DTM)



The Detention Transport Module (DTM) is a convenient and inexpensive way to secure prisoners. Its uses include dealing with prisoners of war, who must get from the battle field to more capable intelligence centers for debriefing and the transit of prisoners from jump ships to prison facilities. In some polities, groups of these make for "quick and dirty" prisons.

The lower deck is the cellblock. Each cell is roughly identical, containing only a single bed and minimal fresher facilities. The floor, walls, and ceiling are a contiguous piece of material, with no obvious seams, screws, or catches, save for the seals around the door. Even the bed is part of this material, apparently extruded from the wall as a simple plank onto which bedding has been applied. Light translucently originates from behind this material. Gas exchange occurs through a vent consisting of hundreds of fine holes across a half-meter square on the ceiling. A portion of the material over the sink is reflective, providing a simple mirror. Each cell contains a camera, usually behind the mirror (which functions as one-way glass).

There is only one personal cleaning station for the entire floor. Depending on the nature of the prisoners being held, access to this is usually done by cycling one prisoner out of a room at a time.

Most prisoners enter through area 3. The entire environment, including the lighting, the iris valves, the bars, the hatches, the cell doors, the air, the lift, and even the use of the personal cleaning station can be controlled from the cell control room on the upper deck. Many modules also include keypads, ID readers, and/or biometric devices at each of these to allow for on-the-spot usage by authorized individuals. The lift through the locked hatch is the only way to access the upper level from the cellblock. There are usually obvious cameras in areas 2, 3, 4, and 5.

The upper level contains the interrogation room, which also doubles as the medical bay when patients need to be treated. Prisoners' access to this room is via the lift and through the bars in area 12. The hatch to this room is always locked when a prisoner occupies it. One-way armored glass separates this space from the Cell Control Room.

The Cell Control Room contains the main panel providing access to all module systems, facilities, and especially the cameras. It also acts as the armory providing a gun rack, and a secured locker. Under standard operating procedure this room is locked, with someone manning it at all times, when the cellblock is populated.

The crew's accommodations are much more spacious than the prisoners', containing 3 double bunks, plenty of personal storage space beneath each, and a desk for shared use. There is a modest common area complete with a small galley. A hatch under the couch allows access to the independent power supply and fuel.

The DTM is capable of autonomous operation for one week, if required. Extended or continual use normally sees the interrogation room reconfigured (either temporarily or permanently) to serve as a recreation area for the prisoners. Finally, a cell can be emptied and its contents replaced with two commercial-grade low berths. (There are hookups in each cell if one knows where to look and has the right tools).

Detention Transport Module

Component	Notes	TL	Rating	Tons	Price (Mcr)
30 Ton Hull		10	s3		1.3
3 Staterooms	Crew Living Quarters (double occupancy)	10		12	1.5
4 Staterooms	Holding Cells (double occupancy)	10		16	2
Fusion Plant			sB	1.5	3.5
Fuel	1 week independent operation			0.5	
Computer	Model 2	10	10		0.16
Monitoring Devices	Continuous monitoring of audio, video, bioscan, and EM cell emanations in every cell. Cameras in 2,3,4,5,10,12	13			0.01
Antipersonell Scanners	located in 3 & 12, scan for any hidden inorganic material	10			0.02
Trank Gas Dispenser & Gas	Can flood any space in the module	9			0.01
TOTAL				30	5.70

Detention Transport Module Options

Tonnage and price are the deltas from the module above

Component	Notes	TL	Rating	Tons	Price (Mcr)
Module Stealth Coating	-4 DM to detection and lock sensor rolls, Traveller Core Rulebook p. 106	11			3.00
Enhanced Stealth	-6 DM to detection, includes Model 1 computer, and basic stealth coating	12	5	1	4.53
Improved Stealth	-8 DM to detection, includes Model 2 computer, and basic stealth coating	14	10	0	6.16
Recreation Lounge	convert area 10 for recreation, includes entertainment systems, physical exercise devices, etc				0.2
2 Low Berths	replacing a single cell with 2 commercial grade low berths				0.1

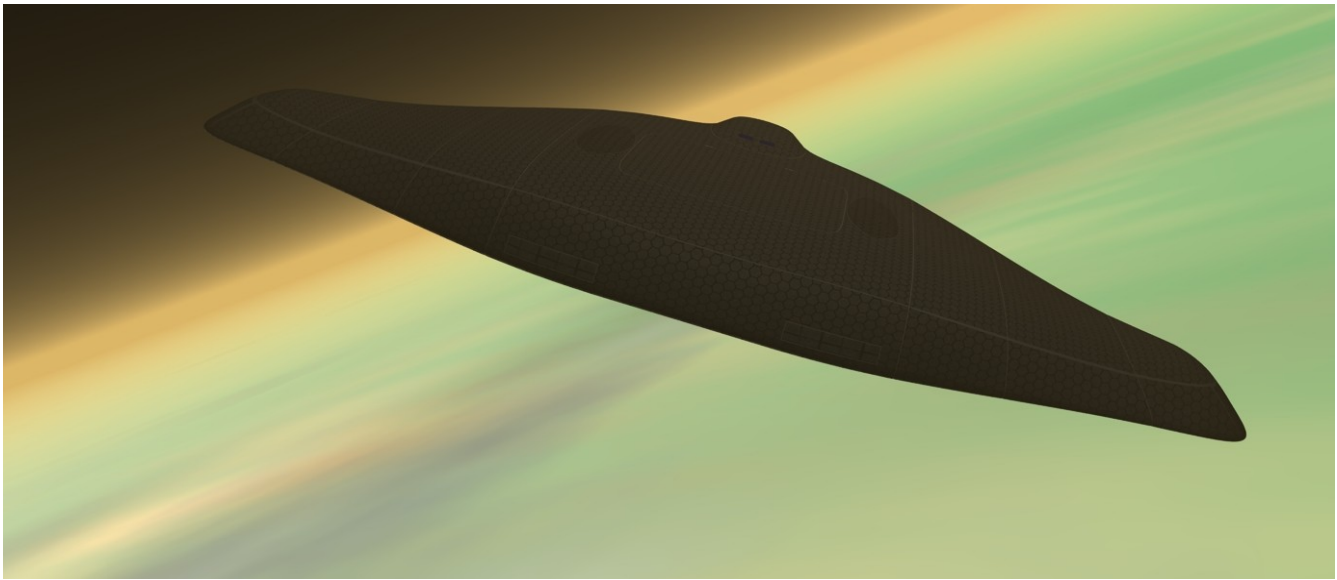
Role on Apparition Class

When fitted with a DTM, an Apparition becomes the ideal way to hold and transport high value prisoners invisibly. It can be used as an extremely high security prison that continually and quietly moves from place to place (making it almost impossible to break into).

It can even operate unobserved in hostile territory.

When it is used in conjunction with an Orbital Support Module, (and possibly an Orbital Insertion Module), prisoners can be proactively obtained and questioned. Finally, because the module has an independent power system and fuel supply, it can be used as a giant 30-ton life pod. To do this, the module is ejected into space where it is likely to be found (either by normal system traffic, or as a covert drop off). It can then be picked up by a standard 50-ton module cutter, a 1-ton docking clamp, or any ship with a bay big enough to engulf it.

Orbital Insertion Module (OIM)



Orbital Insertion Module

Sidebar: First Drop

Private Robert Billings, Rob to his friends, looked at his drop pod. He was expecting an egg, but the thing had more of a teardrop shape to it. Maybe it was a different model. Whatever.

His brother's first jump had been off a 10,000-ton Imperial cruiser. Rob had heard the story at every holiday since, and loved it. She was flying the emperor's banner high as the marines took the planet below. Everybody in the family loved it. That was half the reason he'd found these guys and signed up. It was just Rob's luck his first time was going to be jumping off of some mystery ship. They'd said he didn't even have the clearance to know its name. Worse than that, he was sequestered in what looked suspiciously like the same 30-ton Orbital Insertion Module he'd trained in. It was like riding a bike with training wheels. Where was the story in that?

He'd proved himself again and again in basic. He was a natural pick for this deployment, the recruit with the greatest talent for sure. When he found out his first real mission was a special op with an orbital drop, well he'd been more than thrilled, he was absolutely beaming. Then he was told to pack his gear and report to the tarmac. Sitting there, was something that looked more like a shuttle than a starship. It was a black smudge against a dark night sky. The flat, wing shaped thing, was MUCH smaller than he'd expected. He thought maybe he was being transferred to another ship, maybe a bigger ship. He knew the Leviticus was in the system. She definitely had drop tubes, and she was 30,000 tons!

It didn't take long for him to discover that the smudge wasn't a ticket to his next ride; it was the ride. Four weeks' worth of travel later it was hard to hide his disappointment from his fellow squad mates. The briefing told him very little except that they were going someplace to get something and if everything went well he would do absolutely nothing. If it went wrong, his job was to start shooting things.

There wasn't going to be anything worth talking to the family about. He couldn't stand it, and kept pestering Sergeant Koontz for more details. She had pretty much gotten tired of hearing him grumble and had taken to giving him extra training as busy work. He'd already aced the course back in basic, but as ordered he went over and over the vids.

"Are you going to get in, or are you waiting for it to date you first?" Sergeant Koontz's heavy voice was misplaced on a woman of her build. She was a full foot shorter than his six feet.

"I'm on it, Sarge." replied Rob.

Open already, the capsule's single "cozy" seat seemed to stare at him. The harness was still in its shipping plastic, and it had that new car scent. Grabbing the overhead handle, he spun himself around, and climbed in. Despite the pod's different outward appearance, the controls looked the same as in the training vid. Strapping in, he switched from main power to internal, then double checked the power pack, oxygen, and grav unit status. Piece a cake.

"Sarge, can you tell me again why the cruiser couldn't make this drop?"

Everyone groaned.

Sergeant Koontz, stepped up to the pod. She had made it clear that no one was to seal before she checked, no matter if they had had 100 drops, or none. The only thing worse than riding a bike with training wheels was having your mother futz with you before you went. He half expected her to spit her finger and use it to wipe something off his face.

"Fine, I guess now, you have a need to know. Son, you are 10 parsecs on the unhappy side of the front. The Leviticus can bloody a lot of noses, but it would be nothing more than a torn shred of good intentions by now. There are so many bogies between here and base, you'd think the sensor board was running a screen saver. "

Rob's face lit up. Now THAT was a story you could tell the family.

Sergeant Koontz raised an eyebrow. "What? That cheer you up. You better keep yer brain focused. Nobody else here is thinking about that, and 30 seconds from now, you won't either. When I push this button, that launcher 'ill spit you out so fast, you'll be munchin' yer nutz. Once you choke them back down, the only thing screamin' louder than you is your highly complex, very overworked grav unit built by some mouth breather on a world you never heard of by the company who could cut the most corners."

The sergeant, made a thorough inspection of Rob's harness.

"The only thing you have on the way down, is gravity, guts, and god." She tightened one of Rob's straps, then flicked the switch on the grav unit. It chimed, almost happily, and came online.

"To tell ya the truth...most of the time god ain't lookin." Satisfied with the inspection, the sergeant sealed the capsule up. The internal light flickered on, and the small status board came to life.

Rob didn't say anything, but his face must of held his growing fear because the sergeant sighed, almost taking pity on him.

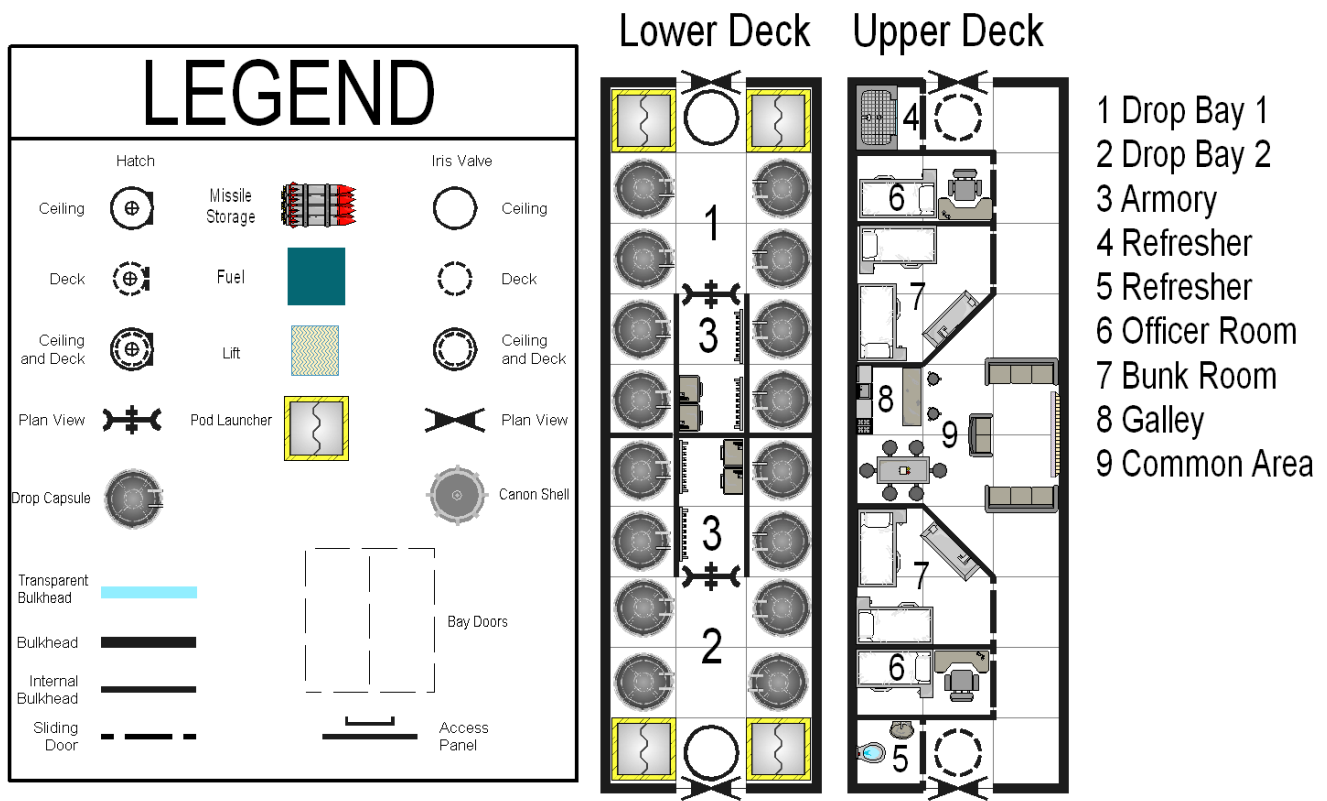
"Look, I'll let you give me a slow three count after you say your ready, OK?"

Rob nodded a couple times. With deep seriousness the sergeant looked Rob in the eyes.

"You'll be fine, private. The people down there ain't expecting you. Trust your teammates, they know what their doing."

Rob nodded with some amount of thankfulness. The pod shook, and the conveyer moved it to the launcher. He felt the dull thud of a snug fit.

*Rob steadied himself and thought "I trained for this. I can do this."
 "Ready Sarge!...One..." Rob's stomach turned itself inside out as the pod launched*



with violent speed.

The Orbital Insertion Module (OIM) is a mainstay of many mercenaries and colonial navies. It provides the capability to transit 16 people to a drop zone, equip them for their mission, and rapidly put boots on the ground without conducting landing operations.

Though variants exist, a standard OIM equips four jump capsule launchers, 16 capsules, and a complete armory. It also provides room for 18 people on short trips, or comfortable accommodations for 8 people on extended journeys.

The extended accommodations provide rooms for two teams of four. The bunk rooms contain a double bunk, a single bed, and a locker with enough room for four people's things. The officer's room contains a single bunk, with storage under the bed, and a private work area for reviewing mission material. The common room is an open space featuring a reasonably capable galley, group mess area, and recreation area.

The drop deck contains two independent launch areas, each with two launchers, eight jump capsules, and an armory. Each armory provides easy storage and access to 5 soldiers' worth of gear, including weapons, armor, and mission equipment.

Standard operating procedure is to split the 16 passengers into four teams of four. The first two teams descend to the drop deck, equip in the armory and then board the first 8 jump capsules simultaneously. Once in their capsules, the conveyers move the first 4 capsules on

to launchers, and a second group of two teams hits the armory and begins gearing up. As jump capsules are launched, the conveyers advance and new capsules are exposed for boarding.

The launchers can function independently or simultaneously. They may be operated by the standard controls within each pod, or manually at the launchers themselves. Cycle time is only 30 seconds between launches. This means that 8 well-trained personnel can be planet bound within 30 seconds of reaching the drop zone, and 16 before 90 seconds, minimizing the transit ship's exposure.

Role on Apparition Class

An OIM is a natural fit for an Apparition class ship. The Apparition provides stealthy delivery to the drop point, and when equipped with advanced or high survivability jump capsules, the OIM provides silent ground force insertion. The crew facilities of the module not only provide housing and gear storage for the insertion team, but, if desired, an easy way to segregate the ops team from the starship crew. This ensures that mission details have no opportunity to be shared by the crew in either direction.

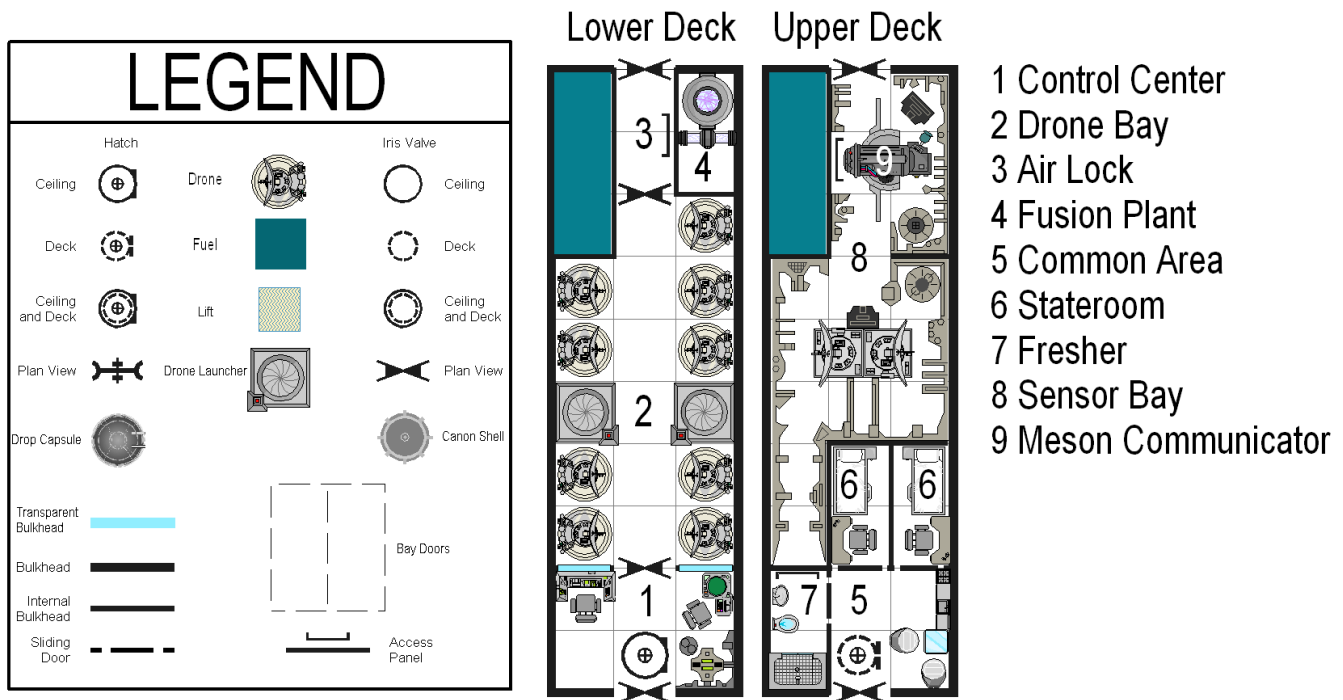
Orbital Insertion Module

Component	Notes	TL	Rating	Tons	Price (Mcr)
30 ton Module Hull		10	s3		1.30
4 State Rooms	double occupancy	10		16	2.00
2 Armories	1 Armoury per drop bay	10		4	0.50
2 Jump Capsule Launchers	Each can store 1 capsule	10		2	0.02
Storage for 16 Jump Capsules	seperated into 2 bays of 8			8	
TOTAL				30	3.82

Orbital Insertion Module Options

Component	Notes	TL	Rating	Tons	Price (Mcr)
Module Stealth Coating	-4 DM to detection and lock sensor rolls, Traveller Core Rulebook p. 106	11			3.00
Enhanced Stealth	-6 DM to detection, includes Model 1 computer, and basic stealth coating, displaces two jump capsules.	12	5	1	4.53
Improved Stealth	-8 DM to detection, includes Model 2 computer, and basic stealth coating	14	10	0	6.16
Standard Jump Capsule	-2 DM to detection and lock sensor rolls. Also called drop capsule.	10		0.5	0.01
Advanced Jump Capsule	-4 DM to detection and lock sensor rolls. Also called drop capsule. Carries ECM gear.	12		0.5	0.05
High Survivability Jump Capsule	-6 DM to detection and lock sensor rolls. Also called drop capsule. Carries ECM gear and decoys.	14		0.5	0.10

SENSCOM Module



The SENS COM module provides advanced communications, sensors, and Electronic Countermeasure (ECM) capability. It does this through 7 tons of sensor and sensor processing equipment, a meson communicator, and a flexible drone bay. SENS COM is short for sensor communicator.

The drone bay (2) stores and launches up to 7 tons of drones and satellites. These remote devices are operated via the control center (1) and monitored through the sensor bay (8). The bay can deploy probe drones (thereby acting as planetary survey sensors) or it can launch NAVSATs, short term COMSATs, survey satellites, and even combat drones.

All operations are performed via the control center, which mounts a very capable model 4 computer system. The computer system can automate tasks, which would normally require additional crew.

The living area consists of two small staterooms (6), galley, common area (5), and fresher (7). The staterooms contain one comfortable bed, a desk, and enough storage for one person's belongings. Each stateroom has access to the module's network, and it isn't unheard of for personnel to utilize the computer for entertainment during off hours.

A unique feature of the SENS COM module is its meson communicator (9). It provides for secure communications with no probability of interception and low probability of detection. Its 10,000 km range allows the module to be in high orbit and still communicate with the surface.

The module carries an independent fusion plant and enough fuel for 6 weeks of continuous operations. Its airlock (3) means that it may be deployed external to a craft for

independent operations.

SENSCOM Module

Component	Notes	Rating	Tons	Price (Mcr)
30 ton Module Hull				1.3
Stateroom	double occupancy		4	0.5
Drone Bay	as survey sensors without the sensor suite		5	6
Drone Storage			3.5	0
Countermeasures Suite	provides the advanced sensors needed for the drone bay and improved ECM capability	+2 sensor rolls, +4 ECM	7	6
Enhanced Signal Processing			2	8
Meson Communicator		10,000 KM range	1	6
Fusion Plant		sB	1.5	3.5
Fuel	6 weeks of fuel		3	
Ops Center			2	
Computer	Model 4 (Library, Intellect 10)	20	0	5
Airlock			1	1
TOTAL			30	37.3

SENSCOM Module Options *Tonnage and price are the deltas from the module above*

Component	Notes	Rating	Tons	Price (Mcr)
Module Stealth Coating	-4 DM to detection and lock sensor rolls, Traveller Core Rulebook p. 106	-4 to detect and lock on		3
Enhanced Stealth	-6 DM to detection, includes Model 1 computer, and basic stealth coating, displaces 2 weeks of module fuel.	-6 to detect and lock on		4.53
Improved Stealth	-8 DM to detection, includes Model 2 computer, and basic stealth coating	-8 to detect and lock on		6.16
ECM Drones	deployed to create false echos, and em bursts, subtracts effect of task chain [edu+sensors, difficult] + [int+remote operations, average] from sensor rolls to detect or lock onto Apparition.	- task chain effect to detect and lock on	0.5	0.12
Major Sensor Upgrade	Drone bay removed, airlock removed, countermeasure suite removed. Apparition ship upgraded to military countermeasures and enhanced sensors.	+4 sensor rolls, +6 for ECM		23
Command Upgrade	Countermeasure suite & airlock removed. Apparition ship upgraded to enhanced sensors, briefing room added, and 1 additional ton added for drone storage.	+4 sensor rolls		2.5
More Crew	Fuel supply and fusion plant removed. Additional crew quarters for 2 people added + 0.5 tons of cargo	+4 sensor rolls, +6 for ECM		-3

Role on Apparition Class

One of the largest drawbacks of being a stealth ship is that using active sensors makes the ship easier to find. The SENS.COM module can deploy remote, low cost, active sensors, in the form of drones. While the drones may be located, they transmit their data back to the SENS.COM module quietly via tight beam laser, or meson communicator, allowing the Apparition to maintain its stealth.

Another option is to use the module to deploy decoys and ECM drones, each one making it more difficult for the Apparition to be found.

Additionally, because the SENS.COM module can operate autonomously, the whole unit may be deployed remotely. The module can sit in orbit, communicating with its drones, or

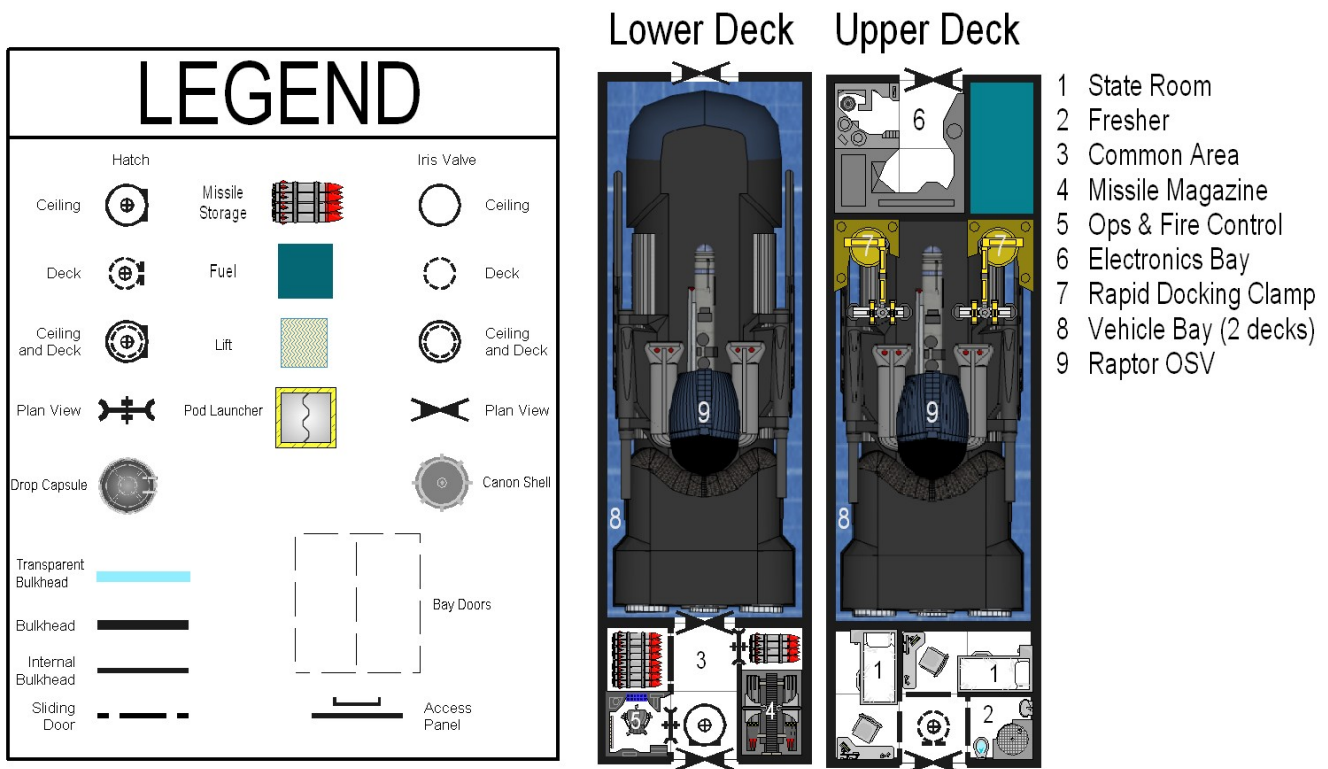
utilizing its own sensors safely out of harm's way, all the while feeding its data back to the Apparition quietly. The module could also be deployed in an asteroid field, on a moon, or on a mountaintop to serve as the anchor point in a base of operations for the Apparition.

If the SENSOCOM module is to be kept within the Apparition, it can provide sweeping sensor improvements (Major Sensor Upgrade). The drone bay and countermeasure suites may be removed and the space used to upgrade the Apparition to Enhanced Sensors and a Military Countermeasure suite.

Alternatively, the drone bay may be kept, and the advanced countermeasure removed and replaced with an enhanced sensor upgrade for the Apparition, a briefing room, and more drone storage. (Command Upgrade).

Finally, the fuel supply and fusion plant may be removed and replaced with additional lodging for 2 crew. (More Crew)

Orbital Support Module



The orbital support module's (OSM) primary mission is to transport personnel quickly and safely to and from the surface. Its secondary mission is to support those forces, both in transit and on the ground through orbit. The module consists of a 20-ton vehicle bay, double missile turret, sensors, comms, missile storage, and living quarters for a crew of 2.

The OSM provides adequate, if not spacious, accommodations for 2 individuals, a pilot and gunner/sensor operator. (1) Each state room contains a bed, desk, and enough storage for one person's belongings.

The common area (3) houses a small galley, but is frequently co-opted as a larger ops facility, augmenting room (5). This room may be atmosphere isolated from the rest of the living area allowing it to serve as an emergency airlock to the vehicle bay, should the need arise. The galley, however, isn't rated for 0 atmosphere, and will become damaged if used in this way.

The vehicle bay houses an Orbital Support Vehicle (OSV), the purpose of which is to provide transport to and from orbit safely. It's an open space extending from the lower deck to the upper deck. A key feature of the bay is its Rapid Docking Clamps. These robotic arms latch to a vehicle's hull and reduce the time it takes (10-60 minutes) to disembark or dock by one increment (1-6 minutes). The clamps are automated through the module's computer and intellect program. They may also be manually controlled via the ops and turret control room (5), or an authorized hand computer on the network.

An umbilical connects the OSV to module power, data, and the fuel reserve, and is designed to break away for rapid launching. One ton of additional fuel is provided for the OSV. This typically allows for 2 additional refuels and for a total of 10 days of operation.

The module utilizes military grade sensors to obtain situational awareness, and to communicate with the OSV and ground forces (6). These sensors provide an ability to jam hostile weapon, sensor, and comm systems, should the need arise. Operation of the sensor suite is done in the Ops & Turret Control room (5), or via an authorized hand computer on the module network.

The triple missile turret (4) is controlled via the Ops & Turret Control room (5). Because the module carries only 12 missiles, they are held in reserve for when they will make the greatest difference in the transport process. The missiles are a great way to break a ground siege, or provide targets other than the OSV for hostiles to shoot at. Additionally, decoy and chaff missiles assist the OSV if it's been detected.

Orbital Support Module

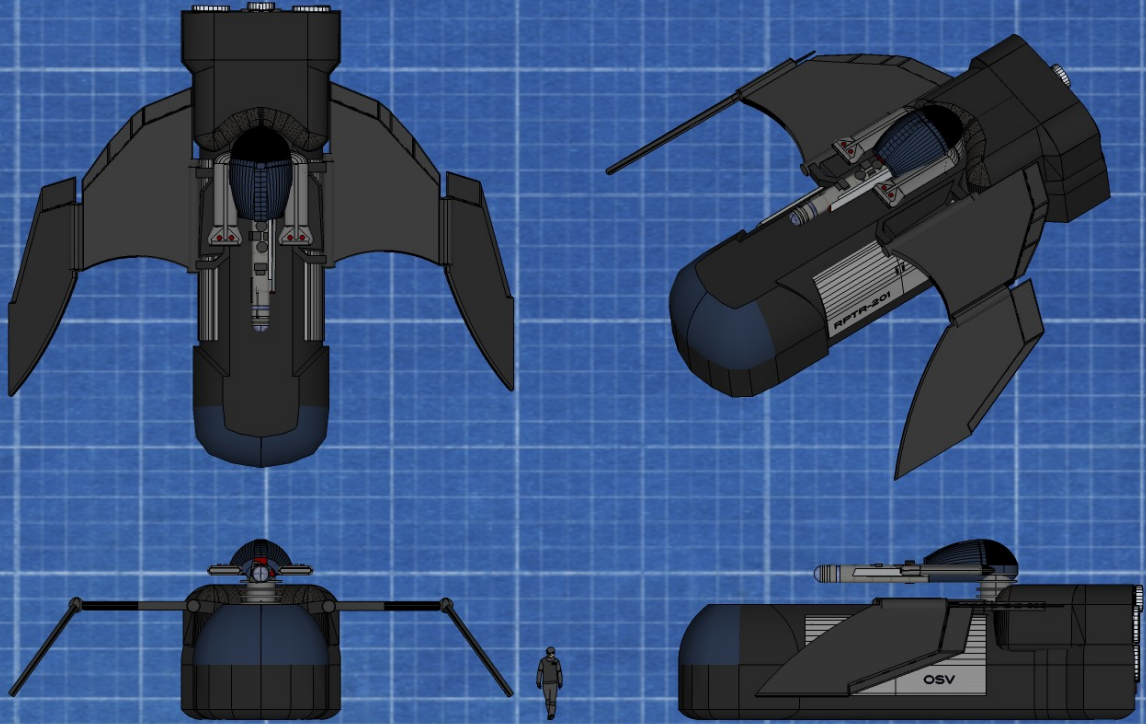
Component	Notes	TL	Rating	Tons	Price (Mcr)
30 ton hull					1.3
Missile Rack		6			1.5
Double Turret		8		1	0.5
Missiles	12 smart missiles	8		1	0.03
Stateroom	double occupancy	10		4	
Fuel	one additional week OSV duration			1	
Sensors/Comms	RADAR, LIDAR, Jammers	10		2	1
Rapid Docking Clamp	special purpose docking clamp	9		1	0.5
Computer	Model 2	9	10		0.16
Software	Intelect 2	13	2		0.05
	Docking/3	13	3		0.1
OSV Vehicle Bay				20	5.14
TOTAL				30	7.48

Orbital Support Module Options

Tonnage and price are the deltas from the module above

Component	Notes	TL	Rating	Tons	Price (Mcr)
Module Stealth Coating	-4 DM to detection and lock sensor rolls, Traveller Core Rulebook p. 106	11	-4 to detect and lock on		3
Enhanced Stealth	-6 DM to detection, includes Model 1 computer, and basic stealth coating, displaces 2 weeks of module fuel.	12	-6 to detect and lock on		4.53
Improved Stealth	-8 DM to detection, includes Model 2 computer, and basic stealth coating	14	-8 to detect and lock on		6.16
Improved Sensor & Comms	Sensor/Comms removed from module, Apparition advanced comms upgraded with improved signal processing (High Guard p. 45), 1000KM (good to low orbit) Meson Communicator added.	15	Apparition +4 to sensor tasks, 1000 km Meson Comms Range	0.6	2
Enhanced Sensors	Sensor/Comms removed from module, Apparition advanced comms upgraded with enhanced signal processing (High Guard p. 45)	13	Apparition +6 to sensor tasks		7
Additional Missiles	Apparition houses crew. Crew space is converted in to storage for 48 additional missiles.	11			-0.5
Sensors Expert Software	Allows computer to automate, or assist in the interpretation and ECM activities of the module.	13	3		0.1

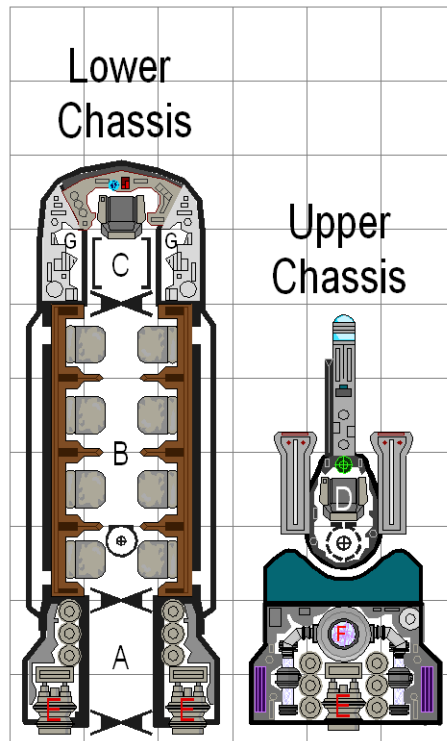
RAPTOR OSV



GULL WING CONFIGURATION

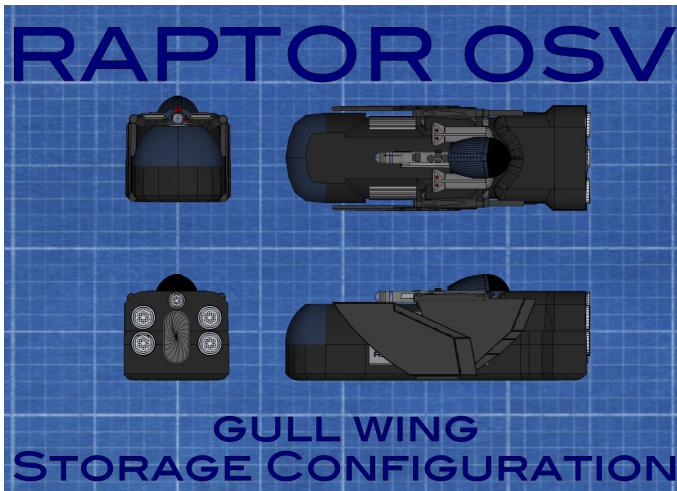
LEGEND

Hatch	Missile Storage	Iris Valve	
Ceiling	Fuel	Ceiling	
Deck	Lift	Deck	
Ceiling and Deck	Pod Launcher	Ceiling and Deck	
Plan View		Plan View	
Drop Capsule		Canon Shell	
Transparent Bulkhead			
Bulkhead		Bay Doors	
Internal Bulkhead		Access Panel	
Sliding Door			



- A Airlock
- B Cabin
- C Cockpit
- D Tripple Turret
- E Maneuver Drive
- F Power Plant
- G Avionics

The OSV depicted in the floor plan is a 20-ton Raptor. The bulk of the Raptor sits in the lower deck with some mechanical systems and the turret rising up to the upper deck. Its central airlock allows easy boarding through the common room (3). Immediately through the airlock (A) is the cabin (B), capable of holding up to 8 tons of cargo, or 8 people snugly in jump seats. Both walls of the cabin are sliding hatches. These hatches can be rapidly opened or closed to allow an entire team to board or exit at once. The snug cockpit (C) contains maintenance panels to access the ship's avionics (G) and space for a single pilot. Access to the Raptor's triple turret (D) is through the ceiling hatch at the rear of its cabin. The maneuver drive (E) and power plant (F) are meant to be accessed from the exterior of the craft.



The Raptor is optimized for atmospheric flight and sports gull-like wings that fold up when docked. Unfolded, each wing is 7 meters long, hinged at the attachment point, and middle. Because the wing is armored (like the rest of the vehicle), a favorite tactic of Raptor pilots is to bring the ship to a hover over their landing zone, and partially retract the wings, offering cover to the side doors. The extreme maneuverability provided by the wings makes the Raptor a serious opponent in atmospheric dog fights.

Raptors are treated with a stealth coating, allowing them to quietly slip into and out of tough situations, but lack the ECM and jamming gear for extended black ops work. Their pulse laser gives them reasonable offensive capability against light fighter cover, and the PGMP's offer considerable anti-personnel support. All together, the Raptor is a package that works well for its role.

One variant of the Raptor removes the gull-like wings and adds a military sensor and comms suite with basic ECM capability.



Raptor OSV

Component	Notes	TL	Rating	Tons	Price (Mcr)
20 ton Hull	S2				1.2
Streamlined				0	1.5
Armor	Crystaliron	10	2 pts	0.5	0.24
stealth	-4 to sensor to locate or lock	11		0	2
Grave Plates	sE	10	5g	2.5	4
Fusion	sE	10		2.4	5
Fuel	3 days duration			0.5	
Cabin	8 cramped passengers in jump seats/8 tons of cargo			8	0.4
Airlock		10		1	0.02
Cockpit	Single Pilot	10		1.5	0.1
Pulse Laser		7			0.25
2 PGMPs	12d6 (Auto 6)	14			0.2
Tripple Turet	PGMP, Pulse Laser, PGMP	9		1	0.06
Aerofins	+2 to maneuver in atmorspher, folding gull wings	10		2	0.02
Standard Electronics	RADAR, LIDAR -4 to defend against jamming				
TOTAL				19.4	14.99

Raptor OSV options

Component	Notes	TL	Rating	Tons	Price (Mcr)
Improved Stealth	-8 DM to detection, includes Model 2 computer, and basic stealth coating	-8 to detect and lock on	-8 to detect and lock on	0	6.16
Meson Communicator	1000KM (good to low orbit), can't be jammed.	15	1000 km	0.6	2
Basic Millitary Comms & Sensors	Wings are removed, coasts are the deltas, no longer at -4 to defend against jamming, or +2 to flight.	10		0	0.98

Role on Apparition Class

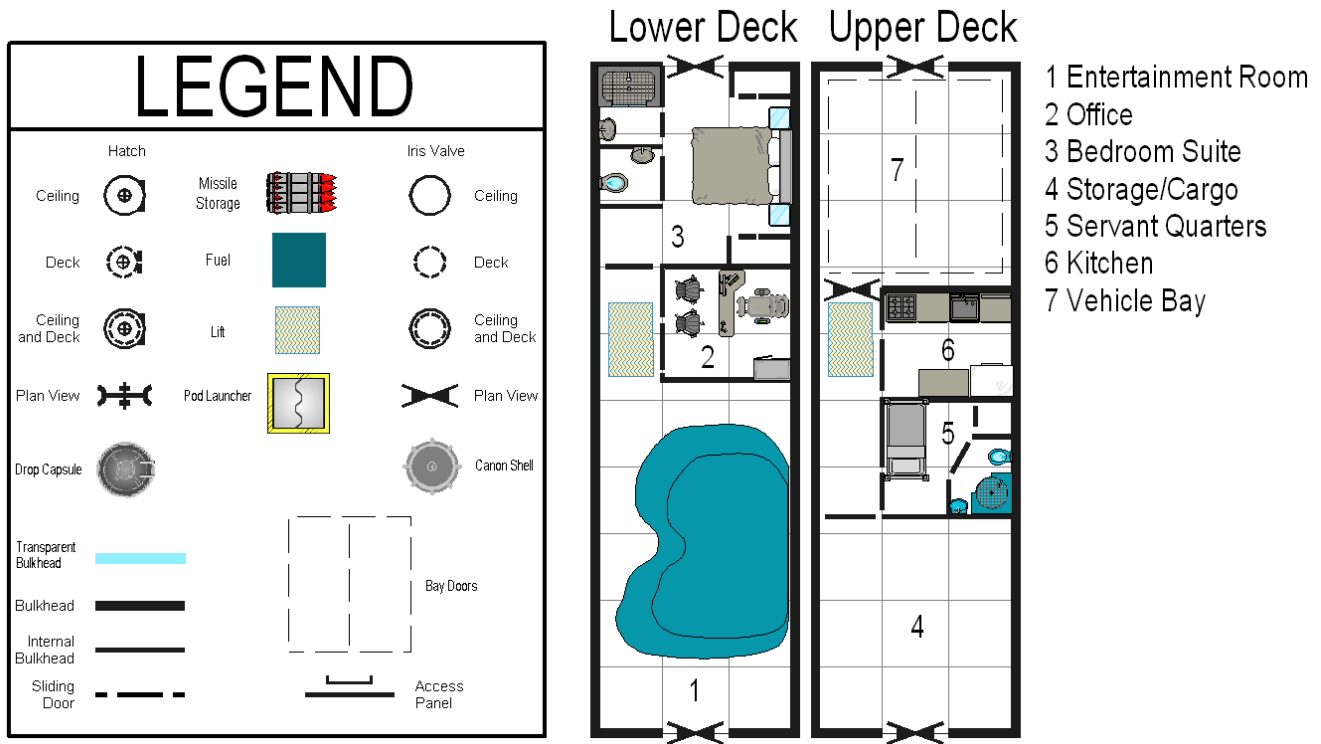
A few modifications to the standard OSM go a long way to boosting the mission capabilities of an Apparition.

The module's 2-ton sensor bay normally holds a standard military electronics suite. On an Apparition, this system is replaced with hardware providing either improved signal processing and a mason communicator (Improved Sensor & Comms) or enhanced signal processing (Enhanced Comms). Likewise the Raptor adds a mason communicator. In this way, the Apparition can provide the Raptor with current situational awareness from its own superior sensors via a mason link, with a very low probability of detection and no chance of interception. This greatly increases the Raptor's stealth profile. If ECM is needed, the Apparition can provide it from orbit.

Finally, if the Apparition class is configured to provide staterooms for the module's crew, that module's crew space may be converted to additional missile storage (Additional Missiles). Alternatively, the Apparition may provide additional missile storage directly. This provides inexpensive yet lethal orbital support. Ground-based forward observers can be deployed and retrieved via the Raptor to significantly enhance strike effectiveness.

Onboard an Apparition class, the OSM can work in conjunction with an Orbital Insertion Module (OIM) to provide both rapid deployment and retrieval capabilities. This frees the Apparition to sit quietly in orbit, mere minutes away from 100 diameter limit at all times.

VIP Module



The Very Important Person (VIP) module dedicates 30-tons to the pleasures and well being of single individual or couple. It allows the very wealthy, or the very important to travel with every amenity, and every need met.

The lower deck is primarily where the VIP lives, works and plays. The center of this revolves around the entertainment room (1). The entertainment room is multipurpose and easily reconfigured to serve as a banquet hall, club, exercise gym, trideo theater, or natatorium.

It features a 4 meter by 6 meter luxury pool. This pool has independent TL 14 temperature regulators, filter, water, gravitic, lighting, and holographic systems. Using these, the pool is able to emulate, a gentle aquamarine tropical sea cove, a fresh water river rapid, or even a single standing "surfing" wave that lasts for as long as it's occupant can stay atop it. The pool can provide a spa experience, including various scents and water textures which can be added as desired. The bottom of the pool is actually a transparent display surface which can, in conjunction with the pool's trideo emitters, create the illusion of any desired underwater terrain. Most popular, however, is the ability to de-opacify the pool's bottom, open the bay doors beneath the module, and simply swim amongst the stars.

When not in use, the pool can be covered at the touch of a button. This allows it to be treated like any of the other flooring in the room. This covering, like the pools bottom, has variable opacity. Frequently, suite owners will leave the flooring transparent in order reveal something below. Some suite owners also use the pool to keep aquatic pets.

Beyond the pool, the entertainment room has top of the line sound, and visualization systems built in. Each wall, and the ceiling are photo realistic display surfaces, and the sound technology allows for the creation of autonomous “sound scapes” throughout the space.

The suite also has a well equipped and comfortable office (2). Furnished with it's own TL 14 computer, and decorated to taste, the room facilitates small meetings, and whatever administrative, financial, political, or creative work the suite owner wishes to accomplish. The room uses the modules data and comms network to allow the owner to communicate via the ships electronics systems as needed. Ultimate control of exterior communication remains the larger ships responsibility.

The lower deck completes itself with the owner's master bedroom suite (3). This suite includes an enormous bed, a large closet, a small and private spa, and a personal fresher.

The upper deck is mostly reserved for the staff, and support functions of the module. It contains the 5-ton storage room (4). This room holds the personal possessions of the suite own, including whatever furnishings are desired for the entertainment rooms various functions.

Quarters for 2 staff members are provided in a single stateroom set up for double occupation (5). The room contains a set of bunk beds, a modest closet, and a private fresher.

The galley (6) is the central hub for activity on this deck. Well appointed, this facility allows a master chef to prepare scrumptious food. It can serve an individual or cater a formal occasion for 20 with ease.

Finally, the VIP module comes complete with a private vehicle bay (7). Measuring larger than 4.5m x 4.5m the vehicle bay is capable of holding about 60 m³ worth of private transportation. Two large bay doors expose this room to the exterior of the ship. The entire space acts as an airlock. Typically, a VIP may have a luxury grav car, grav racer, or a grav SUV here. Occasionally these will also be treated with various stealth technologies.

VIP Module

Component	Notes	TL	Rating	Tons	Price (Mcr)
30 Ton Hull		10			1.3
Cargo Space		10		5	
Vehicle Bay	See options below	12		5	0
Private Apartment		12		4	1.1
Work Area		12		2	0.2
Servant's Quarters		10		4	0.5
Kitchen		12		2	0.2
The Grand Room		14		8	1.8
TOTAL				30	5.10

VIP Module Options

Component	Notes	TL	Rating	Tons	Price (Mcr)
Module Stealth Coating	-4 DM to detection and lock sensor rolls, Traveller Core Rulebook p. 106	11	-4 to detect and lock on		3
Enhanced Stealth	-6 DM to detection, includes Model 1 computer, and basic stealth coating, displaces 2 weeks of module fuel.	12	-6 to detect and lock on		4.53
Improved Stealth	-8 DM to detection, includes Model 2 computer, and basic stealth coating	14	-8 to detect and lock on		6.16
Gravitic Racer	Supplement 5 Civilian Vehicle p. 59	10		0.25	0.09
Gravitic Car	Supplement 5 Civilian Vehicle p. 58	12		0.6	0.26
Gravitic Utility Vehicle	Supplement 5 Civilian Vehicle p. 61	10		0.89	0.33

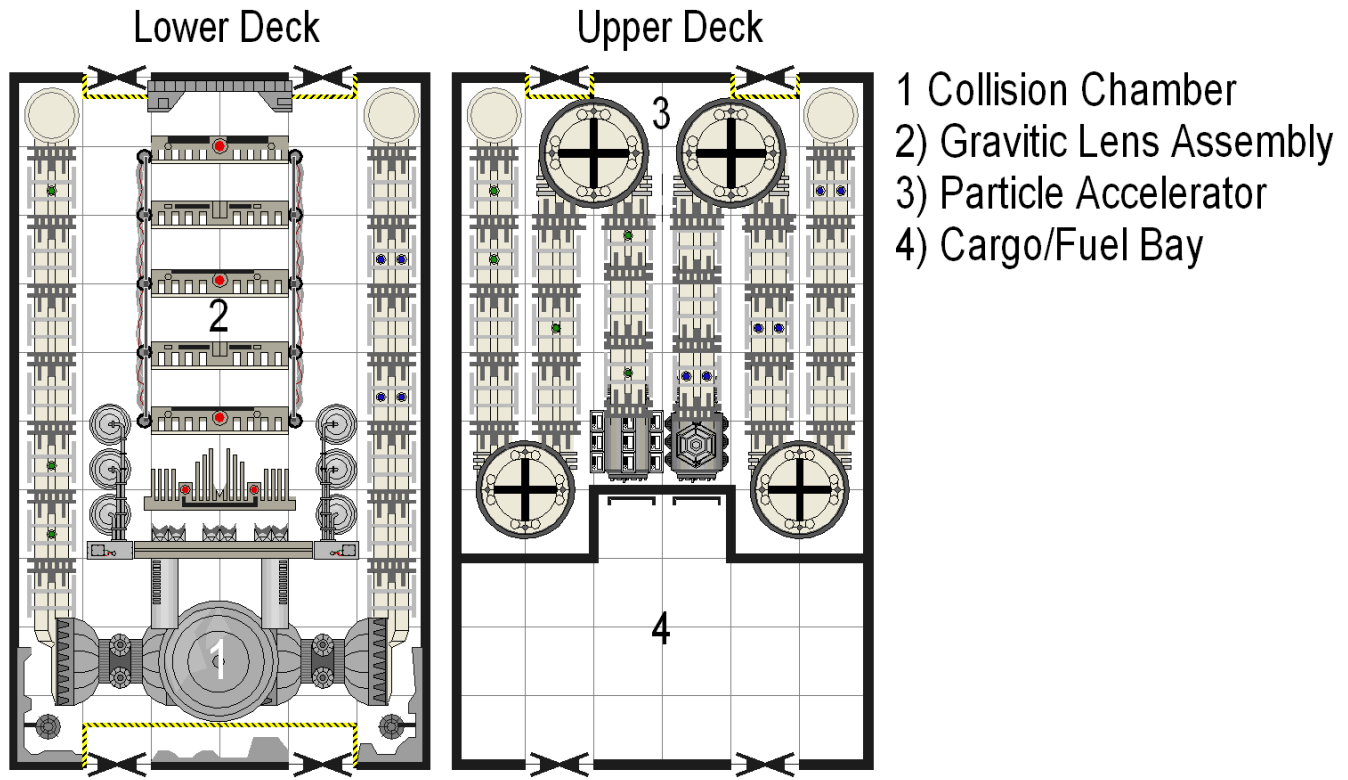
Role on Apparition Class

Every exceptionally wealthy, famous, or powerful individual has some need for privacy. Whether it's the unpopular dictator of a world seeking safe transit, a sector wide celebrity looking to slip the paparazzi, or ambassadors requiring quiet passage for secret negotiations. When brought on board an apparition, this module provides luxury coupled with invisibility. No one knows where a VIP is going, or when they get there. Finally, because of the large entertainment room, this module is also good for holding high level conferences or negotiations which would be extremely hard to "crash" or disrupt.

60-Ton Modules

Unlike the ubiquitous 30-ton modules, 60-ton modules are much more rare. While they do exist, they rarely conform to just one standard. The following 60-ton modules were purpose built for the Apparition class. To the design's benefit, however, each can be constructed from two empty 30-ton modules, fused together.

Meson Gun Module



The Meson Gun Module (MGM) takes the energy generated by the oversized fusion plant and puts it to potent, destructive use. When fired the MGM has little to no energy signature at its source. The egregious damage it inflicts will likely cripple one or more ship's system per shot. All of these make the MGM the quickest and quietest way to neutralize a target vessel.

The MGM may be fired across nearly 50,000 km of space. Even if a target vessel manages to locate the Apparition, this vast distance makes it very hard for them to retaliate or get away. To help assure this, the MGM is produced at TL-13 and is engineered to maximize damage.

The module consists of a particle accelerator (3) on the upper deck, a collision chamber (1), which actually generates the mesons, and a series of gravitic lenses (2) that provide target focus and tweak decay times.

The MGM also includes 10 tons of customizable space (4). By default, this is used for cargo or fuel. However, other uses include adding a stateroom for the gunnery crew and a particle beam barbette, a heavy missile barbette and 4 Bomb pumped torpedoes, or two particle barbettes, as summarized below.

Note that the utilizing the meson gun does not require that the module be exposed to space. Only upgrade this module with stealth technology if a barbette, turret, vehicle bay or other component is added requiring exterior access.

Messon Gun Module

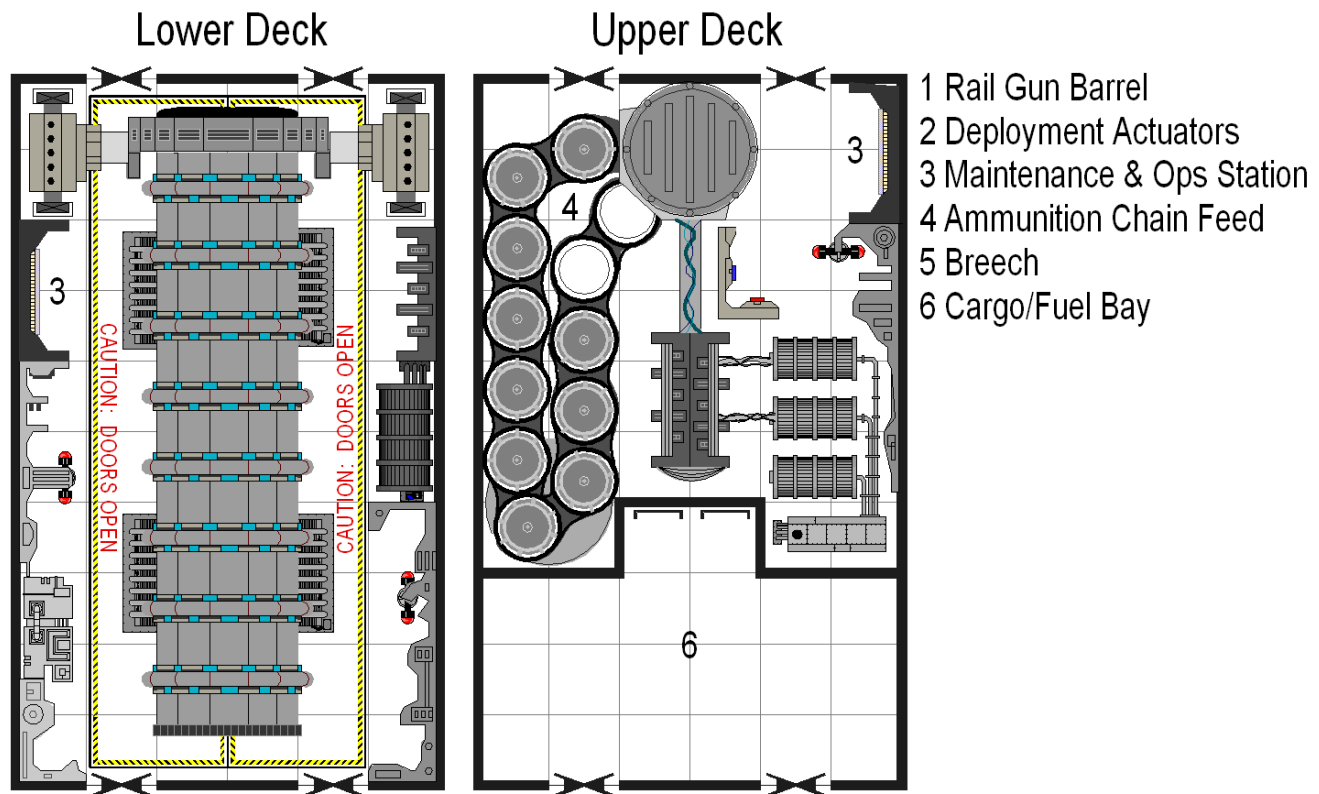
Component	Notes	TL	Rating	Tons	Price (Mcr)
60 ton Module Hull		10			1.60
50 ton Meson Bay	very high yield	13		50	62.50
Cargo/Fuel Space				10	
TOTAL				60	64.10

Messon Gun Module Options

Component	Notes	TL	Rating	Tons	Price (Mcr)
Module Stealth Coating	-4 DM to detection and lock sensor rolls, Traveller Core Rulebook p. 106	11	-4 to detect and lock on		6
Enhanced Stealth	-6 DM to detection, includes Model 1 computer, and basic stealth coating, displaces 2 weeks of module fuel.	12	-6 to detect and lock on		9.03
Improved Stealth	-8 DM to detection, includes Model 2 computer, and basic stealth coating	14	-8 to detect and lock on		12.16
Stateroom + Particle Beam Barbette	Spacious crew quarters for 2, and a particle barbette. Replaces cargo/fuel space.	10		10	5.60
Dual Particle Beam Barbettes	Two powerful particle beam barbettes. Replaces cargo/fuel space.	8		10	10.00
Torpedo Barbette	1 Torpedo Barbette space for 4 torpedos	9		10	3.00
Stealth Bomb Pumped Torpedo	-4 on sensor rolls to detect, 5d6 damage, negates modifier to detect Apparition upon firing	9		2.5	0.27

Stealth Bomb Pumped Torpedoes have a stealth coating, and use misdirection in order to keep their origins difficult to determine. They spend one turn on misdirection and, therefore, take an extra turn before they make their attack run. They will go active one turn before hitting their target, reducing the modifier to sense them to a -2. The extra functionality also reduces their payload somewhat, only doing 5d6 damage.

Ortillary Module



It was nearly 02:00 when I received word that the base alarms had been triggered. My men were good, but it was 03:21 when we had finally cornered the intruders in an admin building. They were tenacious bastards. I couldn't get any of my men closer than 10 meters to the building before heavy sniper fire took them down. I guess they'd given up on sneaking around. Even though my orders were to capture and interrogate them, I wasn't interested in losing any more of my people.

Captain Cruize owed me an old favor, and five minutes after a terse comm conversation, a 10-ton Grummer tank was on its way from the base armory. From the building, I'm sure they could see it coming for a long time. Good. Let the time sap them of their morale. Maybe they would be more interested in talking if they knew how serious I was.

We had it in the bag. We sat and waited as the tank approached. Then the sun rose. I checked my watch, it was only 04:02. Sunrise wasn't due for another two hours. Confused, I and my men looked up at the growing glow in the sky. We couldn't see much because of the clouds, but it kept getting brighter and brighter. Soon it was blinding. When it broke through the clouds I could see it for only a second, like a streak of blinding white flame. I didn't even have time to wonder if it was a meteor before it blew right through the base water tower and into the tank. We all stared bewildered for a split second. And then the shock wave hit us.

I remember a medic above me, shining a light in my eyes. His mouth was moving, but

I couldn't hear anything except a loud continual ringing. I realized I was lying down, and sat up to discover I was meters away from where I had been standing. Every building I could see had its windows shattered, and there was water everywhere. My men were scattered, some vehicles overturned, and the tank wasn't even a smoldering crater. I quickly looked at the admin building. There was no sign of them. I looked at my watch to figure out how long I had been out. It was cracked. It had stopped at 04:02.

The Ortilary Module is the ultimate in orbital fire support. It provides the ability to rain terrifying destruction upon the surface of a planet against which defense is difficult. Able to slip past sensor networks, and naval defenses, the Apparition provides an excellent platform for the weapon. Although potent, usage risks revealing the Apparition, so every shot counts.

The module consists of the rail cannon's barrel (1) located in the lower deck. When readied for use, two large bay doors open, exposing the lower deck, but not the upper deck, to space. The guns actuators (2) rotate the barrel down, and secure it to the breech (5), which extends downward from the upper deck directly above the barrel. The gun then extends to its full 30-meter length. The ammunition chain feed (4) then rotates, loading one shell into the breech. Loading and firing do not break the environmental seal on the upper deck, which may remain pressurized during gun operation.

When fired, the Apparition's gravitic thrusters must counter the force of the shells' acceleration. Still, crews can observe a momentary but noticeable "lurch." Fire control is normally performed from the bridge, but may be performed from the Maintenance and Ops station (3) if needed. The barrel is lined with extremely powerful superconducting electromagnets. While the magnetic field is largely localized to the gun barrel, crew members are advised to keep all metal objects and themselves behind the caution line during the firing sequence.

The module also comes with 10 tons of available space for cargo or fuel. Other options for the space include building out living space for the gunnery crew and an additional 12 shots of ammunition, or adding a torpedo barbette and 4 ortillary torpedos.

Ortilary Module

Component	Notes	TL	Rating	Tons	Price (Mcr)
60 ton Module Hull		10			1.60
50 ton Ortilary Module	very high yield	9		50	37.50
Cargo/Fuel Space				10	
TOTAL				60	39.10

Ortilary Module Options

Component	Notes	TL	Rating	Tons	Price (Mcr)
Module Stealth Coating	-4 DM to detection and lock sensor rolls, Traveller Core Rule-book p. 106	11	-4 to detect and lock on		6
Enhanced Stealth	-6 DM to detection, includes Model 1 computer, and basic stealth coating, displaces 2 weeks of module fuel.	12	-6 to detect and lock on		9.03
Improved Stealth	-8 DM to detection, includes Model 2 computer, and basic stealth coating	14	-8 to detect and lock on		12.16
Stateroom + Extra Ortilary Ammo	Spacious crew quarters for 2, and an expansion of the ammunition chain feed for an additional 12 rounds.	10		10	0.52
Torpedo Barbette	1 Torpedo Barbette and space for 4 torpedos (not included)	9		10	3.00
4 Ortilary Torpedos	8d6	8		5	0.05

Rules and Game Master Assistance

In over 32 years' worth of gaming experience there are a few things I've found that hold true. First, remember, the object is to have fun! It sounds trite, but it can sometimes provide valuable perspective. It doesn't matter if the rules were followed, if you properly adhered to "real world" physics, or if all the right rolls were made as long as everyone has fun. Second, think of ways to say "yes" to the players. Don't allow every cockamamy scheme or half-baked idea to work, but reward good ideas (particularly ones they're invested in), and be open to letting adventures succeed in ways the rules, the module, or you didn't anticipate.

So, while the sections contain rule clarifications, ideas, and new rules, think of it as just a framework to help you achieve the gaming experience you're looking for. If something here doesn't work for your traveller universe, as in all things Traveller, just ignore it, modify it, or use it as a guide, and then do what makes your gaming fun.

Detecting a stealthy ship

Opportunities to detect a stealthy ship include starting a search for the stealthy ship, and every time a stealthy ship does something to compromise its LPD (such as opening bay doors, using active sensors, turning on the transponder, entering combat, changing environments, etc).

Actively searching for a stealth ship

If a sensor operator is actively looking for a stealthy ship, make a single roll and let that result stand until a significant amount of time has gone by, or the sensor operator does something to change the probability of detection. This could be bringing additional, or more powerful, sensors on line by the sensor operator, or getting access to and attempting to correlate the results of multiple sensor operators from multiple craft. Allow task chaining and reward the good ideas of creative players working hard to find their target appropriately!

When a stealthy ship uses active sensors, it provides an opportunity for other ships to detect it at +2 (Traveller Main Rulebook, p. 43). For added fun, a GM could rule that if they miss the roll by two or less, they become aware that there are active sensors in use but not where they are coming from. If they make the roll, then they have, of course, found the stealthy ship. Locking on still requires another sensor roll subject to the stealth modifiers.

Transponders are designed to locate and identify ships. By default, a transponder provides a ship's location. Assuming this information is accurate, a ship which is actively transponding is as good as found. Even if this information isn't accurate, it conforms to a well-known signature and is fairly powerful. If for some reason a ship trying to be stealthy begins transponding, sensor rolls to detect that ship are at +4.

Stealth during combat



Stealth Ship Current Action	Benefit to locating	Example
Laser weapons fired	+2 to sensor roll	Pulse lasers, lasers
High energy weapons fired	+3 to sensor roll	Particle, or fusion guns
Slow mass weapons launched/fired	+4 to sensor roll	Missile turret, torpedo, rail gun
Meson weapon*	+1 to sensor roll	Meson or meson flicker weapon
For each 30 tons' worth of bay exposed	Reduce stealth modifier by 25%	Opening a bay door, extending a bay beyond the hull
Using active sensors	+2 to sensor roll	Lidar/Radar go active
Attempting to acquire sensor locks	+2 to sensor roll	"Painting" a target
Attempting to jam	+4 to sensor roll	Overwhelming a target's comms/sensors

Stealthy ships bring up interesting questions during combat. During a normal ship combat all parties become aware of one another either via sensors (including visual observation) before combat, or via sensors once they've been fired upon. That is, either sensor scans reveal the combatant ships to each other, or one party is aware, and makes the second aware once they are fired upon. Under normal circumstances, a ship that was previously unaware of its enemy can use the trajectory of the incoming attacks to locate the enemy and then return fire. The question of sensors often only comes up when

attempting to “lock on” as an additional bonus to targeting a ship. A stealthy ship is not a normal ship, however, and it must always be found, even to *begin* firing on it.

To initially find a stealthy ship that has fired upon a target make a sensor roll with the following modifiers. Note that the ability to lock onto a stealthy ship is unaffected by this. (You may know roughly where they are, but the signal return from the ship still remains low.)

In general the more energy a stealthy ship puts out, the easier it is to track. Direct use of physical objects, such as rail gun rounds, missiles, and torpedoes, allows sensors to observe their flight path and determine their point of origin much more easily than beams of light or charged particle streams. Attempting to acquire a sensor lock requires being active, as does attempting to jam a target.

The benefits are cumulative. Add any that apply, and roll each round of the combat until the stealthy ship is located or no one is looking (possibly because they no longer exist or don't have the means to do so). Remember, stealthy ships are actually hard to see, not just thermally, with RADAR, LIDAR, and densitometry, but also visually. Unless the ship has been located, gunners literally can't see a target and have no chance of hitting the stealthy ship over any real distance. Once the ship has been found, this location may be disseminated (and updated) to other friendly ships (routine comms check), during the ship action phase. Please note that a separate action/roll is required to obtain a lock on the ship.

*Also, note that because meson beams don't interact with the physical world, it's extremely difficult to “trace” them back to their source. The modifier here is given because the generation of meson beams isn't entirely a clean process. The byproduct of firing a meson gun is waste energy (RF) and stray particles that can be detected. If you don't want your traveller game to be a place where quiet ships (subs) can rain terrible damage down upon an unaware adversary only to slip away unseen, you may wish to increase that modifier to taste.

Environmental Effects on Stealth

Captain Reynolds looked over his sensor board with concern. The system defense boat was a new addition to the gas giant that he hadn't counted on. The fact that it appeared to have an extended antenna array worried him even more. He doubted the local yokels could have afforded to buy such a ship, so it must be on loan. Given the local system's relative unimportance in things it was likely to be just enough effort for some capital bureaucrat to "check the box." There would be only one. Even so, he could be spotted, and that just wasn't in the mission plan.

The boat hadn't seen him yet, but he was going to have to get a lot closer if he wanted to skim fuel. He lifted his eyes from the tactical information on the board to gaze at the Jovian giant. Its clouds were swirling shades of blue below the expanse of ice rings it seemed to wear like a sash. He stopped looking over the sensor board, and started looking over the shoulder of his astrogrator. A quick check told him what he wanted to know.

"Alright. Simms, find me a larger chunk of ice...yeah...that one will do. That's our new best friend. Roberts, plot us a tangent for that chunk. Let's get there at 3Gs. I don't want to give that boat extra time to spot us, but neither do I want to run out of fuel. Once there, Kensy, your job is to match vectors, but keep us close to our friend. Looks like that boat is burning the candle bright, and I want to be well inside our friend's sensor shade. Given the ring's period of rotation, we'll have a two-day stroll with it, until the planet is between us and the SDB. Once we're out of sight we get our fuel. Everybody on the same page?"

Space is vast, and it may seem that there isn't normally a lot of terrain that would affect the stealth of a ship. Below, however, are a few suggestions that not only add color to adjudicating stealth, but also interesting play opportunities. Given the nature of good players, GMs will encounter many more ideas than are presented here. In these cases, quick adjudication can occur by simplifying the game mechanic to an Int + Pilot, or Int+Astrogation, roll. The effect of that roll modifies the stealthiness of the ship. The GM can set the difficulty of the roll based on the rationalization put forth by the players as to how they are going to act and the general sense of plausibility.

Situation	Sensor DM Locate & Lock On	Notes and Examples
In general, using terrain (stellar or terrestrial) to “hide”	-Effect of Int + Pilot check or -Effect of Int + Astrogation check	Weaving among asteroids, hiding behind ice within a ring
Hiding within an electrical storm or atmospheric disturbance Storms can be of various strengths.	-1 to -6 depending on storm strength, requires pilot check at -1 to -6	Failed check causes 2d6 damage on the internal table, and unshielded computers automatically take a hit.
Diving deep in a gas giant	-4	Pilot checks at -2 are required. A failure check incurs 2D6 damage on external table. Skimming normally in a gas giant offers -2 to detect.
Further than 1,250 km from sensor during a minor solar flare	Minor solar flare: -2 Major solar flare: -4	Exposes the crew to radiation (Traveller Main Rulebook p. 142)
Closer than 1,250 km from a sensor during a solar flare	Minor solar flare: +2 Major solar flare: +4	Exposes the crew to radiation (Traveller Main Rulebook p. 142)
Hiding in normal cloud cover	-1	
Hiding in exotic cloud cover	-1 to -4	Exotic cloud cover may be dangerous: either corrosive (1d6 damage/hour), explosive (add a 1d6 to damage inflicted during combat), or radioactive.
Hiding in extremely thick Atmosphere or underwater	-6	Movement in this medium may be very restricted, and fast movement will disturb the medium leaving a trace and negating the stealth bonus.

Asteroids

Asteroids are a classic staple in sci-fi. They’re out there moving about, cold brown rocks of different sizes and shapes, some pockmarked from collisions. The obvious ploy is for a stealthy ship to move through asteroids for cover (Int+Pilot, difficult). However, there are other possibilities.

Many asteroids have high metal content. Perhaps the comms or sensor operator could find a series of sweet spots where the asteroids are (or will) create sensor shadows that the ship can hide in (Int+Sensors, very difficult). Plotting a course through that path (Int+astrogation, difficult modified by the sensor roll) while still going where you need to go isn't simple. Piloting that course, and making the real time changes necessary to dodge debris and stay hidden may be even worse (pilot+dex, difficult modified by the astrogation roll). This is a way to start to get everyone involved with the ship’s stealth.

If discovered, however, these same qualities can come to the aid of a ship. A savvy comms or sensor operator might find a way to scatter and bounce false signals through the rocks, confusing and giving false leads to pursuing ships. (Int+Comms or Sensors, very difficult). Over long periods of time, a ship's crew could set up sensor relay stations at various locations throughout the belt.

Gas Giants



Traveller crews actually tend to spend a lot of time at or in gas giants, for what is traditionally a surprisingly small amount of description. Gas giants are more than just large balls of gas where you refuel, however. They are interesting places filled with varied terrain.

Like our atmosphere, they tend to have many layers. Each layer can be different, containing different types of impurities, different amounts of visibility, and potentially different effects on sensors and comms.

Activity at the boundary between layers may provide ionization akin to the aurora borealis. While visually stunning, this also has an effect on sensor and comm signals. Some layers behave like giant wave guides, allowing sensors and comm signals to travel far beyond their normal range, but only within that layer of the planet. Inversions and other atmospheric disturbances may cause one layer to penetrate others, creating temporary “channels” to another layer, or even out to space. Regardless, taking advantage of this changing sensor environment is difficult. Unless a sensor operator is used to working in the environment, all sensor rolls within a gas giant should be one level more difficult. Sensor operators prepared for such an environment may find sensor rolls 1 level easier at the GM's discretion.

Because deeper layers have greater pressure, and more disturbances, most ship traffic skims at the highest layer with reasonably clean hydrogen, rarely venturing more than 1,000 km into the atmosphere. A ship wishing to remain unknown may purposely skim much deeper to avoid any chance

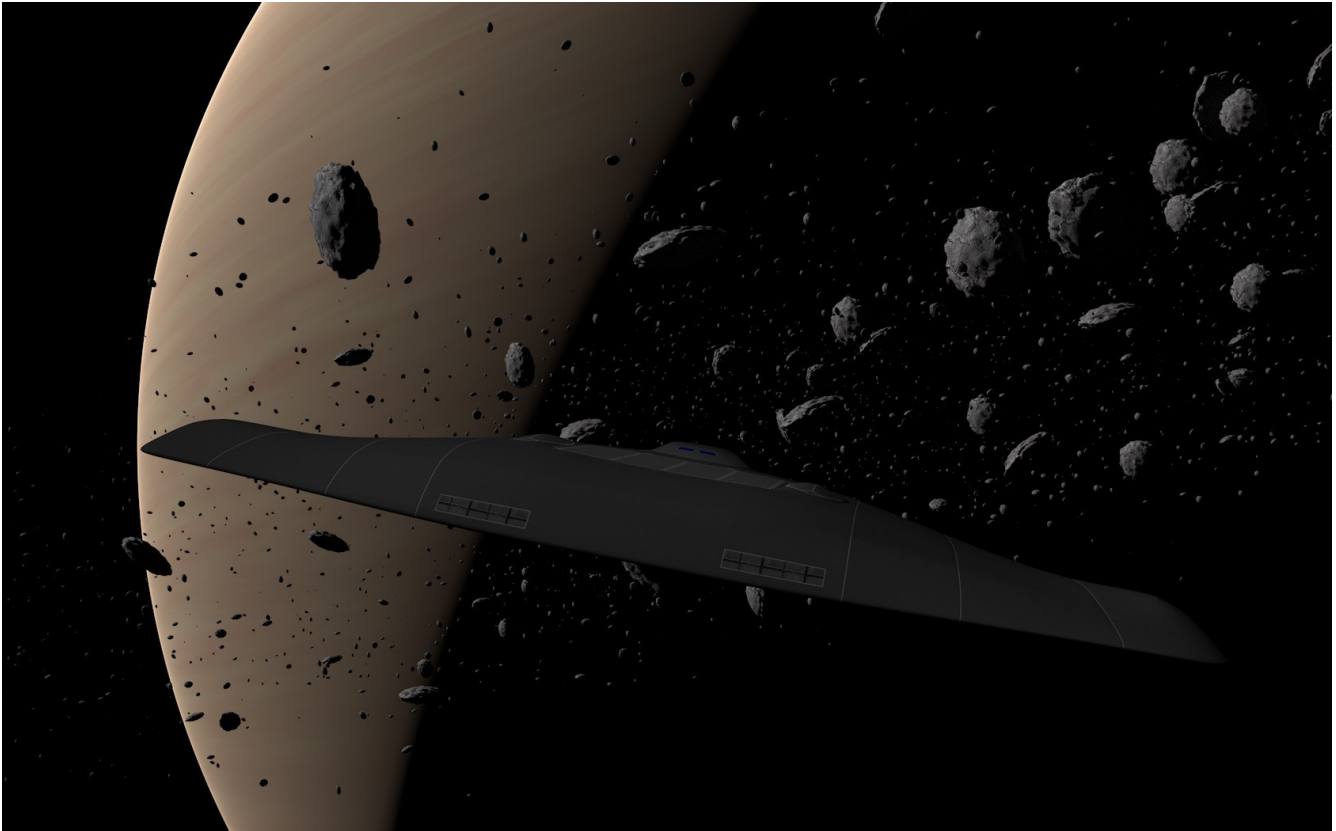
of contact with other ships. This puts more layers between it and any curious sensors, also increasing the difficulty of the sensor operator's task. A stealthy ship diving deep receives a +4 to stealth, but also incurs a -2 to pilot. Failing the pilot roll indicates that the ship dropped too deep, or hit an unexpected pocket of higher pressure. Higher pressure that is too much for the ship causes 2D6's worth of damage.

Within a layer, there tends to be laminar wind flow, but between layers, there can be a great deal of turbulence. This turbulence can be a playground for stealthy ships. First, such turbulence can kick up particles from lower layers, which in turn can generate electrical storms. Electrical storms throw out enormous amounts of EM, making most sensors almost useless. Of course, the more electrically active the storm, the better the protection from sensors, but the more physically violent it's likely to be. Flying through these storms is no picnic.

Set the magnitude of the difficulty the storm provides to prying sensors. Use the same magnitude of difficulty for the ship that has to fly within the storm per hour safely. A failed piloting roll indicates that the pilot wasn't able to keep the ship safe.

Starships are sometimes considered Faraday cages, but extremely powerful lightning strikes do unpredictable things. Electrical bursts can cause heat and EMP damage to sensitive equipment and systems. Beyond that, the physical loss of control within the storm exposes the starship to sudden and violently large physical stresses. After a failed piloting roll, throw 2D, and use the result as the amount of damage inflicted on the internal damage table. Unshielded computers automatically take a hit.

Despite the risk, such storms tend to be enormous in size (remember how truly huge gas giants are; these storms could be bigger than continents and moons), and become great hiding places for ships being pursued.



Planetary Rings

In real life, planetary rings may be made up of ice, or be the remnants of natural satellites and other solar debris captured by a planet. Chunks tend to be small (a few meters) and very far apart. This makes them very hard for a ship to “hide” in. The rings themselves settle into the equatorial plane where the gravitational stresses are minimized and have a natural rotation around their planet. Of course, in real life our knowledge reflects only what we can observe. While we do have ways of looking at planets in other solar systems, a great deal of our detailed knowledge comes from what we can easily observe right in our own solar system. Compared to the numerous worlds someone can visit with a jump drive, this is a rather small data set. Who knows what the rest of the galaxy is like?

In Traveller, planetary rings can have much larger blocks of mass that are much closer together. They could be anything a GM wants. They may contain the detritus of war (bits and pieces of old ships), chemicals or materials from industrial accidents, or hundreds of years’ worth of refuse generated by the unimaginably large industrial output a high tech planet of trillions can provide. A good rule of thumb, though, is that planets with people living on them will clean up their orbital space. Dead worlds, poor worlds, worlds no one cares about, or worlds without the appropriate tech level may not be able to clean their space.

The rings themselves could be at odd angles to the planet (maybe the planet has a strange center of mass, or it wobbles). Perhaps the local gravity system is unusual or complex, or maybe the rings are “new”, and haven’t settled in yet. Could the rings actually rotate in 2 axes around the planet rather than just one?

In many game respects this can be similar to the asteroids environment. However, remember that the rings conveniently orbit a planet and provide a natural conveyer to move the ship around the world, without being caught. A ship could even “land on” or attach to a large piece of orbital debris, and not expend any energy getting where it needs to go. Another interesting idea is for a ship to melt away a large piece of ice with its lasers at a lower power setting (dex+gunner turret, very difficult) leaving a hiding hole that the ship can enter (dex+pilot, very difficult modified by gunnery effect). The ship’s stealth systems would fool anyone scanning the ice into thinking it was solid ice, and away you go.

Solar Flares

Like storms, solar flares produce a great deal of electromagnetic radiation and create an environment difficult for sensors and comms. Positioning itself between a sensor and the source of solar radiation, a stealthy ship effectively “puts the sun in their eyes”. While masking is normally a problem, there is so much energy during a solar flare, and the ship attenuates it so little, that at distances greater than 1,250 km, this becomes an effective tool. Like riding out the storm, there are difficulties, namely exposing your crew to additional radiation as per the rules (Traveller Main Book, p. 142, Radiation Exposure). Also, this is a double-edged sword; at distances less than 1,250 km, because of eclipsing, a ship actually becomes easier to detect.

While solar flares don't occur at the convenience of a stealthy ship, some systems may have more solar flares, and/or more predictable solar flares than others. This may be particularly true of binary and trinary star systems due to the tidal interaction between the stars.

Atmospheric and Terrestrial Operations



Many worlds with atmospheres have clouds. All gas giants have clouds. In the real world, clouds can be made of different chemicals. On an earth-like planet, clouds are mostly water. In a gas giant, they may be hydrogen, helium, and sometimes even ammonia or methane. On planets with exotic atmospheres, you may have chlorine clouds, or large amounts of methane clouds. In the game, any kind of cloud the GM and players can conceive of is possible.

The key point is to determine how these clouds affect the starship stealth. Here we assume that many ship-borne sensor packages are configured for space surveillance. Sensor sweeps through an atmosphere and in particular water cloud cover do degrade (over some EM bands). A ship hiding in cloud cover should get a +1 on their stealth.

Exotic clouds may have any effect on stealth the GM assigns to them (+1 to +6), but may also have detrimental effects on the ships using them. Some exotic atmospheres may be corrosive (sulfur-dioxide, hydrogen-chloride), explosive (methane), or even radioactive (radon, or clouds containing radioactive isotopes from surface volcanic activity). GMs should feel free to impose the penalty they think is appropriate for the story at that moment. As a suggestion, corrosive clouds could cause 1d6 damage/hour; explosive gases may only be a problem during combat or storms, causing an additional 1d6 damage per hit. Radioactive clouds may provide an extra crew hit on radiation attacks, or expose the crew to 1d6*50 rads on a hull breach.

Even if nothing went wrong during a ship's stay in an exotic cloud, there may be some lingering effects. Acidic clouds may damage the stealth systems on the surface of the hull by pitting and eroding the coatings and electronics. This may degrade their effectiveness by 1 for every 6 hours spent in the

cloud. Radioactive particles may remain in small amounts on the ship's hull requiring it to be scrubbed at a star port during maintenance. All exotic atmospheres may put a strain on the environmental systems of the ship requiring early maintenance to clean filters, fuel scoop ports, and the like.

Stealthy ships may choose to seek refuge under water or in thick atmospheres. Assuming the pressures aren't high enough to cause damage, these may be an ideal place to hide from high tech densitometers, NAS, radar, LIDAR and the like. Ironically, hiding in a hydrosphere exposes the ship to other, sometimes lower methods of detection.

Rapid movement through a thick medium causes physical turbulence, which can sometimes be observed and quantified. While densitometers may not pick up the ship itself, a stealthy ship moving at anything more than a crawl will have its wake detected (edu+sensor, difficult).

Normally the stealth systems of a star ship are not geared for such environments and actually offer **no** protection against these methods of detection. However, a high tech polity rarely trains its space navy in such methods, and they may be practically unaware even of their existence. A sea navy is another matter, however.

Stealthy Jumps Without a Stealth Jump Drive

Long before stealth jump drives were available, there were still smugglers and spies. The following are some examples of how a ship can jump quietly (into and out of a system) without a stealth jump drive.

Situation	Sensor DM to Detect Jump	Notes and Examples
Jumping where you can't be seen	Task chain opposed by 2d6 modified by system security chart	Jumping behind the system's primary star, on the opposite side of a planet, or behind the planet's moon. Requires knowledge of where sensors and patrols are likely to be and some luck.
Jumping into an Asteroid Field	-4	Appearing in the middle of an asteroid or possibly ring system. Requires (edu+Astrogation, average) roll.
Jumping far away	-6	Appearing 6AUs above/below the ecliptic plane.
Hide in plain sight	Sensor roll is opposed by stealth task chain effect	Posing as a different ship, changing transponder signals, and emitting EM To look like a different ship.

Jump where you won't be seen

Since a ship that jumps into a system within minimal range of a sensor is automatically detected, it's important to jump where a ship can't be seen. It's hard to see everywhere all the time. Significant objects between the sensors and the jump point prevent observation of the jump space transition. These objects include natural satellites, like a moon, or celestial objects, like other planets

and stars in the system. There's no chance a sensor platform can pick up a jump transition from a ship on the opposite side of the primary star, or even the opposite side of the planet itself. Knowing where the patrols or sensors are is the hard part.

Characterizing how much the incoming ship knows about the system it's jumping into can be done through a task chain: determining where normal traffic is (edu+astrogation, easy) plus figuring out where the patrols are likely to be (edu+tactics: space, average), figuring out where the sensors are likely to be placed (edu+sensor, average), then plotting the final jump as normal, modified by the chained effect. To oppose this roll, we have to characterize the likelihood that the target system has placed sensors and planned the appropriate patrol to secure itself. Roll 2d6 and add the appropriate modifiers on the following table. If the resulting effect is higher than the previous task chain effect, the inbound ship is somehow discovered – perhaps by a patrol, automated sensor platform, or even a lone Belter off the beaten trail. If it's lower, then the jump transition goes unnoticed.

System Characteristic	Modifier	Rationale & Notes
For each base (pirate, military or otherwise)	+2	Security is natural for a military base. Depots count as two bases.
Main world is rich (Ri)	+1	Additional traffic from commerce – they have the means to purchase sensor systems and higher patrols.
Main world has high technology (Ht)	+1	It's easier for the main world to field space-borne sensor platforms and patrol ships.
Main world is poor (Po)	-1	The system can't afford to patrol or deploy sensors.
Main world has a class A starport	+2	Assumes additional traffic in system, attracted by port facilities.
Main world has a class B starport	+1	Assumes additional traffic in system attracted by port facilities.
Main world has low technology (Lt)	-1	The main world doesn't have readily available platforms or ships to secure its system.
No gas giants in system	-1	Traffic tends to stay near the main world.
The system is expecting an intrusion for some Reason	+1	Examples include, gold rush in the Asteroid belt, recent pirate attacks, etc.

This can help both jumping into and out of a system, but usually involves somewhat longer transit times getting to the destination. This method is the most common way to quietly enter or exit a system.

Jump into an asteroid field

A special application of the principle, “jump where you won’t be seen,” is jumping into an asteroid field. While some asteroids are very large, and the field itself has a tremendous mass, it’s spread so thin that there is no gravity well to speak of. An asteroid field doesn’t significantly hamper a jump transition. Jumping into an asteroid field, however, is still a risky proposition, with lots of potential complications. When you’re looking to be quiet, though, the assistance of all those floating bodies to mask the jump *usually* makes it worth it.

Both jumping into an asteroid field and jumping behind a celestial body are much more difficult in systems that have the reason and wherewithal to place remote sensor platforms, and send patrols, to remain vigilant over their space. In general, these are systems with a lot to lose, should piracy flare up, and intel be gathered, on their operations. Examples include, systems with military bases and those with large amounts of valuable commerce. Even so, not everyone is vigilant all the time. Still, there are other options.

Jump far away

Space is very, very large. Most solar systems exist in a single plane orbiting their primary, known as the ecliptic plane. It is possible to jump far outside this plane, giving an advantage because the jump occurs both far away, and at an obscure location where sensors are not normally observing. The sensor chart only goes up to about 50,000 km, jumping above a system at about 6 au's or 1,000,000,000 km is well beyond this range. While thermal or visual observation of the transition is still possible, over that much distance it would be less than an obscure pinprick of light amongst all the stars, and only for a moment. Even more importantly, a stealthy ship, like the Apparition, is dark immediately after the transition – so, was it a jump signature, or a sensor glitch? The downside is that even a ship with 6G has about 3 days’ worth of transit to get anywhere of value.

Hide in plain sight

Another way to hide the jump into a system, is to not hide it at all. Determine what a different craft's sensor and comm signature would look like, say a 200-ton Animal Class Safari ship (edu+sensors, average)/(edu+comms, average). Configure the transponder to squawk as the alternate ship (edu+comms, routine or difficult if the transponder isn't meant for this). Configure the stealth systems to create the appropriate thermal and EM footprint (edu + comms, difficult) (int+sensors, routine). Then Jump to the local gas giant. Disappear into the gas giant for refueling, switch off the transponder, reengage the stealth systems, and slip away. Belief in the ruse becomes an opposed (int+sensor) roll. An opportunity for role playing could present itself, should inbound control, or the local patrol, contact the ship for some reason. This is also a ripe source for fun complications should the GM wish to spice things up for the players.

Stealth with Normal Ships

Just like jumping without a stealth jump drive, sometimes there's a need to travel in system quietly without the benefit of multi-million credit stealth technologies. Whether your adjudicating a band of pirates waiting to ambush the PCs, or the PCs trying to sneak past an interdiction cruiser, the following section is provided to help adjudicate these situations.

Please note that actual stealth coating deals with the same issues as addressed here, therefore the effects of running cold are not additive with “industrial strength” stealth treatment.

Situation	Sensor DM Locate & Lock On	Notes and Examples
Running Cold	-2	Power everything down and just drift through space.
Temporary Stealth Coating	-2 -3 on effect 6+	Won't take much punishment, difficult to obtain, still costly, and you still need to paint the ship.
Running Cold + Temporary Stealth Coating	-3 -4 on effect 6+	

These effects are not normally additive with permanent stealth coating, though they may assist (up to the permanent stealth coating's normal maximum effect) if the permanent stealth coating has been damaged or compromised.

Running Cold

The first rule of thumb is that energy output is the enemy. Sensors detect energy. For a ship to be stealthy, it must minimize its energy output. To dampen the energy output of a ship, the crew must understand what systems are generating what energy and how that might be detected (edu+engineering (any), average) and/or (edu+sensors, average) and/or (edu+comms, average).

Comm systems are obvious sources of energy emissions, as they are actually designed to transmit energy over long distances. Power systems by their nature create electro-magnetic “noise” as they convert energy to generate electricity. Fission and fusion plants are much more noisy than chemical power plants, running off batteries, and solar panels. Gravitic thrusters take the energy from the power plant and convert it to movement. While they are less noisy than the power plant, they are not silent. They also create minute (compared to planets and stars) gravity waves, often referred to as “gravitic wake,” as the ship moves through space. Just like on water, the faster a ship moves, the greater its gravitic wake. Reaction drives, like rockets, don't generate much electromagnetic energy, but tend to generate considerable heat and light, and leave behind the propellant. Finally, life support systems generate heat. This heat eventually makes its way to the hull and radiates outward, making the ship a thermal warm spot against the cold of space.

To combat these emissions, a ship can “run cold.” The ship is set in motion on an intercept course for its destination, (int/edu+astrogation, average) and then everything is powered off. That is, the transponder and comm transmitters, the power plant, maneuver drive, and life support all spun down to nothing. Most normal people will find this uncontrolled flight terrifying. Dark and alone in the void, the ship's hull creaking in strange ways as it cools, and only Newton in the driver seat. While this does minimize the energy signature of the ship, there are significant disadvantages.

First, life support exists for a reason. To survive without it, the crew must *live* out of vacc suits. (It isn't unreasonable to start chaining tasks with a dex+vacc suite, edu+vacc suite sequence, or make a single end+vacc suite role per hour and increase the difficulty of tasks performed one step if it's failed.). This gets pretty uncomfortable over time, and requires some investment in suit packs and the like.

Second, this takes a *long* time even for short trips. Travel time in the game assumes constant

acceleration and then deceleration. During this trip, the ship won't be accelerating. For the game's sake, a trip from a nearby gas giant might take months (1-6), while a trip from a moon to its planet will take days (1-6). To maximize the acceleration and deceleration and minimize transit times, gravitic slingshots can be used (edu+sensors, routine to see where all the celestial bodies are precisely chained with edu/int+astrogation, difficult to plot the course, chained with dex+pilot, difficult, to execute). Successfully doing this, allows the travel time to be cut in half. GM's should feel free to allow the characters to take more severe slingshots, at higher levels of difficulty. Failed rolls could indicate being pulled into the celestial body rather than around it, or flying way off the mark and missing the destination entirely. Gravitic braking will be required on the opposite end, unless the ship is going to power up and decelerate under its own power.

Temporary Stealth

A permanent stealth coating is expensive and durable, but who's to say that's the only kind of stealth coating available? For every successful product, there are countless other products and prototypes that failed before it. These lesser products may not have been a complete failure, simply not as desirable as the final product. Incomplete failures are partial successes.

Such partial successes may provide a low probability of detection, but degrade during a jump, or atmosphere operation. A coating could have a detrimental effect on the hull or armor, yet still do its job. A coating might work well against LIDAR or RADAR, but do nothing for thermal.

Before the coating can be applied, flaws and all, it must first be obtained. Since most authorities see no legitimate purpose for such a product, finding it will have to be done through illicit channels (int+streetwise, difficult). When dealing with the black market, there is always the possibility that the product is a complete scam. Such coatings are highly desirable. Other parties may cede the honor of paying for the coating to the player characters and then pick it up later, either through subterfuge or outright violence.

Player characters may also be able to make their own coating if they can think up an appropriate task chain. One suggestion is to allow edu+chemistry, difficult, chained with edu+physics, difficult, to determine what chemicals are needed to make the coating. Raise the difficulty to very difficult if one of the two skills isn't available. Int+streetwise, average, to obtain the correct amount of the right quality chemicals, dex+mechanical, routine, to apply it, and edu+sensors, routine, to check it for thin spots.

Such coatings should never last more than one jump, and by themselves, not be as effective as the "real thing", but they might just do the trick in a pinch. Coatings or the materials used to make them cost 1,000 credits/ton of ship to coat, but the expense can be reduced by 20% for every roll on the unexpected characteristics table up to a maximum of 3 rolls (60%). The time required to apply the coat is 4-14 days, given class C star port facilities or better.

Roll	Unexpected Characteristic
2	Coating reacts with something unusual in the atmosphere, or jump space. It eats away at the armor (or hull if no armor is present). Reduce the armor value by 1. This can be restored through the normal repair process at class B starport facilities or better.
3	After interacting with something in jump space, or the atmosphere, the coating reacts very badly with high-energy weapons. Increase the damage from lasers, particle, and fusion weapons by one die and degrade the coating's effectiveness by one. Do this for every such hit, until the effectiveness is 0.
4	Coating interferes with even passive sensors. Increase sensor tasks by one level of difficulty.
5	Coating leaves permanent marks on the hull, obvious evidence that it has been used. Removal requires 1-6 hours, 1 ton of spare parts, or 10,000 credits per armor point or hull point if no armor. Failure to do so increases the chance of notice by naval and custom authorities, and the intensity with which they will examine the ship.
6	The coating is thick and spreads poorly. It takes twice as long to apply, gumming up paint guns/brushes etc.
7	Under intense energy load, the coating's effect degrades. This means that once located, the coat provides no benefit against locking on.
8	The coating interacts poorly with the ship's active sensors. Degrade the stealth capability by one whenever active sensors are used. This is in addition to the +2 active sensors use provides in locating the ship.
9	The coating dries, turning an unfortunate color. Decrease its effectiveness by 1 within 5,000 km with respect to location. Its effectiveness against locking on remains unchanged.
10	During the paint process chemical dust, either from vac suits, clothing, airlock filters, engineering access panels, fuel scoops, or air recyclers, gets into various filters and subsystems. Monthly maintenance costs are doubled trying to get the insidious chemicals out, and the time until the next monthly maintenance is halved (potentially unbeknownst to the crew). If the ship would normally be due for maintenance in 1 week or less, it is now due for maintenance. If maintenance isn't performed, make a roll under the Repairs and Maintenance rules (Traveller Main Rulebook, p.138) at some point during the next week.
11	Coating is significantly affected by travel through jump space. Reduce its stealth bonus by one after jump.
12	Something unusual happened during the mixing, or application process for the stealth coating. Roll 1d6. 1-3 the coatings effectiveness is increased by 1. 4-6 a portion of the Coating remains permanently on the ship. The ship is now -1 to detect on sensor rolls.

Plot Hooks and Scenarios

The following are a few plot hooks for use with an Apparition class ship, and the stealth guidelines presented in this book. They follow the traditional Traveller plot hook format and only provide the key ideas, leaving much of the creativity up to the GM to flush out.

Successful Apparition-based plots work well when the GM uses the aspects the players enjoy most in the scenario. Some of these include traveling to locations where great powers don't want them to be, learning things no one is supposed to know, providing key moments for the players to reveal themselves and make the greatest difference, and projecting power no one is expecting. The Apparition provides the players an opportunity to operate at a level well beyond the reach of a normal 400-ton ship. At the same time, many of these accomplishments only mean something if they are earned. The greater the reward, the more difficult the journey. Finally, some of the best science fiction isn't driven by the technologies, but by the people, and the human condition.

Rusty Freight is Never Late!

Russ salvaged a large cargo plane after the world war ended on his balkanized lower tech planet a year ago. With it, he's started "Rusty Freight," and managed to make quite a name for himself. After a year of successful flying, the engines are no longer reliable, and pressure from his competitors is forcing Russ to sell the plane. He knows he'll get more for it if he gets the rust taken care of and tunes it up. His rivals know this too, and they've made sure none of the locals will help Russ. They plan to add his plane to their cargo fleet dirt-cheap.

Russ, however, managed to find the player characters and hire them on. As the players begin repairs to the plane, they'll soon discover that the rust on Russ's plane isn't actually oxidized iron. It's a partially compromised stealth coat. The silver isn't aluminum, it's an inactive TL 14 trideo emission matrix. The biggest problem with the engines is that they don't take petrol. They're fusion cores, and the filters are all clogged after a year of sifting out the petrochemicals to get at the water in the (cheap) fuel. Oh, and behind the wall of aluminum braces is a jump drive. His plane wasn't a lost cargo hauler it was a crashed Apparition prototype!

1. His competitors don't appreciate the players' interference. They will arrange for a series of increasingly dangerous "accidents" to scare the players off, and if that doesn't work, things may get ugly.
2. Strangers begin snooping around the Apparition. They intend to destroy the ship just after they get the encrypted data from the hidden data core.
3. Air raid siren! The old war enemy is back without warning with new RADAR sensors in their planes. Friendly forces are falling out of the sky almost as quickly as they can take off. Without a way to intercept them, the enemy bombers will be here in minutes certain to leave the city and its people in flaming ruin.
4. After the first failed attempt to bring the jump drive online, the players have attracted the attention of a 200-ton craft in the system's asteroid belt. It's not transponding, but has gone active and is heading the players' way.
5. An Imperial warship with its advanced sensors has arrived in orbit. Under the guise of "rest

and relaxation” its crews begin what looks a lot more like a search operation.

6. Russ is actually the craft’s original pilot. Pick one of the other scenarios above. If the players prove themselves to be a sharp, trustworthy crew, he'll offer them the adventure of a lifetime.

NOTE: This is a good introductory adventure. It provides the opportunity for the players to discover the capabilities of the ship, and the GM to reduce those capabilities to taste, due to “crash damage.” Over time the players can repair/upgrade the ship to achieve its full potential.

Broken Arrow

An extreme fundamentalist group has managed to obtain fissile weaponry through sabotage and subterfuge. They've stowed it aboard a 200-ton fat trader and plan to detonate it inside the busiest highport in the entire sector, not coincidentally located at the sector’s business capital. The primary blast will kill millions, and throw the markets into disarray. There's no possibility of shutting the highport down, or evacuating it. If any credible word of this got out, the panic alone might kill thousands.

The players have just 6 weeks, their Apparition, and whatever modules they need to figure out which fat trader is being used to carry the bomb, find it, and neutralize it without anyone being the wiser.

Complications can include:

1. The 200-ton fat trader is being escorted by a 1,000-ton bulk freighter which has been loaded with 12 heavily armed and dedicated fanatics, 5 double turrets, 6 make-shift fighters, and two transports.
2. The fundamentalists are using hostages to shield the munitions.
3. The fundamentalists put only half of the weaponry on the fat trader. In case they fail, they'll use the other half for plan B, which is much worse, unless the players stop them.
4. Along the way the players become aware of an independent reporter who is on the verge of obtaining credible evidence to break the story.
5. The players uncover a secret meeting between the mastermind of the fundamentalists and the group’s financial backers. Dealing with the meeting may cost them between 1-3 weeks, but could end this group's threat forever.
6. None of the scenario is real. It’s a test by to make sure the players are finally ready for the actual mission.

Codename Pied Piper

An absolute dictator holds power over several systems by kidnapping children of the elites. The elites have recently determined the system where their children are being held. The players, and their Apparition, are being hired to safely extract the children, and move them to a secret location after which the revolution can begin. It’s important that word of the rescue take as long as possible to get back so the dictator is caught completely unaware.

Complications:

1. The children are being held on another Apparition class ship! They are kept in a DTM as the Apparition secretly travels an interstellar circuit. Along the way it meets with various ships to obtain supplies, and release communications.
2. The children have been moved over the border. They live atop a single building within a floating high tech arcology. The system belongs to the unfriendly neighboring interstellar empire.
3. The children are in cold sleep on an orbital platform. While the system lies well off the x-boat routes, there is always a jump 4 courier docked at all times.
4. The location was wrong. The players must quietly follow the dictator's personal yacht as he tours his systems, intercepting and decoding his communications until the real location can be discerned. The dictator always has a heavy escort.
5. When the players arrive to obtain the children, they find the dictator is visiting. While there is more security, it's somewhat lax, as the dictator feels more secure here.
6. One of the children is an android, inserted as a security measure. Given the opportunity, the android will sabotage the players' mission. The children must remain safe, but not so the players.

The Rescue

A wealthy noble of political importance needs to save his mistress. He contacts the players and offers considerable money if they can use their Apparition to rescue her. Their greatest discretion is required, of course.

Complications:

1. She's being held in a rival noble's home system. Everyone there is fiercely loyal to the rival, and there are considerable assets protecting his estates.
2. She's an agent, on an important mission. She'll need the character's help.
3. She's not really his mistress, but someone of importance to his rival. The rescue is actually abduction.
4. When the characters arrive, she's enroute to the capital, where the noble's enemy plans to use her as evidence to expose the affair.
5. They arrive to find the whole system has broken out in civil war.
6. It's a trap. The mistress is really a scheme concocted by the two nobles to get an agent inside the players' ship.

Pandora's Box

Something in a nearby interdicted system has the scouts and the navy in a tizzy. No one really knows what it is, but they want to. Bad. The players have made a good reputation for being stealthy with their Apparition. **A lot** of money will be floated to them if they can infiltrate the interdiction, find out what's going on, and come back with real info and maybe even evidence to support it. It's very important that no one know that the players were there at all.

Possible scenarios include:

1. Research into an automated weapons platform has gone awry. Jumping into the system reveals the broken hulks of ruined ships and scattered debris near the main world. A small number of naval ships are either tracking or being tracked by something in the asteroid belt.
2. All eyes are focused on a team of terrorists that have taken a lab ship and its scout research team hostage. A second team is quietly stealing the team's research on the planet below.
3. Several extremely high-ranking officials from two interstellar empires are meeting in secret. They are to discuss the urgent, mutual threat from a never before encountered third party.
4. Naval forces are scouring the system to find a cunning thief that has taken some ancient tech the scouts were studying. The original altercation damaged the thief's jump drive, stranding the thief here, but forcing him into hiding.
5. Several large military ships from the neighboring unfriendly interstellar empire lie under a protective covering on the main planet. They are being readied for a secret mission the Navy has spent years preparing for.
6. The scouts have finally managed to open the ancient orbital gate at the system's gas giant. They are just about to launch an expedition into the pocket space within. A second as yet unnoticed gate in the asteroid belt also has opened. Something is about to journey out.

Flight of the Stellar Shadow

The fleets are massing for war. The player characters are chosen as crew for the not entirely complete Stellar Shadow. They are given papers of safe passage deep into unfriendly territory. They must pick up their high-ranking diplomat from the secret location where peace talks have been successful and bring her back without incident to the capital. Naval command knows that tensions are high, and feels sending a gunboat will only make things worse. However, they still need to keep the diplomat safe, and an Apparition is the best way to do that. If things turn ugly, the Stellar Shadow can simply disappear and quietly make its way back across the front.

The Stellar Shadow is given an orbital insertion module, and an orbital support module, using the rest of its cargo capacity as fuel storage. At the players' option, they may also have a drop tank mounted at 100 tons. This won't make much difference on the travel time there (it's 9 parsecs away), but it does provide a way to change the stealthy profile of the ship, and make it look more like a transport and less like a military vessel. While the tank is mounted, the ship is reduced to jump 3, maneuver 4, and takes 50 tons of fuel per parsec jumped.

Complications can include:

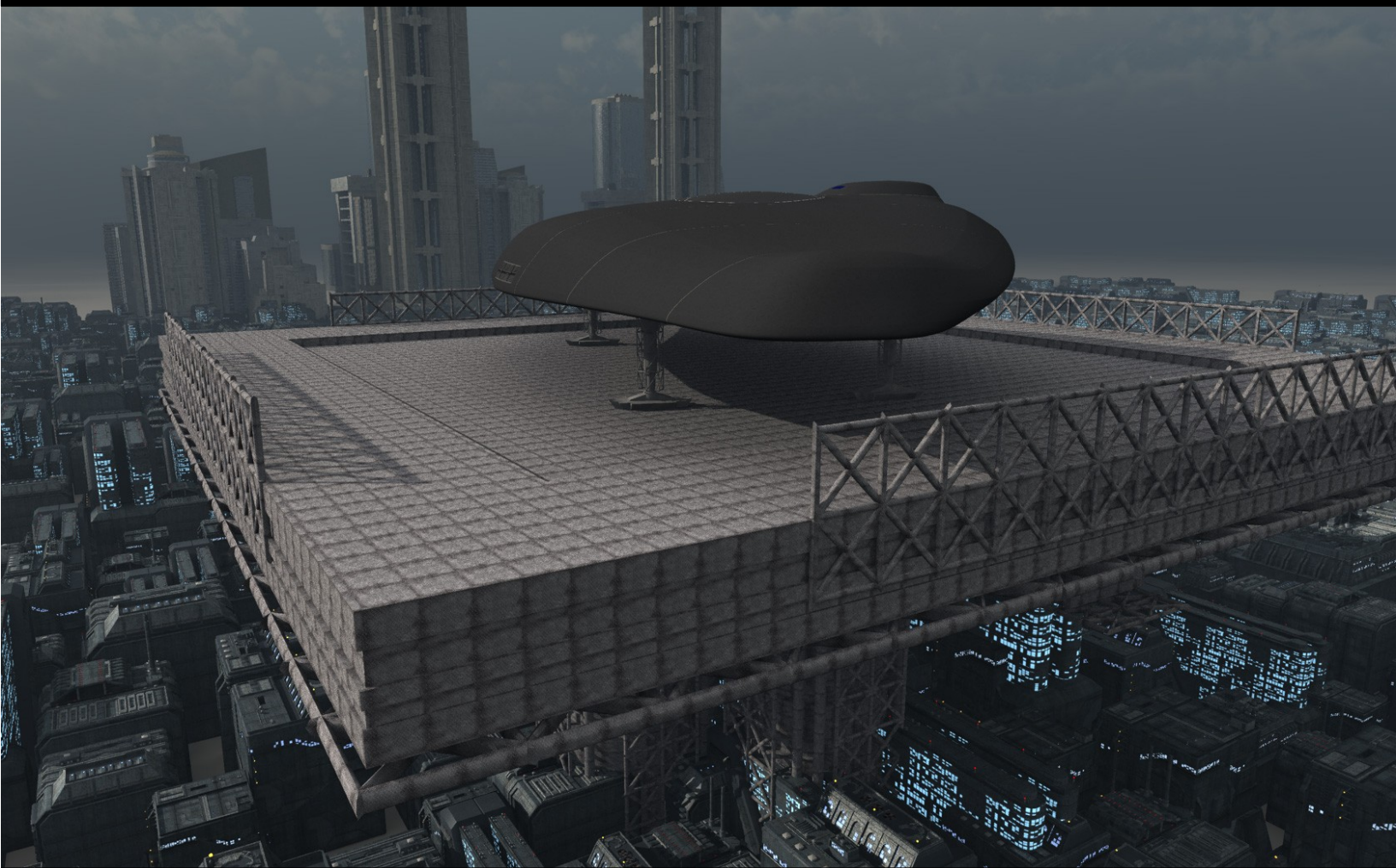
1. Once in unfriendly territory the validity of papers quickly breaks down (2nd jump) and they need to use subterfuge and stealth just to get to their destination. Once they have the diplomat, they will be given new papers to ensure a safe trip out.

2. As in 1, except the peace talks weren't actually successful. The diplomat must be broken out of a detention center at the military base, and they won't be provided with papers for the transit out (of course).
3. As in 2, except once the diplomat is rescued, she reveals proof that the war is being instigated by a conspiracy between a mega-corporation and commanders on each side. If she can get to the players' capital, she can bring justice, and end the war before it even gets started. Getting out will be especially hard as the military will be pulling out all the stops to prevent the diplomat's return.
4. As in 3, except she needs to get to the enemies' capital. The enemies' military will have blockaded key buildings in the capital, and when they get there the council is voting on the war within 72 hours!
5. As in 3, except the conspirators are alerted to the diplomat's knowledge. Once crossing the front, they will be ambushed at a depot (either in person via an intrusion team disguised as a fuel hauler, or by the ship in the high guard position at the gas giant). They'll have to fight their way out, while figuring out the safest way to get the diplomat to their own capital.
6. As in 5, except the millinery will even have blockaded key diplomatic buildings in the capital and they'll have to sneak in!

GM's should build the suspense of getting to their destination without getting caught! Count down the kilometers. Remember to provide interesting stellar and terrestrial terrain for them to move through. Punctuate the experience with close calls, and short periods of action! "They've made us. Quick, jam them! Don't let them get word to the cruiser. Spin up the drive, we've got to get out of here now!"

Throw in the unexpected... "What the..... why would a 200-ton merchant deploy an extended sensor array."

Feel free to culminate in a fevered battle or chase!



Requires the use of the Traveller^(TM) Main Rulebook, available from Mongoose Publishing.

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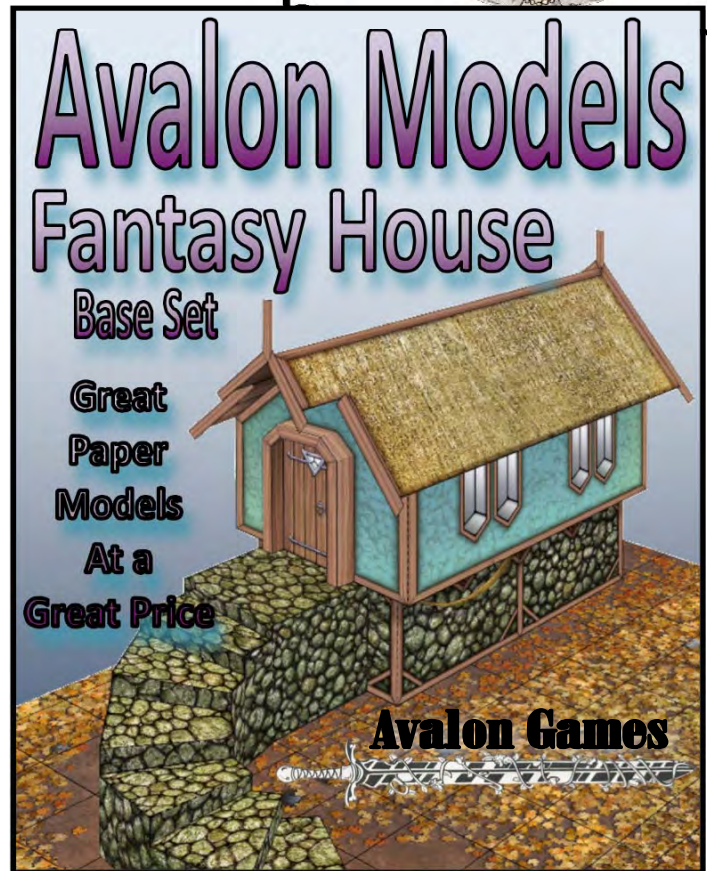
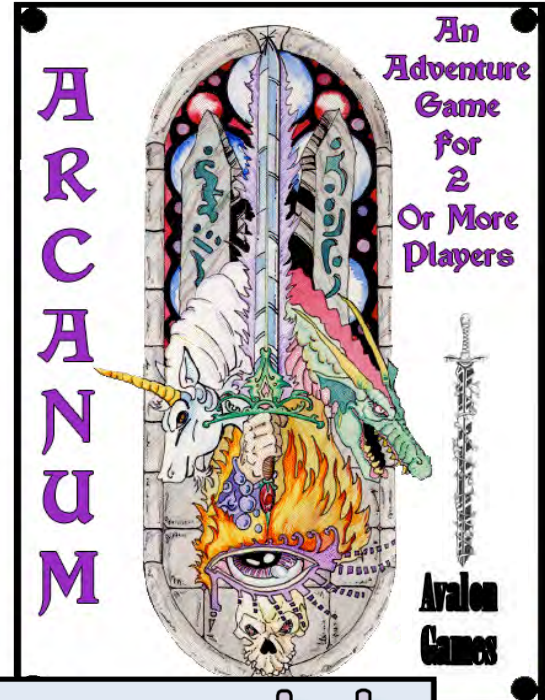
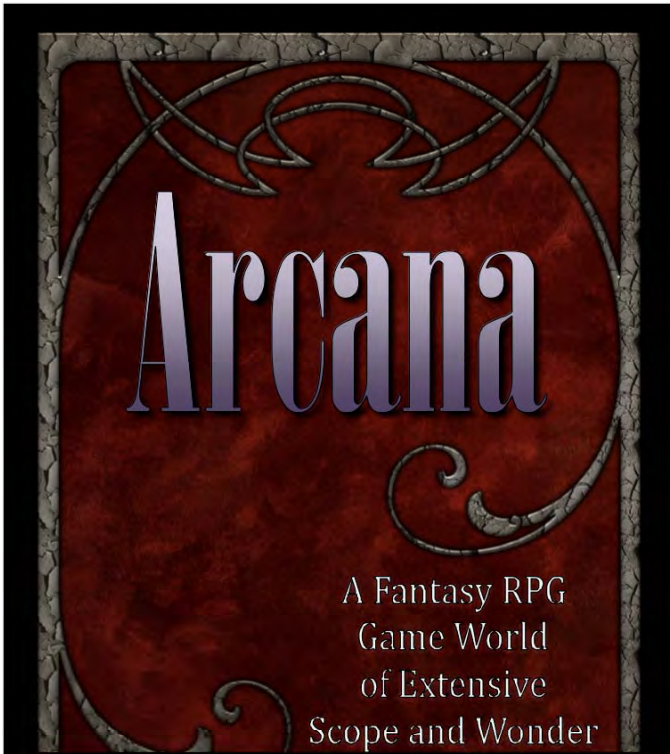
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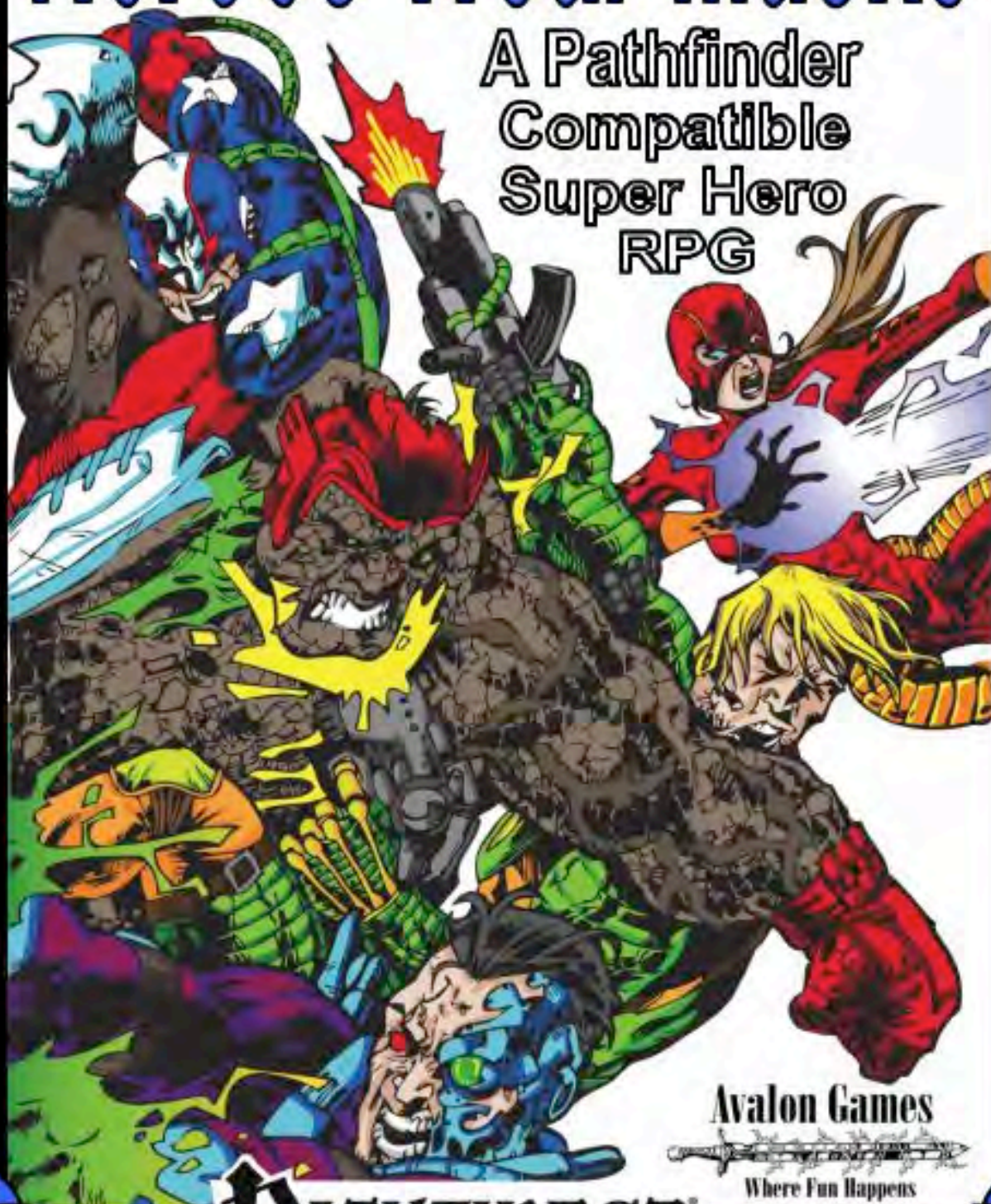


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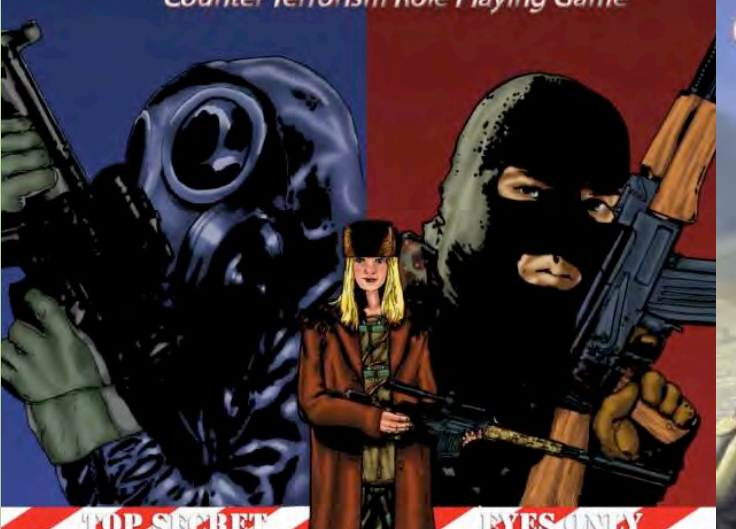
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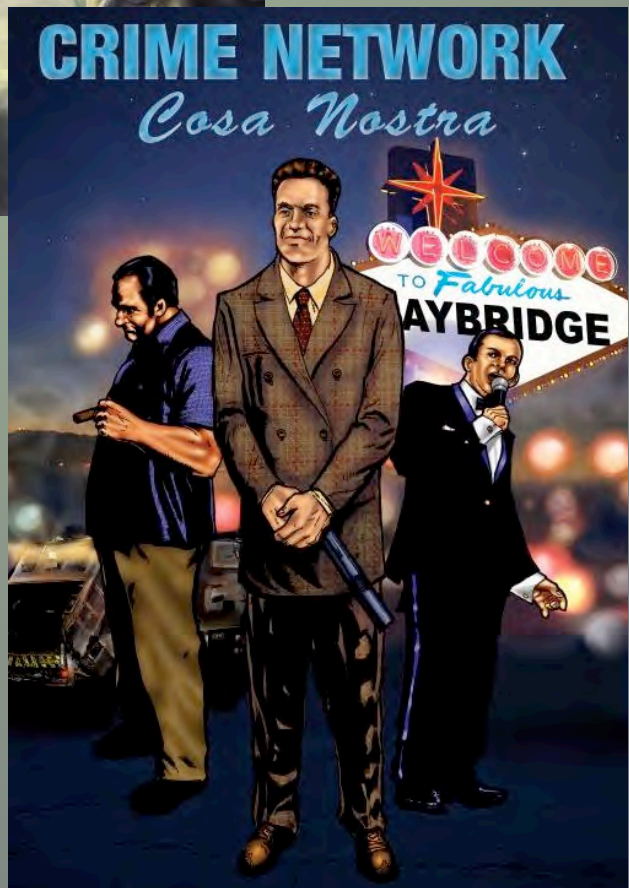
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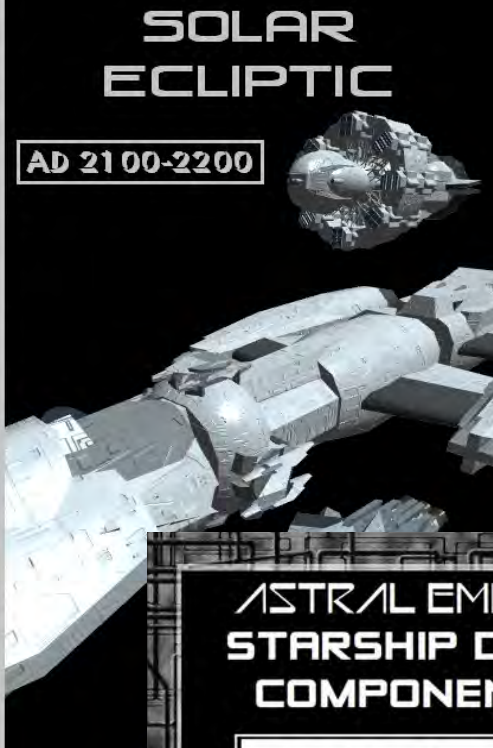
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