Space Combat Rules
By the Junction Crew

So, when two space fleets fight, how do you resolve it? Simple, by playing it out turn by turn.

The basics

All space combat takes place on an infinite hexgrid. If playing on a physical gameboard, get creative in order to approximate infinity.

Movement in this game is determined by *momentum*, not by position. All ships and guided weapons take two spaces on the hexgrid: one for their current location, and one for where they're *going* to be next turn if they stay on their current vector.

Needed dice: 1d3 and 1d20, for resolving critical hits. A d100 is also needed for rolling miss chance in certain circumstances, for checking if a shot hits a compromised section of armor, and for determining whether or not a critical hit occurs.

Recommended equipment for physical play: ship sheets, mechanical pencils, marked pawns corresponding to both future and present positions for all ships and guided weapon groups present.

Stage 0: Determine Objectives

Very rarely is the sole or even main objective of a fleet battle "destroy the enemy fleet". Indeed, with Jump Engines a fleet that doesn't want to fight can simply jump out and evade almost all realistic pursuit. So, what's the reason these ships are standing and fighting regardless? What's the objective here?

One of the most straightforward objectives is simply that one side wants to take this chunk of space and the other side wants it too. This produces an outcome fairly similar to a straight up "kill the other fleet" battle, as whoever has a credible fighting force in the area at the end of the battle can reasonably claim victory.

Another common option is a "VIP" mission. One side has something they're trying to defend and can't readily move; a shipyard, a valuable warship with a busted Jump engine, something like that. The other side wants to destroy it. Victory is determined by if the objective is still intact at the end of the battle, and if the defender managed to inflict enough casualties on the attacker to make the effort not worth it.

The last pre-suggested option is blockade running; one side has something they're trying to deliver safely to a specific location, and the other really doesn't want to let them do that. To prevent a tac jump from being an instant win, make victory not instantaneous by either having to defend the delivery ship for a while, or requiring multiple deliveries to win.

There's plenty more possibilities for objectives than that, be creative!

Stage 1: Deploy Ships

Place all agreed upon ships for both sides onto a hexgrid. Ships on opposing sides shouldn't start within each others' direct fire weapons range, but they also shouldn't be unreasonably far apart either. Agree on where any relevant objectives are before starting.

At this point, apply relevant morale modifiers to each side, based on the circumstances of the battle. These circumstantial modifiers affect the Target Morale Value, rather than simply adjusting the current Morale score.

Does your side's crew perceive their cause as just? +3 Morale.
Does your side's crew perceive their cause as *unjust?* -3 Morale.

Crew pay can also affect morale:
-Bad Pay inflicts -2 Morale
-Standard Pay provides +0 Morale
-Double Pay provides +1 Morale

Is your side fighting to defend something? +4 Morale
If fighting to defend something, are they fighting a superior force? +4 Morale

If attacking in this battle, is your side fighting a superior force? -4 Morale

Is your side fighting in friendly territory? +2 Morale

Is the ship starting battle with significant damage or resource depletion? -2 Morale

Is the ship a mix of Brainwashed and non-Brainwashed crew? -4 Morale
If not, is there another ship in the same fleet with Brainwashed crew? -2 Morale

Lastly, if any ships are using Photvoltaic Panels for energy generation, agree on the light level. This determines the volume per energy of said Photovoltaic Panels.

Stage 2: The Turn Order

Each turn occurs in three phases: the Firing Phase, the Maneuver Phase, and the Crew Phase. During each phase, orders are resolved simultaneously where not otherwise noted.

Firing Phase

First in the turn order is the firing phase, when direct-fire weapons are fired, guided weapons are launched or detonated, point defense takes place, and (most) hits are calculated.

Important Rule: Power Generation

At the start of this phase, set the ship's energy level to its current power generation capability as determined by its power plants. Remember to subtract the Rocket Fuel needed for energy generation if you're using Fuel Cells.

Generated energy does not persist between turns. Any energy not used is wasted.

Important Rule: ECM and Jamming

Before resolving *any* attack, compare the attacker's Sensors rating with the target's ECM rating. If the ECM rating is higher, the attacker is Jammed and has much greater odds of missing. ECM and Sensors both consume energy to use, so you must choose what level they're both turned to at the start of each firing phase; this includes turning them off completely.

Jammed direct fire attacks treat their Precision Targeting and Guaranteed Hit range brackets as their Probable Hit range bracket, gaining a 50% miss chance; they cannot use their Probable Hit range bracket under these circumstances. If ECM is at least ten higher than sensors, direct fire weapons also cannot use their Guaranteed Hit range bracket.

Light Guided Weapons have a Sensors rating of four by default, while Heavy Guided Weapons have a Sensors rating of 20. If Jammed, they *usually* gain a significant miss chance, depending on their guidance package. However, if exposed to any amount of ECM from the target, a Home On Jam missile is **guaranteed** to cause the "ECM Damaged" critical hit, ignoring all decoys.

When an ally is attacking a target with ECM, a ship with a Sensor Uplink may opt to assist said ally with the attack. Subtract the enemy's ECM from the assisting ship's Sensors rating to get the Assist Factor, then add that value to the ally's sensor rating for the purpose of attack resolution only. This only lasts until the end of the current Firing Phase. Per unit volume of Sensor Uplink, a ship can assist five allied ships or guided weapons per turn in this manner.

Stuff to Do: Guided Weapon Attacks

Guided weapons which have been previously launched on another turn may now activate their payloads, if appropriate. Kinetic missiles and nuclear bombs must be in the same hex as an enemy ship. Meanwhile NEFP, Excalibur, Light Gas Guns, or Chemical Lasers must be in range of an appropriate target. EM Deflectors and Decoys are passive. Documentation on what the various guided weapon payloads and guidance weapons do will be listed at the end of the combat rules.

Guided weapon launches and attacks both provoke point defense if within range of eligible enemy weapons.

A Guided Weapon that passed through a ship's current location during the last maneuver phase can attack that ship.

Stuff to Do: Point Defense

Ships and gun-armed guided weapons can attempt to shoot down enemy guided weapons before they manage to hit. Excalibur missiles can be launched and used in one action as point defense in this manner; direct fire weapons can also be used for point defense, provided they were not fired in any role aside from point defense last turn. Allied ships and may also contribute to Point Defense, provided that the guided weapon attack is taking place within Guaranteed Hit range of eligible weapons.

When used for point defense, Macron Guns can shoot targets equal to their Area Denial stat, while Lasers can shoot targets equal to their Redundant Emitters stat (minimum 1). Both these weapons divide their attack power by the number of targets engaged. The guided weapon must be within the Guaranteed Hit range of the weapon in question; in addition, Light Guided Weapons can only be hit from a maximum range of 15 hexes, while Heavy Guided Weapons can only be hit from a maximum range of 20 hexes.

If the attack power of the point defense is equal to or greater than the Durability of the guided weapon

in question, that guided weapon is destroyed before it can do any damage. Light Guided Weapons have 1 Durability, while Heavy Guided Weapons have 8 Durability. Kinetic missiles increase that to 3 and 24 Durability respectively.

Stuff to Do: Launch Guided Weapons

Next, all ships which are launching Guided Weapons this turn do so. Guided weapons start in the same hex as the ship which launched them. Weapons launched from a VLS always inherit the velocity of their launching ship, but ones launched from an electromagnetic catapult may have a change in velocity up to the catapult's rating applied.

A VLS could hypothetically fire all of its guided weapons in a single turn, but electromagnetic catapults have a fixed rate of fire.

If an Electromagnetic Catapult can make the future position marker for the guided weapon it's launching and the ship it's targeting match, and the guided weapon has a higher acceleration than the target, the EM Catapult can perform a Mass Driver attack. When performing a Mass Driver attack, record how much of the EM Catapult's velocity cap *wasn't* used to put the Guided Weapon on its collision trajectory.

Guided Weapons fired in a Mass Driver attack are committed to targeting the specific ship they were launched at. They cannot divert their course to hit another ship, though they *may* be ordered to miss and simply be removed from play. In exchange they get to apply the un-used velocity from the EM Catapult for the purpose of kinetic damage calculations.

Stuff to Do: Direct Fire Attacks

Aside from lobbing missiles at each other, ships have the ability to just use their guns and shoot each other. There are three direct fire weapon types available: Macron Guns, Lasers, and Particle Beams. All of them share a couple basic characteristics.

First is range brackets. All direct fire weapons share three range brackets: Precision Targeting, Guaranteed Hit, and Probable Hit.

Within Precision Targeting range, the attack has tripled odds of a critical hit, and the attacker can choose which chart crits are rolled on. Within Guaranteed Hit range, there is Within Probable Hit range there is a base 50% miss chance; hits impact a random location.

All direct-fire weapons on the same ship with identical type, attack power, and range have the ability to synchronize fire. When synchronizing fire, all shots are directed at a single hit location on the target ship, and sum their attack power together as if they were a single hit. Miss chance is still rolled individually for each shot, if applicable. Synch Fire is only available if within Precision Targeting range.

In addition, each type of direct fire weapon has a special ability.

Macron Guns have access to Area Denial as a secondary attack mode. When making an area denial attack, mark hexes within twice the weapon's Probable Hit range equal to the Area Denial stat. Any ship or guided weapon that passes through one of those hexes during the following maneuver phase takes a guaranteed hit, with the attack power divided by the number of hexes marked. All marked hexes from a single gun must be connected, and ships/guided weapons in motion are immune to marks on their starting hex. This ignores ECM.

A ship or guided weapon can skip over Area Denial hexes that were placed closer to their current position than half their total speed without taking damage. An object that ends its maneuver on an Area Denial hex takes damage regardless of how it was moving.

Lasers can have Redundant Emitters. If a laser with Redundant Emitters is hit, the laser loses one Redundant Emitter and the hit location is re-rolled. Yes, this can hit the laser again. A particle beam capable of piercing the armor over the laser ignores this particular defense. In addition, a laser can attack multiple targets up to its Redundant Emitters stat, dividing its attack power between them.

Particle Beams have an Armor Penetration rating. When attacking a target with armor, the armor's protection rating is treated as lower by a percentage equal to the Armor Penetration rating. The effective protection rating is rounded up to the nearest whole integer. If all the target's crew spaces and command modules have at least Light Radiation Shielding, the AP rating is treated as 25% lower. Universal coverage with Heavy Radiation Shielding intensifies the reduction to 40%.

Stuff To Do: Interdiction

Jump Drives can also be used to disrupt Jump Space, preventing nearby ships from performing Tactical Jumps. Spend Energy up to the maximum your Jump Engine can use, gaining one Interdiction Strength per unit of Energy spent. Interdiction Strength lasts for one turn.

Each point of Interdiction Strength makes all ships treat their Jump Rating as one rank lower. Interdiction Strength decreases by one for every squaring of distance (1, 4, 9, 16, 25...) between the interdicting ship and the jumping ship. A ship needs an effective jump rating of one or higher to perform a tactical jump.

Ships coming *out* of a jump arrive on the nearest hex to their destination where their effective Jump rating would be one or higher.

Interdiction of any strength resets all progress on performing a non-combat jump.

Important Rule: Armor, Damage, and Critical Hits

Ships have three characteristics that affect how they respond to an attack: Their Armor Value, their Protection Rating, and their Integrity Score.

When a ship takes a hit, the armor's Protection Rating is subtracted from that attack's Attack Power. This absorbed attack power is subtracted from the ship's Armor Value, while anything left over is subtracted from the ship's Integrity Score. A ship that reaches zero or negative Integrity is destroyed, and can no longer participate in battle.

If the ship's Armor Value isn't at its designed maximum, there's a percent chance – equal to the percentage of Armor Value missing – that the attack hits a compromised section of armor. Said attacks treat the ship as completely unarmored, with the full value of the Attack Power being subtracted from the ship's Integrity and no further Armor Value being lost.

Any attack that affects a ship's Integrity Score has a chance of becoming a Critical Hit. For each percentage point of a ship's Integrity Rating that the attack had in post-armor Attack Power, there is a 10% chance of getting a Critical Hit. Round up.

If critical hit chances exceed 100%, that converts to a number of guaranteed crits equal to full multiples of 100% crit chance, and an additional possible crit using the last two digits of total crit chance as its crit odds.

Critical hits are rolled on the three critical hit tables listed in Appendix 2. Normally, which table a critical hit is rolled from is randomly selected with a three-sided die. However, under certain circumstances an attacker can *choose* which critical hit table a crit is rolled on. Direct fire weapons within Precision Targeting range can choose whichever crit table the attacker wants, while certain Guided Weapon guidance options selectively hit on a specific crit table.

Important Rule: Hazardous Propellants

Chemical Rocket Fuel and Dissolved Fissiles are Hazardous Propellants. If your ship uses either of these propellants and you fall victim to the Propellant Leak critical hit, there are additional nasty effects.

For both propellants, an additional critical hit is rolled on a random table. This represents where the ship's propellant is leaking *to*. Instead of the normal effects, both sorts of propellant leak cause other issues.

Both sorts of Hazardous Propellant Leak will severely worsen another Critical Hit that impacts their affected area. If another critical hit impacts the area, the following occurs:

-Any and all Repair Point costs are doubled
-Magazine hits cause 35% of loaded Guided Weapons to be lost instead of 25%
-Command Hits paralyze the ship's ability to fire and maneuver for a turn
-Any and all Personnel Table crits have their casualties increased by 20%, stacking additively.

Fixing the Propellant Leak via Damage Control removes these risks.

Dissolved Fissiles are even more dangerous, carrying an additional risk. Regardless of whether their leak location receives another critical hit, it now has a Criticality Countdown. This gives you two turns to clean up all the leaked nuclear material before it goes critical. While the propellant leak is ongoing, the amount of Repair Points needed to clean up the mess goes up by one each turn per two Volume of Dissolved Fissiles tank, rounding up.

Cleaning up all of the leaked propellant resets the countdown, even if the propellant leak is ongoing.

A leakt going critical immediately triggers the associated critical hit effect, with the following modifications:
-No amount of Repair Points will remove a negative effect inflicted by Criticality.
-A Magazine or VLS subjected to Criticality loses all its munitions.
-Command modules going critical paralyzes the ship's ability to fire and maneuver for a turn
-Casualties from a crew section going critical are 90%.
-If Criticality inflicts a *propellant leak*, the entire ship is immediately destroyed in a nuclear explosion.

Maneuver Phase

Important Rule: Acceleration & Delta V

For the most part, this game is based on momentum for movement; each ship, guided weapon, and other mobile object has a momentum vector, and moving along it each turn costs no resources. Changing this vector costs a resource labeled Delta V, which each ship and guided weapon has a finite amount of. Each hex per turn that a ship or guided weapon changes its vector by subtracts one point of Delta V from the ship or guided weapon's reserve.

Each propellant tank has its contribution to a ship's Delta V reserve listed; when spending Delta V, chose which propellant tank you're withdrawing from. If a propellant tank is destroyed you lose all the propellant it contains, obviously.

Stuff To Do: Ship Maneuver

At this point, ships may adjust their vector by spending Delta V to accelerate, up to their acceleration rating. Move all ships to the current location of their future position indicator, and move the future position indicator to correspond to their new vector. Pay attention, ships using an Electric or Thermo-Electric Rocket for propulsion need Energy to provide acceleration!

Stuff To Do: Tactical Jumps

If a ship has a functioning Jump Engine and the energy to spend on it, they may perform a tactical jump. Ships performing a tactical jump may either retreat from battle, or select any destination hex within the battle to jump to. Write down either an indication of retreat or the *exact* destination hex, and place it face down; the idea is to make sure your opponent knows you haven't changed it, while making sure *you* know they haven't looked at it. Jump destinations are the *only* piece of hidden information in the entire game.

The jumping ship is now removed from play for a number of turns determined by the variety of Jump Engine it is fitted with. Once the specified number of turns has passed and the Jump phase is reached, the jump's destination is revealed. If the ship retreated, it does not reappear; otherwise it is placed on the specified destination hex, with its momentum vector unchanged from before the Jump.

Turns Used	*Engine Type(s)*
5	*Interdictor*
4	*Long-Range*
3	*Rudimentary, Industrial*
2	*Standard*
1	*Tactical*

So long as a ship has at least a tenth of the needed energy it can *technically* initiate a Jump, spending energy towards the total amount needed. When slow-charging a Jump in this manner, a ship cannot accelerate without spoiling the partially-charged Jump. As such, this is not recommended outside desperate attempts to flee from battle.

Stuff To Do: Guided Weapon Maneuver

Players may now adjust the trajectory of their Guided Weapons. They maneuver in much the same way as ships, except that they lack specific propellant tanks to withdraw their Delta V from. Guided Weapons with solid fuel propulsion may only accelerate during a single turn, even if they don't use all their Delta V. This happening at the end of the Maneuver Phase is to allow attack trajectories against ships to respond to those ships' maneuvers.

Important Rule: Threat Zones

If the vector of a guided weapon or ship passed through enemy weapons range *as of the end of the maneuver phase,* the guided weapon or ship in question is added to that weapon's eligible target list during the next firing phase, using the most accurate range bracket the object traveled through.

On a similar note, guided weapons who's straight-line trajectory pass through a ship's hex can attack that ship during the next firing phase.

Crew Phase

Important Rule: Morale Changes

All ships have a Target Morale Value, determined by crew accommodations, crew pay, crew training, and the circumstances of the battle. Ships start the battle at this Target Morale Value, and their current Morale Score will increase or decrease towards this Target Value at a rate of 1 per turn. Destruction of Crew Accommodations doesn't affect Morale until *after* the battle.

Aside from that, there are several events which can affect crew morale during battle. They are divided into two categories: Things that affect Morale fleet-wide, and things that only affect a specific ship. Morale changes that have been **bolded** and marked with an exclamation point (!) modify a ship's Target Morale Value until the event's conditions are no longer met; this doesn't take effect immediately, drifting at the normal rate of 1 per turn.

Fleet-Wide Event	Morale Change	Ship-Specific Event	Morale Change
Friendly Ship Loses Power	-1	Failed Resolve Check	-3
Friendly Ship Immobilized	-1	Main Weapons Offline	**-2!**
Friendly Ship Retreats Without Orders	-3	Propulsion Offline	**-2!**
Friendly Ship Surrenders	-1	No Power	**-3!**
Friendly Ship Destroyed	-2, -3	Main Weapons Repaired	+3
Friendly Ship Restores Power/Mobility	+2	Power Restored	+3
Enemy Ship Loses Power	+1	Mobility Restored	+3
Enemy Ship Immobilized	+1		
Enemy Ship Retreats	+1		
Enemy Ship Surrenders	+2		
Enemy Ship Destroyed	+2, +3		

For "Ship Destroyed" events, the +/- 3 version applies if the ship in question has more than 700 Volume. Ships crewed entirely by Automata reduce the morale *penalty* for their destruction by 2, but still give the full morale *bonus* for their destruction.

Automaton and Brainwashed Crew have their Morale permanently locked at +2 or +0 respectively, regardless of circumstance.

Stuff To Do: Resolve Check

Each turn, ships with negative Morale have a chance to lose their will to continue fighting. Roll 1d20 modified by the ship's current Morale score; if the rolled value equals or exceeds the DC, the check is a success. Resolve Check DCs vary by the circumstances of the battle. If the ship is on the winning side, the DC is 5. If the ship is on the losing side, the DC is 15. If it's unclear, the DC is 10.

Aside from the Morale penalty for failing a Resolve check, failing a Resolve check when at -6 or lower Morale will result in the ship retreating from battle via Jump if capable of doing so.

If retreat *isn't* possible and a ship fails a Resolve check at -9 or lower Morale, the ship will surrender. A surrendered ship will not participate in the firing or maneuver phases, aside from drifting along their current momentum vector.

It is *possible* to make a surrendered ship rejoin the fight, but it's a very bad idea. If a surrendered ship is attacked, the ship rejoins the battle *against* whatever side shot them, with their Morale immediately being set to +6. As an additional consequence, shooting a surrendered ship means no other ships will surrender to your faction for the remainder of the battle. There's no point to surrendering if the enemy will just shoot you anyway, after all.

Ships crewed entirely by Automaton or Brainwashed crew do not need to make Resolve checks; they lack the required free will.

Stuff To Do: Combat Stations

There are a number of useful things a warship's crew can do during combat to enhance its abilities in a fight. Temporarily enhancing a ship's engines via careful overloading, improving the performance of a ship's Ewar capabilities, rescuing and healing wounded crew members, and repairing a ship's damaged systems. These tasks are performed by assigning crew to C*ombat Stations*, duties which provide a benefit to the ship depending on the crew assigned to them and the morale of said crew.

Combat Stations	Crew & Morale needs by Level	Effect:
Damage Control	Lv. 1: 10 Crew Lv. 2: 25 Crew, 2+ Morale Lv. 3: 50 Bio/Const Crew, 4+ Morale Lv. 4: 50 Bio + 50 Const Crew, 6+ Morale	Lv. 1: +1 Repair Point per 10 crew assigned Lv. 2: +3 Repair Points per 25 crew assigned Lv. 3: +7 Repair Points per 50 crew assigned Lv. 4: +15 Repair Points per 100 crew assigned
Engineering	Lv. 1: 10 Crew Lv. 2: 25 Crew, 2+ Morale Lv. 3: 25 Bio/Const + 25 Info Crew, 4+ Morale Lv. 4: 50 Bio/Const +50 Info Crew, 6+ Morale	Lv. 1: +1 Acceleration[1] Lv. 2: OR +10% Energy Lv. 3: OR +10% Delta V Lv. 4: All of the above
Nerve Center	Lv. 1: 10 Crew Lv. 2: 25 Crew, 2+ Morale Lv. 3: 50 Info/Const Crew, 4+ Morale Lv. 4: 100 Info Crew, 6+ Morale	Lv. 1: +1 ECM or Sensors Lv. 2: +2 ECM or Sensors Lv. 3: +3 ECM **and** Sensors Lv. 4: +4 ECM **and** Sensors
Medbay	Lv. 1: 10 Crew Lv. 2: 25 Crew. 2+ Morale Lv. 3: 25 Bio + 25 Info Crew, 4+ Morale Lv. 4: 50 Bio + 50 Info Crew, 6+ Morale	Lv. 1: Heal 5 WIA Crew per 10 crew assigned Lv. 2: Heal 14 WIA Crew per 25 crew assigned Lv. 3: Heal 32 WIA Crew per 50 crew assigned Lv. 4: Heal 75 WIA Crew per 100 crew assigned
Medevac Route	Lv. 1: 2% of crew Lv. 2: 4% of crew, 2+ Morale Lv. 3: 8% of crew, equal Const & Info, 4+ Morale Lv. 4: 16% of crew, equal Const & Info, 6+ Morale	Improves WIA/KIA Ratio Lv. 1: 60:40 Lv. 2: 70:30 Lv. 3: 80:20 Lv. 4: 90:10

1 *All acceleration buffs require that the ship have at least Acceleration 1 under its own power.*

Command Modules

Command Modules are what allows a ship to coordinate actions and fight effectively; if all of a ship's Command Modules are destroyed or uncrewed (for warship CICs and Civilian Bridges), then the ship is incapable of acting during the Firing and Maneuver phases. Civilian Bridges need 6 Crew to operate, while Warship CICs need 20 Crew to operate.

Civilian Bridges are incapable of operating any weaponry or ECM.

Shipminds have several differences in performance to a Warship CIC. Firstly, they provide +2 to ECM and Sensors, along with +1 to Acceleration. This stacks with the benefits provided by the relevant Combat Stations. They additionally reduce the energy cost for combat jumps (but not slow-charge jumps) by 10%.

In circumstances where the ship is under attack and a hit isn't guaranteed, a Shipmind improves the odds of a miss by 10%. This is increased by a further 5% for each point of Morale above zero.

Lastly, the presence of a Shipmind doubles the penalty for negative Morale during Resolve checks.

Stuff To Do: Damage Control

Generate Repair Points according to the number and level of the ship's Damcon rooms. These Repair Points can now be spent to reactivate disabled components and fix Dissolved Fissiles leaks.
As a reminder:

The Repair Point cost for a disabled component is four when disabled at 4 Integrity Points, eight when disabled at 2 Integrity Points. A Chemical Fuel leak increases this cost by 3 Repair Points.

Criticality Countdowns decrease by 2 per turn, and do **VERY** bad things at zero. Increasing them costs Repair Points on a 1:1 basis. If raised to eight, they go away.

Stage 3: End of Battle

Battles can end with the mutual consent of all players at any time. Battles also end if all ships belonging to all but one side have either retreated, surrendered, or been destroyed.

Appendix 1: Guided Weapon Parts

Guidance	Price	Performance Notes
Heat Seeking	0.1/1	Always rolls its crits on the Power table, with three times crit chance. If jammed, rolls crits on random tables, with normal crit odds and a 50% chance of missing completely.
Home On Jam	0.1/1	If the target ship has ECM active, always causes the "ECM Damaged" critical hit regardless of ECM rating or crit rolls. Otherwise it always misses.
Imaging Radar	0.1/1	Always rolls its crits on the Systems table, with three times crit chance. If jammed, rolls crits on random tables, with normal crit odds and a 50% chance of missing completely.
Center of Mass	0.1/1	Rolls its crits on random tables. If jammed, 75% chance of hitting normally anyway, 25% chance of missing completely.
Remote Guidance	0.1/1	Rolls its crits on whatever table you want it to. If jammed, has a 25% chance of hitting randomly, with a 75% chance of missing completely.

Payloads	Type	Price	Usage
Kinetic	Warhead	Free	**Light:** Passively increases missile DUR to 3. Can attack ships in the same hex, with Attack Power equal to the relative velocity squared. **Heavy:** Passively increases missile DUR to 24. Can attack ships in the same hex, with Attack Power equal to eight times the relative velocity squared. Kinetic missiles killed by Area Denial don't count as destroyed until the end of the next firing phase. If such missiles weren't jammed (or were jammed and had Home on Jam) they have 80% odds of hitting normally. If they *were* jammed, they miss.
Inertial Mine	Warhead	0.1/1	An Inertial Mine is a variant of kinetic payload; it lacks the increased durability and cannot delay destruction from area denial. In exchange, it has a second attack mode. In this attack mode, the Inertial Mine hits every ship or Guided Weapon in the same hex as it with Attack Power a tenth of its normal value at current velocities. This targets random hit locations when attacking ships. This counts as Area Denial as far as Kinetic Missiles are concerned. Multiple Inertial Mines used in the same hex during the same phase stack their Attack Power, instead of interfering with each other. Missiles fitted with Inertial Mines can be fired as point defense, even if not launched before the firing phase on which it is needed. Inertial Mines used for point defense in this manner can only affect Guided Weapons that started their turn in the same hex as each other. This *still* counts as Area Denial, as far as Kinetic Missiles are concerned.

Nuclear Bomb	Warhead	0.6/5	**Light:** Can attack a ship in the same hex, hitting with 200 Attack Power. If a miss is induced by ECM, it does no damage. **Heavy:** Can attack a ship in the same hex, with 2000 Attack Power. Other units in the same hex are damaged as if hit by a Light Nuclear Bomb. Both sizes of nuclear bomb automatically deal ten times their normal Attack Power to a ship's Armor Value, regardless of what the armor's Protection Rating is. Missiles fitted with Heavy Nuclear Bombs can be fired as point defense, even if not launched before the firing phase on which it is needed. Heavy Nuclear Bombs used for point defense in this manner can only affect Guided Weapons that started their turn in the same hex as each other. If the targeted salvo contains Guided Weapons with Chemical Lasers or Light Gas Guns, those units can attempt to shoot down the defensive nukes.
Neutron Bomb	Warhead	0.8/6	Neutron Bombs can attack a ship in the same hex. If that ship is completely unarmored, all crew are killed, and all command modules are destroyed. Armor protection converts these automatic kills to regular Casualties at a rate of 1% per Protection Rating for Light Neutron Bombs, and 1% per 3 Protection Rating for Heavy Neutron Bombs. Once 100% of automatic kills have been converted to regular Casualties, further protection negates Casualties at the same rate. The ship's effective Protection Rating is reduced by the percentage of the ship's Armor Value that has been compromised. Radiation Shielding applied to components is not affected by this reduction. At 50% regular Casualties, Shipminds are only disabled instead of destroyed, needing 2 Repair Points to reactivate. At 50% Casualty Negation, Shipminds are unharmed. Heavy Neutron Bombs affect other ships in the same hex as if they were directly hit with a Light Neutron Bomb. They also destroy all other Guided Weapons in the same hex. Missiles fitted with Heavy Neutron Bombs can be fired as point defense, even if not launched before the firing phase on which it is needed. Heavy Neutron Bombs used for point defense in this manner can only affect Guided Weapons that started their turn in the same hex as each other. If the targeted salvo contains Guided Weapons with Chemical Lasers or Light Gas Guns, those units can attempt to shoot down the defensive nukes.

Casaba Howitzer	Warhead	0.8/6	**Light:** Gives the guided weapon a one-shot direct fire attack with a range of 5/8/10, provoking point defense if within those weapons' Guaranteed Hit range. A Light Casaba Howitzer hit has 850 Attack power. **Heavy:** Gives the guided weapon a one-shot direct fire attack with a range of 8/12/16, provoking point defense if within those weapons' Guaranteed Hit range. A Heavy Casaba Howitzer hit has 8,000 Attack power.
Nuclear Explosively Formed Penetrator (NEFP)	Warhead	1/7	**Light:** Gives the guided weapon a one-shot direct fire attack with a range of 1/3/5, provoking point defense if within those weapons' Guaranteed Hit range. Each 150 volume the target ship has increases range by +0.5/+0.75/+1. A Light NEFP Hit has 4,000 Attack power. **Heavy:** Gives the guided weapon a one-shot direct fire attack with a range of 1/3/5, provoking point defense if within those weapons' Guaranteed Hit range. Each 150 volume the target ship has increases range by +1/+1.5/+2. A Heavy NEFP Hit has 36,000 Attack power.
Bomb-Pumped X-Ray Multiple Laser (Excalibur)	Warhead	1.2/8	**Light:** When used, this warhead has 20 total Attack power, divided between any number of targets within 10 hexes. **Heavy:** When used, this warhead has 180 total Attack power, divided between any number of targets within 16 hexes. A missile fitted with an Excalibur warhead can be used for Point Defense, even if not launched before the firing phase on which it is needed.
Decoy	Module	0.3/4	If this drone is in the same hex as a friendly ship currently being attacked and the attacker is jammed, the attack's target is chosen randomly between the ship and all applicable decoys. This does not work against Home On Jam missiles. Light Decoys only work for ships of 300 signature or less, while Heavy Decoys only work for ships of 800 signature or less. Decoys can also be fired as part of a guided weapon salvo; in this role, enemy point defense will always prioritize the Decoys. For this purpose, Light Decoys have DUR 4 and Heavy Decoys have DUR 32. Indiscriminate attacks (such as Nuclear Bombs, Area Denial, or Inertial Mines) are not distracted by Decoys, nor do they treat the Decoy has having increased Durability compared to regular Guided Weapons.

EM Deflector	Module	0.5/4	EM Deflector drones redirect particle beams; this can be used for defending against enemy particle beams, and to curve your own beams around the enemy's deflector drones. To force an enemy particle beam to miss, the EM Deflector Drone must be positioned directly on the straight line between the attacker and the ship being defended. EM Deflectors have a base deflection chance, which improves based on the distance between the drone and the ship it's defending. For Light Deflectors, it's 30% + 5% per hex. For Heavy Deflectors, it's 50% + 10% per hex. In all cases, subtract the beam's Armor Penetration rating from the deflect chance. Additional EM deflectors in line with the beam path modify the deflection chance; Light Deflectors adjust the odds by ± 10%, while heavy deflectors adjust the odds by ± 25%. Defending EM Deflectors raise the deflection chance, while those belonging to the attacker lower the deflection chance. Any enemy EM deflector eliminates the precision targeting crit multiplier and table-selection ability, regardless of if a miss is forced or not.
Light Gas Gun	Module	0.3/3	**Light:** Gives the guided weapon a reusable direct-fire attack with a range of 1/2/3, provoking point defense if within those weapons' guaranteed hit range. This weapon has 2 Attack Power, and can be used for Area Denial targeting a single hex. **Heavy:** Gives the guided weapon a reusable direct-fire attack with a range of 1/2/4, provoking point defense if within those weapons' guaranteed hit range. This weapon has 16 Attack Power, and can be used for Area Denial targeting a single hex.
Chemical Laser	Module	0.3/3	**Light:** Gives the guided weapon a reusable direct-fire attack with a range of 3/5/7, provoking point defense if within those weapons' guaranteed hit range. This weapon has 1 Attack Power. **Heavy:** Gives the guided weapon a reusable direct-fire attack with a range of 4/7/10, provoking point defense if within those weapons' guaranteed hit range. This weapon has 8 Attack Power.

Laser Relay	Module	0.5/4	Laser Relays can be targeted by friendly laser beams. Instead of being destroyed, they may then use the attack power from those lasers to perform their own laser attacks. Laser Relays may combine laser power from up to four sources, and divide it between up to four targets. Shipboard lasers and chemical laser modules are compatible with laser Relays, Excalibur missiles aren't. Laser Relays may target other Laser Relays in a chain. Targeting Laser Relays is subject to the normal range restrictions on targeting guided weapons. Laser relays cannot form closed loops, and cannot store laser power between turns. **Light:** Light Laser Relays have a range of 10/15/25. They can handle a total of 100 Laser Attack Power. **Heavy:** Heavy Laser Relays have a range of 15/25/35. They can handle a total of 650 Laser Attack Power.
Missile Rack	Module	1/3	A Missile Rack acts like a VLS mounted to a Guided Weapon, enabling them to launch additional Guided Weapons. If the drone is retrieved, its missile racks can be reloaded. **Light:** Can hold six mini-missiles. These mini-missiles maneuver like they have a Solid Rocket Motor, and use the Kinetic Missile damage formula with a multiplier of x0.1. The mini-missiles are treated as having Center-of-Mass Guidance. They have one Durability, and no ability to penetrate Area Denial. Mini-missiles don't need to be tracked for resupply purposes. **Heavy:** Can hold four Light Guided Weapons. These are full-fledged Guided Weapons, built according to the normal rules. The carrier must have sufficient Light Guided Weapons in magazines to replenish its drone's stocks.

Propulsion Segment	Acceleration	Delta v	Price	Notes
Solid Rocket Motor	20	20	0.1/1	Can only be used during one turn
Liquid Fueled Rocket	18	30	0.2/2	
Nuclear Thermal	14	56	0.6/6	
Nuclear Thermo-Electric Hybrid	12	84	1/10	

Appendix 2: Critical Hit Charts

Any attack that gets through a ship's armor has a chance of becoming a Critical Hit. For each percentage point of a ship's Integrity Rating that the attack had in post-armor Attack Power, there is a 10% chance of getting a Critical Hit. Round up.

If critical hit chances exceed 100%, that converts to a number of guaranteed crits equal to full multiples of 100% crit chance, and an additional possible crit using the last two digits of total crit chance as its crit odds.

Critical hits are rolled on the following three tables, selecting which table randomly using a three-sided die, then selecting randomly from within that table using a twenty sided die. The exact proportions of these critical hits within each table vary based on the design of the ship, so won't be listed here.

Table 1: Power	Repair Points to Fix	Effect
Propellant Leak	1 per 3 total volume of Propellant Tank	Lose 5% of your maximum Delta V each turn until repaired. Certain propellants have worse leaks. Orion Drive bombs and Fissile Pellets only have a one-time loss of 5% max propellant, without an ongoing leak.
Radiators Damaged	1 per total volume of power plant	-50% total Energy production until repaired. Multiple crits of this type stack multiplicatively.
Reactor Offline	2 per volume of power plant disabled	One of your largest power plants stops generating Energy until repaired.
Engine Offline	2 per volume of drive disabled	One of your largest drives stops generating Thrust until repaired.
Jump Offline	2 per volume of Jump Drive disabled	One of your largest Jump Drives cannot be used until repaired.

Table 2: Systems	Repair Points to Fix	Effect
Sensors Damaged	1 per total Sensor volume	-50% Sensor rating until repaired. Multiple crits of this type stack multiplicatively.
ECM Damaged	1 per total ECM volume	-50% ECM rating until repaired. Multiple crits of this type stack multiplicatively.
Weapon Disabled	2 per volume of weapon disabled	One of your largest weapons can't be fired until repaired. If that weapon is a VLS, you also receive the effect of a Magazine Hit.
Magazine Hit	Not Repairable.	Lose 25% of loaded Guided Weapons.
Command Hit	Not Repairable.	One of your Command Modules is destroyed. All personnel manning said module become Casualties.

Table 3: Personnel	Effect
Hull Breach: Damcon	30% of Crew assigned to Damage Control become Casualties
Hull Breach: Medevac	50% of Crew assigned to Medevac become Casualties
Hull Breach: Medbay	50% of Crew assigned to the Medbay become Casualties
Hull Breach: Engineering	50% of Crew assigned to Engineering become Casualties
Hull Breach: Nerve Center	50% of Crew assigned to the Nerve Center become Casualties