COMBAT SYSTEM PROPOSAL

The Weapons of Space Engineers 2

Condensed and reorganized edition. All weapon categories, proposed values, support systems, balancing mechanics, tactical roles, internal risks, and core design principles from the original proposal are retained. Repetition and duplicate weapon tables have been consolidated.

1. Purpose and Core Design Goal

1.1 Why Weapons Matter

Space Engineers 1 gradually gained more weapons, ammunition types, and combat blocks, but for years there was little meaningful content to use them against beyond player-built ships, scenarios, and basic pirate encounters. Later advanced encounters and Prototech-style content improved this by giving players a reason to enter dangerous areas, fight stronger enemies, recover valuable technology, and build around a clear objective.

Weapons in Space Engineers 2 should therefore support more than combat for its own sake. They should drive progression, missions, encounter variety, risk, logistics, ship specialization, and purposeful engineering. Without pressure, progression can become a loop of gathering resources, building larger machines, and gathering faster. Combat adds reasons to design armor, sensors, countermeasures, redundancy, interior security, ammunition systems, and ships with distinct tactical roles.

The goal is not simply to build a larger miner, cargo ship, or decorative capital ship. A strong combat system should make players solve design problems: what they are fighting, how it is armored, how visible it is, whether it can detect or board them, whether it can be disabled or captured, and which weapons and utilities are required to survive.

1.2 NPC Pathfinding, Boarding, and Interior Combat

Proper first-person NPC pathfinding would be a major force multiplier for the entire combat system. Traditional games use manually authored navigation meshes inside fixed levels. Space Engineers is different because players construct the ships, stations, corridors, doors, stairs, hangars, and rooms. If NPCs can dynamically navigate player-built blocks and voxel terrain, they would not be limited to scripted arenas.

- Hostile NPCs could board player ships, and players could board enemy ships.
- Crew compartments, corridors, doors, airlocks, stairways, and interior turrets would become functional combat features rather than decoration.
- Ships could be disabled, entered, cleared, captured, repaired, or destroyed from within.
- Exterior combat and interior security would become connected design problems.

Combined with radar, scanning, signatures, stealth, armor behavior, countermeasures, and detailed damage, combat becomes a question of tactics rather than only damage per second: "How do I fight this in the smartest way possible?"

1.3 Weapon Ecosystem Principles

Weapons should have clear jobs, strengths, weaknesses, and tactical purposes. They should influence how ships are built, fought, defended, disabled, captured, repaired, and supplied. A heavily armored cruiser should not always be defeated the same way: railguns or artillery may penetrate armor; repeating cannons may strip exposed systems; missiles or torpedoes may overwhelm defenses; Gatling CIWS and flak may stop drones and munitions; stealth may enable a close approach; and boarding may capture the ship without destroying it.

Roles must not overlap to the point that one block replaces an entire category. A Gatling CIWS is not artillery; flak is not a railgun; a repeating cannon is not a battlecannon; an unguided rocket turret is not a guided missile launcher; laser defense should not replace all point defense; and a heavy battlecannon should be a major ship or station system, not merely a larger turret.

2. Weapon Roster and Grid Rules

The detailed roster is organized into two configuration groups: fixed weapons and turreted weapons. Fixed weapons use compact grid-size labels so small- and large-grid variants can share one entry instead of repeating nearly identical tables. Small fixed weapons reward pilot aim and craft orientation; large fixed weapons reward hull alignment, forward armor, internal support, and ship orientation. Turrets provide coverage and tracking flexibility but should not replace stronger fixed weapons.

Scope clarification: the original introduction mentions small turreted weapons while also stating that small turrets are removed. Because no small-grid turret roster is provided, the turret section remains large-grid only. Fixed weapons are labeled Small, Large, or Small / Large where both sizes are proposed.

2.1 Fixed Weapons

Weapon / Grid Size	Munition	ROF	Accuracy	Primary Role
Gatling Cannon / Gatling Gun **SMALL / LARGE***	30 mm	1,800 rpm	Accurate	Light fixed kinetic weapon for fighters, drones, compact craft, and a proposed large-grid forward mount.
Decoy / Chaff Launcher **SMALL / LARGE**	Chaff / flare cartridge	N/A	N/A	Defensive countermeasure against guided missiles and torpedoes.
Flechette / Canister Cannon **SMALL**	Flechette / canister shot	TBD	Inaccurate	Close-range scatter weapon.
Rocket Launcher **SMALL / LARGE**	70 mm rocket	200 rpm	Inaccurate	Unguided explosive attack and saturation-fire weapon.
Autocannon **SMALL / LARGE**	50 mm	450 rpm	Accurate	Medium fixed cannon for light armor, exposed systems, fighters, gunships, corvettes, and armored rovers.
Recoilless Cannon **SMALL**	Heavy shell	TBD	Accurate	Compact heavy direct-fire weapon.
Reloadable Rocket Launcher **SMALL**	70 mm rocket	200 rpm	Inaccurate	Sustained reloadable rocket weapon.
Bomb Rack / Bomb Bay **SMALL / LARGE**	Bomb payload	N/A	Inaccurate	Planetary, gravity-assisted, or station-attack payload; rack-mounted on small craft or internally housed on large grids.
Guided Missile Rack / Launcher **SMALL / LARGE**	70 mm guided missile	200 rpm	Accurate after launch	Precision explosive strike weapon.
Railgun **SMALL / LARGE**	Railgun sabot	TBD	Accurate	Long-range precision penetrator; the large version serves as a spinal weapon for deep armor.
Drone Munition Rack / Launcher **SMALL / LARGE**	Expendable drone	N/A	Accurate after launch	Deploys loitering attack munitions for harassment or precision strikes.
Assault Cannon **SMALL / LARGE**	90 mm	600 rpm	Inaccurate	Heavy fixed cannon for gunships, attack rovers, and closer anti-ship work.
Light Torpedo Rack **SMALL**	Light torpedo	TBD	Accurate after launch	Small-grid anti-ship payload.
Artillery Cannon **LARGE**	120 mm AP	3 rpm	Accurate	Long-range fixed armor-piercing cannon.
Heavy Torpedo Launcher **LARGE**	Heavy torpedo	TBD	Accurate after launch	Powerful, detectable, interceptable capital anti-ship launcher.
Large Laser Cannon **LARGE**	No physical ammunition	N/A	Accurate	Spinal hard-science-fiction energy weapon for exposed systems and subsystem damage.

**The original progression listed a Large Fixed Gatling Cannon that was absent from the detailed large-fixed roster. It is retained here as a proposed large-grid variant pending confirmation.*

2.2 Turreted Weapons

Weapon (Large Grid)	Munition	ROF	Accuracy	Primary Role
Interior Turret	7.62 mm	800 rpm	Inaccurate	Anti-personnel and anti-boarding interior defense.
Gatling CIWS Turret	30 mm	1,800 rpm	Accurate	Point defense and area defense against missiles, drones, and light craft.
Autocannon Turret	50 mm	450 rpm	Accurate	Anti-fighter, anti-gunship, and exposed-system defense.
Flak Turret	40 mm flak	600 rpm	Inaccurate	Airburst area defense against swarms and fast targets.

Weapon (Large Grid)	Munition	ROF	Accuracy	Primary Role
Laser Defense Turret	No physical ammunition	N/A	Accurate	Short-range power-based precision interception.
Assault Cannon Turret	90 mm	600 rpm	Inaccurate	Heavy medium anti-ship turret.
Rocket Turret	70 mm rocket	200 rpm	Inaccurate	Unguided explosive saturation.
Repeating Cannon Turret	105 mm HE	120 rpm	Inaccurate	High-rate HE suppression and exterior stripping.
Artillery Turret	120 mm AP	3 rpm	Accurate	Slow long-range armor penetration.
Railgun Turret	Railgun sabot	60 rpm*	Accurate	Four light railguns on a turret for precision kinetic fire.
Battlecannon Turret	200 mm AP / APHE	2 rpm	Accurate	Capital anti-ship turret.
Heavy Battlecannon Turret	350 mm AP / APHE	1 rpm	Accurate	Super-heavy battleship, station, and siege weapon.

*The detailed table in the original lists the Railgun Turret at 60 rpm, while its later role description lists 0.5 rpm. Both values are preserved as an identified standardization issue in Section 10.

3. Balancing Capital and Specialized Weapons

Capital and specialist weapons should be balanced as complete ship systems, not only by changing damage. Torpedoes, railguns, battlecannons, heavy battlecannons, and large laser weapons should be powerful but require major design commitment.

Balance Factor	Purpose
Signature	Powerful weapons make the firing ship easier to detect or track.
Rate of fire	Larger weapons use slower firing cycles and longer reloads.
Shell velocity	Lower velocity gives targets time to dodge at long range.
Dispersion	Ordinary weapons become less reliable outside their optimal range.
Tracking speed	Heavy turrets cannot easily follow small or fast targets.
Required support blocks	Loaders, capacitors, cooling, ammunition feeds, and fire control consume internal volume.
Internal risk	Support systems create vulnerable compartments and failure points.
Power demand	Railguns, lasers, and advanced weapons strain the grid.
Heat generation	Energy weapons and rapid-fire systems require cooling or downtime.

The intended question is not simply "How many guns can I fit?" but "Can my ship support this weapon safely and effectively?"

4. Specialized Weapons Require Infrastructure

4.1 Support Blocks

Support Block	Used By	Function	Risk
Autoloader Block	Battlecannons, artillery, heavy turrets	Feeds large shells into the weapon.	Explosive if destroyed.
Capacitor Bank	Railguns and laser cannons	Stores energy before firing.	Can discharge violently or produce EMP-like effects.
Cooling System	Lasers, railguns, high-rate weapons	Controls heat buildup.	Weapon overheats or shuts down if damaged.
Ammunition Feed Block	Cannon and missile systems	Moves ammunition to the weapon.	Can detonate or disable reloads.
Targeting / Fire-Control Block	Precision weapons	Improves accuracy and tracking.	Weapon loses precision if destroyed.

These systems make large weapons affect the interior of a ship. A small hull may mount a large weapon, but without sufficient support it becomes vulnerable, inefficient, or dangerous.

4.2 Autoloaders as a Balance Mechanic

Weapon	Autoloader Requirement
Repeating Cannon Turret	Required or strongly recommended.
Artillery Turret	Required.
Battlecannon Turret	Required.
Heavy Battlecannon Turret	Required.
Heavy Torpedo Launcher	Required or integrated.
Large Railgun	No shell autoloader; capacitor support may be required.

1. Capital weapons consume internal volume instead of existing only on the outer hull.
2. The loader and magazine become vulnerable; damage can disable the weapon or cause an explosion.
3. Armor must protect the loader, ammunition path, and turret base.
4. Boarders can disable a weapon by attacking its loader room.
5. Ship class gains meaning: a corvette may support one large system, while a battleship can support several.

4.3 Capacitors, Cooling, and Failure Effects

Weapon	Required System	Primary Risk
Large Railgun	Capacitor bank	Detonation or EMP-like discharge if destroyed.
Railgun Turret	Capacitor bank	Localized power surge or EMP effect.
Large Laser Cannon	Capacitor bank plus cooling	Heat overload or power discharge.
Laser Defense Turret	Smaller capacitor / power buffer	Temporary shutdown if overloaded.

Capacitor Failure	Gameplay Result
Local EMP pulse	Nearby blocks shut down briefly.
Grid power disruption	Ship systems flicker or go offline temporarily.
Weapon lockout	Railguns or lasers lose their stored charge.
Heat spike	Nearby systems take damage.
Battery damage	The wider power system becomes vulnerable.

5. Range Model: Optimal Range, Not Only Hard Limits

Close-range combat does not require artificially tiny maximum ranges. Weapons can travel farther while becoming less reliable beyond their optimal envelope. This preserves long-range engagement without making every fight instant hitscan sniping.

Mechanic	Effect
Low projectile velocity	Maneuvering targets have time to dodge at long range.
Dispersion	Rounds spread over distance.
Tracking limits	Turrets struggle to follow fast targets.
Lock quality	Guided weapons become less reliable against low-signature targets.
Signature bloom	Firing large weapons makes the attacker easier to detect.
Sensor accuracy	Long-range shots depend on detection quality and firing solution.

Range Type	Meaning
Optimal range	The distance at which a weapon is expected to hit reliably.
Maximum range	The farthest its projectile can travel or remain dangerous.

Weapon Type	Optimal Behavior
Gatling CIWS	Short range; highly accurate against missiles and drones.
Autocannon	Medium-range accurate fire against fighters and light armor.
Flak	Medium-range airburst area defense.
Assault Cannon	Close-to-medium heavy fire with noticeable dispersion.

Weapon Type	Optimal Behavior
Repeating Cannon	Medium-range HE suppression; unreliable at long range.
Rocket Turret	Short-to-medium saturation; poor long-range accuracy.
Artillery	Long-range accurate AP fire with a slow cycle.
Battlecannon	Long-range heavy precision fire with an extremely slow cycle.
Railgun	Long-range precision kinetic fire.
Large Laser Cannon	Long-range precision line-of-sight energy fire.

The key question becomes "Can I reliably hit this target from here?" rather than only "Is it inside the maximum range?" A repeating cannon may technically shoot far, but low velocity and spread should allow a maneuvering target outside optimal range to avoid much of the fire.

6. Specialized Long-Range Exceptions

Most weapons should lose reliability at long range, but dedicated precision and capital weapons should break that general rule. Their accuracy should be balanced through cost, size, power, heat, support systems, reload time, signature, line of sight, interceptability, and tracking limits rather than random spread.

Specialized Weapon	Remain Accurate?	Main Balancing Method
Railgun	Yes	Power, capacitors, reload time, heat, and signature.
Railgun Turret	Yes	Lower output than a fixed railgun, capacitor demand, and tracking limits.
Large Laser Cannon	Yes	Power, heat, atmospheric or dust penalties, and line of sight.
Battlecannon Turret	Yes	Slow reload, large size, autoloader risk, and very slow tracking.
Heavy Battlecannon Turret	Yes	Huge size, extremely slow reload, massive signature, and internal risk.
Heavy Torpedo Launcher	Yes after launch	Expensive, detectable, interceptable, and dependent on a reload system.

A heavy battlecannon should miss because the target maneuvered, the turret could not track, the firing solution was poor, or the weapon was used badly - not because arbitrary random spread made a precision capital weapon inaccurate.

7. Signature, Targeting, and Tracking

7.1 Weapon Signature as a Tactical Cost

Action	Signature Effect
Charging railgun capacitors	Electrical and thermal spike.
Charging a laser cannon	Power and heat spike.
Firing a battlecannon	Thermal, recoil, and muzzle signature.
Launching a torpedo	Launch plume and guidance emissions.
Sustained Gatling fire	Heat and muzzle signature.
Missile lock	Radar or targeting emission.
Active radar guidance	Increased detectability.

This links weapons to radar, stealth, and scanning. A ship may coast cold and remain difficult to detect, but charging a railgun or launching a missile can reveal it. Players must decide whether to stay hidden or fire, charge early or late, and use passive detection or active targeting.

7.2 Tracking Speed as a Counterbalance

Weapon	Tracking Speed
Gatling CIWS Turret	Very fast
Autocannon Turret	Fast
Flak Turret	Medium-fast

Weapon	Tracking Speed
Assault Cannon Turret	Medium
Rocket Turret	Medium
Repeating Cannon Turret	Medium-slow
Artillery Turret	Slow
Railgun Turret	Slow-medium
Battlecannon Turret	Very slow
Heavy Battlecannon Turret	Extremely slow

This prevents capital weapons from replacing point defense and medium turrets. Battlecannons can dominate large targets but should struggle against fighters, drones, and fast incoming munitions, preserving a reason for layered defenses and small craft.

8. Ammunition, Internal Damage, and Dynamic Consequences

Large ammunition and energy-storage systems should create internal risk. Penetration should matter because a hit in the wrong compartment may disable a weapon, detonate ammunition, disrupt power, create heat damage, or open the ship to boarding.

Internal System	Risk if Damaged
70 mm rocket storage	Explosion, fire, or chain detonation.
105 mm HE autoloader	Major internal explosion.
120 mm AP magazine	Lower explosive risk, but artillery is disabled if damaged.
200 mm battlecannon autoloader	Severe magazine explosion.
350 mm heavy battlecannon loader	Catastrophic internal explosion.
Railgun capacitor	EMP-like discharge or power shutdown.
Laser capacitor / cooling system	Heat spike or power failure.
Torpedo storage	Catastrophic detonation.
Chaff launcher	Low physical risk; loss of defensive utility.

9. Why This Matters

These systems are not complexity for its own sake; they make combat more intelligent and ship design more meaningful. Capital weapons create design burdens: railguns need capacitors, power, and protection; battlecannons need autoloaders and magazines; torpedoes should be detectable, interceptable, expensive, and dangerous to store; and laser cannons require power, cooling, and clear line of sight.

Before mounting a weapon, players should ask: Can I power, feed, cool, and protect it? Can the ship survive damage to its support systems? Can it track the targets I expect to fight? Does firing reveal my ship? Is its tactical value worth the internal volume and risk?

The best combat system is not decided only by who has the largest gun. It is decided by who engineered the better ship.

9.1 Core Weapon Design Logic

The weapon list should create decisions rather than merely add blocks. The correct question is not "Which weapon has the highest DPS?" but "What problem am I trying to solve?"

Problem	Preferred Solutions
Missiles and torpedoes	Gatling CIWS, Laser Defense, or chaff.
Drones and fast light craft	Gatling CIWS, Autocannon, or Flak.
Exterior systems	Repeating Cannon, Autocannon, or Laser Cannon.
Heavy armor	Artillery, Railguns, or Battlecannons.
Capital ships	Heavy Torpedoes, Railguns, Battlecannons, or Heavy Battlecannons.
Boarding threats	Interior Turrets, corridor design, doors, and security layout.

Each weapon should encourage a different kind of ship, a different kind of fight, and a different engineering solution.