HEI SYSTEMS CONCEPT SERIES

A COMBAT SYSTEM PROPOSAL TURRET CONTROLLER

Ticket-based weapon coordination, scalable power demand, and configurable fire-control architecture

A centralized but scalable control system that turns automated weapons into part of a ship's internal infrastructure rather than isolated, self-contained blocks.

DOCUMENT TYPE	Combat systems concept proposal
PRIMARY SYSTEM	Automated turret coordination and fire control
DESIGN PRIORITY	Meaningful ship infrastructure, specialization, and redundancy

EXECUTIVE SUMMARY

Automated weapons in Space Engineers are currently capable of operating as largely independent blocks. That makes them simple to use, but it also removes much of the internal infrastructure, coordination, and damage vulnerability that should distinguish a lightly armed utility ship from a purpose-built warship.

The proposed Turret Controller addresses this by introducing a dedicated fire-control block that manages groups of automated weapons through a ticket-based capacity system. Each controller provides a fixed number of control tickets. Assigned weapons consume those tickets while active, and the controller's power draw scales with the amount of control capacity in use. Weapons still retain their own individual power requirements, so a heavily armed ship must support both the weapons themselves and the command infrastructure needed to operate them.

The system is intended to limit automation through infrastructure rather than through arbitrary hard caps. Players would remain free to build heavily armed ships, but doing so would require additional controllers, greater electrical generation, more cooling, protected internal space, sensor support, and redundancy.

1. SYSTEM PURPOSE

The Turret Controller would serve as the central coordination point for automated weapons assigned to it. Instead of every turret independently handling detection, target selection, tracking, and engagement, the controller would distribute fire-control capacity across a selected group of weapons.

This creates a clear distinction between mounting a weapon and being able to operate a complete weapon network. A ship with only a few defensive turrets could rely on a single controller. A larger combat vessel could divide its weapons across several protected controllers, each responsible for a different arc, target class, or combat role.

The proposal is not intended to prevent players from using large numbers of weapons. Its purpose is to ensure that weapon quantity is supported by proportional investments in power, control capacity, sensors, cooling, and survivability.

2. TICKET-BASED CONTROL CAPACITY

Every Turret Controller would provide a limited pool of control tickets. Each automated weapon would have a ticket cost based on its size, tracking complexity, firing role, and processing requirements. A weapon assigned to a controller would reserve or consume its required tickets whenever it is actively available for automated operation.

A 2.5-meter Turret Controller, for example, could provide 100 tickets. If a Gatling turret requires 25 tickets, that controller could operate up to four Gatling turrets at full capacity. The same controller might operate a larger number of simpler interior-defense weapons or only one or two advanced heavy turrets.

Example Loadout	Tickets Used	Capacity Used	Controller Power
1 Gatling turret	25	25%	Up to 10 MW
2 Gatling turrets	50	50%	Up to 20 MW
3 Gatling turrets	75	75%	Up to 30 MW
4 Gatling turrets	100	100%	Up to 40 MW

Illustrative values only. Final ticket and power costs would be determined by weapon class and controller size.

Ticket costs provide a common scale for comparing weapons without forcing every weapon to consume the same amount of physical space or electrical power. A small rapid-tracking turret may require significant control capacity despite having a modest weapon power draw, while a slow heavy cannon may require fewer tracking updates but more advanced ballistic calculation and coordination.

3. SCALABLE POWER DEMAND

The controller's electrical demand would scale with the number of tickets actively in use. A controller rated for 100 tickets and 40 MW would approach its maximum draw only when all 100 tickets are committed. A controller operating at half capacity would consume approximately half of its maximum control power, subject to a small idle requirement.

This power is separate from the electrical demand of the weapons themselves. A Gatling turret, laser turret, railgun turret, or other weapon would continue to draw power according to its own design. The Turret Controller represents the additional processing, tracking, communication, stabilization, and coordination required to operate the weapon automatically.

The result is a layered power requirement: first, the ship must power the weapons; second, it must power the control network that allows those weapons to function as a coordinated automated system.

4. MANUAL WEAPON ASSIGNMENT AND GROUPING

Players should be able to manually select which weapons are assigned to each controller. This is essential because different sections of the same ship may require different behavior, target priorities, and engagement limits.

A ship could assign its port and starboard point-defense batteries to separate controllers, dedicate another controller to forward offensive turrets, and reserve a fourth for long-range or manually directed weapons. The same weapon type could also be divided between controllers when different settings are needed.

Manual assignment would prevent every automated weapon on a grid from inheriting one universal configuration. It would also allow players to build compartmentalized and redundant fire-control networks instead of depending on a single controller for the entire ship.

5. FIRE-CONTROL SETTINGS AND CONTROLLER ATTRIBUTES

Each Turret Controller would provide settings that apply to the weapons assigned to it. These settings would define how the group detects, prioritizes, and engages targets. The controller therefore becomes more than a capacity limiter; it becomes the interface through which players establish the combat role of a weapon group.

Possible group settings could include:

- Maximum and minimum engagement range.
- Target priorities for missiles, characters, small grids, large grids, or specific subsystems.
- Projectile and missile interception behavior.
- Ammunition conservation and burst-fire limits.
- Coordinated fire, independent fire, or distributed target selection.
- Overkill prevention and target handoff behavior.
- Automatic, assisted, or fully manual operation.

Controllers could also support selectable operating attributes. A precision-tracking mode might improve accuracy at the cost of additional power or ticket usage. A rapid-response mode could improve target acquisition and switching speed while reducing effective range. A distributed-defense mode could spread fire across several incoming threats, while a coordinated-fire mode could concentrate multiple weapons against one target or subsystem.

These attributes would allow identical weapons to perform differently depending on the controller and configuration supporting them, reinforcing the wider combat-system goal of giving ship design and internal systems a direct effect on battlefield behavior.

6. DAMAGE, REDUNDANCY, AND FALLBACK OPERATION

Because the Turret Controller is a physical block, it becomes a meaningful internal system that can be protected, damaged, disabled, or destroyed. This creates a new layer of combat damage without requiring every weapon to be individually destroyed before a ship's defensive network is degraded.

If a controller is lost, its assigned weapons could lose coordinated automated targeting. Depending on the final implementation, they might fall back to limited local targeting, remain available for direct manual control, or transfer to another controller with sufficient unused tickets.

Smaller ships may accept the vulnerability of one centralized controller to save mass and power. Larger warships would have reasons to install several controllers in separate armored compartments, preserving partial weapon coverage after internal damage.

7. INTEGRATION WITH THE WIDER COMBAT SYSTEM

The Turret Controller should interact directly with the broader armor, weapon, heat, radar, sensor, and signature systems. Its effectiveness should depend not only on ticket capacity but also on the quality of the information and infrastructure available to it.

A controller connected to advanced radar and tracking systems could coordinate weapons at greater ranges and with better target prediction. A controller operating with damaged sensors might be restricted to local weapon detection or visually confirmed targets. Electronic warfare, jamming, communication disruption, or loss of targeting data could reduce accuracy and coordination without physically destroying the turrets.

The controller itself could generate heat and electronic signature according to its active ticket usage. A ship operating a large automated weapon network would therefore become easier to detect and would need sufficient cooling to sustain that network. Low-signature operation could reduce controller output and detection range in exchange for lower emissions.

8. SHIP DESIGN AND BALANCE OUTCOMES

The primary balance advantage of this system is that it replaces an arbitrary weapon-count limit with engineering requirements. Players may still build ships carrying large numbers of automated weapons, but those ships must provide enough controller capacity, power generation, cooling, sensors, internal volume, and protection to support them.

The ticket system also provides a clear method for separating weapon classes. Small defensive weapons can be controlled efficiently in groups, while advanced or heavy weapons require a larger share of a controller's capacity. Larger controller blocks can support greater weapon networks but create more significant power, heat, space, and survivability considerations.

Most importantly, the system allows ships using the same weapons to behave differently. One vessel may configure its turrets for missile interception and distributed defense, while another may use the same weapons for concentrated anti-ship fire. The distinction comes from the fire-control architecture and supporting systems rather than from weapon statistics alone.

CONCLUSION

The Turret Controller turns automated weapons into part of a ship-wide combat network. By linking control capacity, electrical demand, targeting behavior, sensors, heat, signature, and redundancy, the system adds meaningful engineering decisions without removing player freedom. A heavily armed vessel remains possible, but its firepower must be supported by the internal systems required to control and sustain it.