# Ship Upgrade Mechanics

There are 5 main upgradable stats for every ship: Shields, Armor, Hull, Engine, and Weapon. Each of these variables can be upgraded 10 times per ship, with each consecutive upgrade costing more than the last. The cost of these upgrades will scale exponentially along with the difficulty and scrap value of more advanced enemy ships.

$x(t)=x_0*(1+r)^t$

Costs will increase by a value of: $x(t)=50*(1+10)^{10}$

x(t) will be rounded to the nearest whole ten.

Cost/Level	50	130	340	870	2260	5870	15220	39490	102420	265650
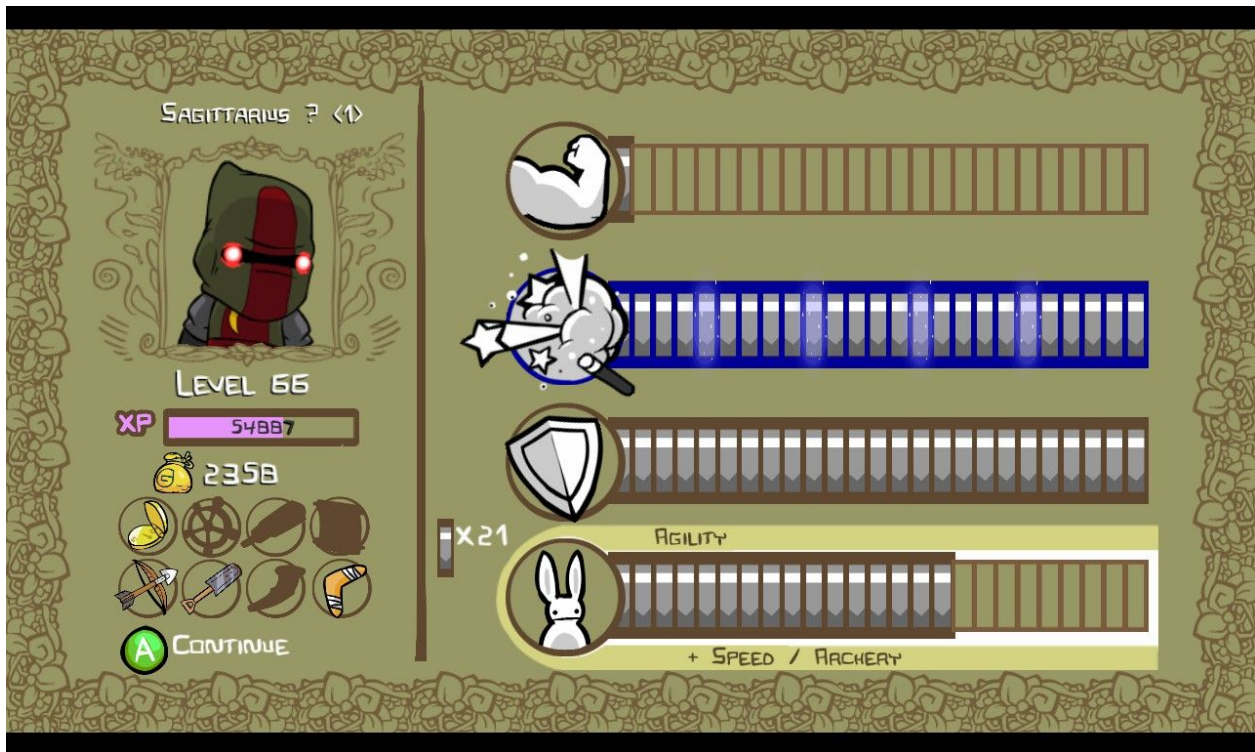
The menu will be similar to this in design. Each stat variable will have one of these bars, with each level filling a peg on the bar. A 3D image of your current ship will be where the image of the character is in this example.

Shields: Upgrading a ship's shield will increase a ship's max shields and shield recharge time.

Armor: Upgrading a ship's armor will increase the maximum armor of your ship, but not its the effectiveness or durability. The armor will increase by 100% of its current max value every level.

Hull: Upgrading a ship's hull will increase their maximum health and the effectiveness of health pickups. The maximum hull will increase by 100% of its current max value per level.

Primary Weapon: Upgrading a ship's primary weapon can increase a weapon's damage, fire rate, and bullet speed, as well as the weapon's visual style. The weapon damage increases by 100% of its current value per level.

Thrusters: Upgrading the ship's thrusters will increase the ship's speed and the recharge time of boosts. At certain levels, the number of boosts the ship can do at once will increase by 1. The thrusters will increase incrementally until the ship is 4 times faster at max level than it was at the base level.

Each ship will have 3 visual levels (new ship models). Each new visual will unlock when the ships unlock a certain amount of overall levels. (Amount of levels to be determined.) Each level will increase a ship's stats by a certain fixed amount.

Each value listed below is an Unreal Engine value/input. Each color corresponds to one attribute that the player can upgrade.

Spectre:

Level	1	2	3	4	5	6	7	8	9	10
HP	50	100	200	400	800	1600	3200	6400	12800	25600
Shield	50	100	200	400	800	1600	3200	6400	12800	25600
Armor	25	50	100	200	400	800	1600	3200	6400	12800
Thruster	780	1014	1248	1560	1794	2028	2340	2574	2808	3120
Wep.DMG	25	50	100	200	400	800	1600	3200	6400	12800
Wep.Delay	.3s	.3s	.3s	.3s	.3s	.3s	.3s	.2s	.2s	.2s

Excelsior:

Level	1	2	3	4	5	6	7	8	9	10
HP	100	200	400	800	1600	3200	6400	12800	25600	51200
Shield	100	200	400	800	1600	3200	6400	12800	25600	51200
Armor	100	200	400	800	1600	3200	6400	12800	25600	51200
Thruster	600	780	960	1200	1380	1560	1800	1980	2160	2400
Wep.DMG	20	40	80	160	320	640	1280	2560	5120	10240
Wep.Delay	.2s	.2s	.2s	.2s	.2s	.2s	.2s	.2s	.2s	.2

Juggernaut:

Level	1	2	3	4	5	6	7	8	9	10
HP	200	400	800	1600	3200	6400	12800	25600	51200	102400
Shield	25	50	100	200	400	800	1600	3200	6400	12800
Armor	200	400	800	1600	3200	6400	12800	25600	51200	102400
Thruster	300	390	480	600	690	780	900	990	1080	1200
Wep.DMG	100	200	400	800	1600	3200	6400	12800	25600	51200
Wep.Delay	1s	1s	1s	1s	1s	1s	1s	1s	1s	1s

Reaper:

Level	1	2	3	4	5	6	7	8	9	10
HP	75	150	300	600	1200	2400	4800	9600	19200	38400

	1	2	3	4	5	6	7	8	9	10
Shield	150	300	600	1200	2400	4800	9600	19200	38400	76800
Armor	50	100	200	400	800	1600	3200	6400	12800	25600
Thruster	720	936	1152	1440	1656	1872	2160	2376	2592	2880
Wep.DMG	.05	.1	.2	.4	.8	1.6	3.2	6.4	12.8	25.6
Wep.Delay	.5s	.5s	.5s	.5s	.5s	.5s	.5s	.5s	.5s	.5s

Dragonfly:

Level	1	2	3	4	5	6	7	8	9	10
HP	100	200	400	800	1600	3200	6400	12800	25600	51200
Shield	75	150	300	600	1200	2400	4800	9600	19200	38400
Armor	50	100	200	400	800	1600	3200	6400	12800	25600
Thruster	900	1170	1440	1800	2070	2340	2700	2970	3240	3600
Wep.DMG	5	10	20	40	80	160	320	640	1280	2560
Wep.Delay	.1s	.1s	.1s	.1s	.1s	.1s	.1s	.1s	.1s	.1s

Corsair:

Level	1	2	3	4	5	6	7	8	9	10
HP	150	300	600	1200	2400	4800	9600	19200	38400	76800
Shield	125	250	500	1000	2000	4000	8000	16000	32000	64000
Armor	100	200	400	800	1600	3200	6400	12800	25600	51200
Thruster	480	624	768	960	1104	1248	1440	1584	1728	1920
Wep.DMG	50	130	340	870	2260	5870	15220	39490	102420	265650
Wep.Delay	.6s	.6s	.6s	.6s	.6s	.6s	.6s	.6s	.6s	.6s

Crusader:

Level	1	2	3	4	5	6	7	8	9	10
HP	125	250	500	1000	2000	4000	8000	16000	32000	64000
Shield	75	150	300	600	1200	2400	4800	9600	19200	38400
Armor	150	300	600	1200	2400	4800	9600	19200	38400	76800
Thruster	420	546	672	840	966	1092	1260	1386	1512	1680
Wep.DMG	30	60	120	240	480	960	1920	3840	7680	15360
Wep.Delay	.5s	.5s	.5s	.5s	.5s	.5s	.4s	.4s	.4s	.4s

Nebula:

Level	1	2	3	4	5	6	7	8	9	10
HP	150	300	600	1200	2400	4800	9600	19200	38400	76800
Shield	50	100	200	400	800	1600	3200	6400	12800	25600
Armor	125	250	500	1000	2000	4000	8000	16000	32000	64000
Thruster	360	468	576	720	828	936	1080	1188	1296	1440
Wep.DMG	90	180	360	720	1440	2880	5760	11520	23040	46080
Wep.Delay	.9s	.9s	.9s	.9s	.9s	.9s	.9s	.9s	.9s	.9s

Hunter:

Level	1	2	3	4	5	6	7	8	9	10
HP	150	300	600	1200	2400	4800	9600	19200	38400	76800

Shield	50	100	200	400	800	1600	3200	6400	12800	25600
Armor	75	150	300	600	1200	2400	4800	9600	19200	38400
Thruster	660	858	1056	1320	1518	1716	1980	2178	2376	2640
Wep.DMG	50	100	200	400	800	1600	3200	6400	12800	25600
Wep.Delay	.7s	.7s	.7s	.7s	.7s	.7s	.7s	.65s	.65s	.65s

Voidwalker:

Level	1	2	3	4	5	6	7	8	9	10
HP	100	200	400	800	1600	3200	6400	12800	25600	51200
Shield	200	400	800	1600	3200	6400	12800	25600	51200	102400
Armor	50	100	200	400	800	1600	3200	6400	12800	25600
Thruster	600	780	960	1200	1380	1560	1800	1980	2160	2400
Wep.DMG	40	80	160	320	640	1280	2560	5120	10240	20480
Wep.Delay	.4s	.4s	.4s	.4s	.4s	.3s	.3s	.3s	.3s	.3s