

Conceptualization (Pre-Design)

What do you want your design to -be- ?

Without committing to specifics, what is your end goal with your design? Do you want to create a fast-and-lethal Type? A mass-produced frontline think-tank? An urban AJAX meant for paramilitary police forces? Whatever the case, the better defined your concept for the design is, the easier it will be to navigate the rest of the process. To a degree, knowing what you want also tells you what you don't want (and vice versa). If you know from the beginning that you are only interested in building a think-tank then you won't have to spend any time later worrying about what kind of arm parts to mount on it - it won't need them in the first place.

For some, this stage is easier than others. While there is really no wrong way to arrive at the concept for your design, for those who struggle we offer the following considerations that help inform our own designs:

Role

Having a general idea of what role your design intends to fill is the single greatest navigator for the design process. The classical roles **Offense**, **Defense**, and **Support**. Each role should be self-evident to a degree, but keep in mind that these are used as high-level concepts, not strict categories that a design must adhere to. **Offensive** roles are usually designed to focus on damage and doing as much of it as possible, as quickly as possible. Likely they'll spend a larger portion of their CP on weaponry and will need to consider all possible targets they may face. On the other hand, specializing against only certain targets or in certain situations can help keep cost and complexity from ballooning out of control. **Defensive** roles exist on the other end of the spectrum - their main focus is being able to survive as much punishment as possible. How to redirect fire towards yourself is also an important consideration (you can't capitalize on your endurance if the enemy can simply ignore you). **Support** roles are best understood as two shared principles: the ability to hinder the enemy and the ability to aid your allies. These designs achieve success through extensive system and sensor options that allow them to observe the battlefield and coordinate allied actions.

Again, roles should not be treated as exclusive. If anything, they are better informed by their peers. Support roles mixing the principles of offensive designs can use their expanded situational awareness in order to provide long-range indirect fire while a Defensive design may utilize support systems in order to draw attention away from their allies.

Theme

A design theme provides grounding in the setting. Do you want to design an Irregular Type or something hailing from a certain generation, manufacturer, or military? Do you want to create a futuristic, high-speed type focusing on flashy thermal laser weapons and agility, or do you want a rugged and pragmatic unit armed with tried-and-true ballistic armaments? Theme focuses more on how your design looks than how it operates mechanically, making it much easier to

conceptualize. In many cases it helps to imagine a “snapshot” of your final design as an ideal. For others, combining disparate elements from other places can instead help them clarify their own concept.

Gimmick

A gimmick is similar to a theme, but is instead entirely about the mechanical performance of a design. Here you are focusing on a particular mechanic that you want to explore. This is easiest to understand with classic concepts like the sniper or the brawler. Both of these are gimmicks in that they focus entirely on one method of fighting. Even if they utilize back up or alternative weapons, their main design is focused around their preferred combat style. Gimmicks can be more or less specific than these examples as well. You may decide that you want to focus your design on only one kind of mechanic, such as Overheat, or around broader concepts like being EN-independent.

A gimmick may also yield a theme, and a theme can yield a gimmick. The distinction we are using here is that one is grounded in appearance and the other in performance.

Outside Inspiration

Looking outside of the material presented in this game can also be a wellspring of inspiration. You may wish to pull in a design from elsewhere and attempt to recreate it using the technical systems rules, or you may instead try to rehash it with a mix of the original elements and your own additions. It is important to still try and ground your design in the game that you will be playing - if a certain element, technology, or population doesn't exist then you should consider it an opportunity to adapt, rather than an exception for the outside concepts existence.

Random

When all else fails, simply leave parts of your design up to chance. It may seem counterintuitive, but sometimes an element of the unexpected is the perfect foil for creative design. There are a myriad of such materials in existence already - traditional tables and charts, even AI assisted generators. The below is our own addition to the body of random tables:

- Take three existing designs and separate them each into core and head, upper limbs, and lower limbs. Create a new design using the upper limbs from one source, the lower limbs from a second source, and the core and head from a third source.
- Place the head of your design underneath the core, rather than on top of it.
- Place your main weapon system in the Core and avoid mounting any additional weapons in the limbs.
- Take a conventional vehicle or think-tank and transform it into a Type, or do the opposite and adapt a Type into a think-tank.
- Keeping in mind part size requirements, make your design increase or decrease in proportion from top to bottom. Either have the lower limbs be the largest parts and decrease in size as you go up, or make the head the largest part and decrease as you move down.
- Make the design more (or less) symmetrical.

- Make all of your structure parts the same class save one, which is either much larger or much smaller than the others
- No hand held weapons and no mounts in the arms - all weapons must be mounted elsewhere in the design.
- Take a design that you dislike and re-imagine it with all the upgrades it would need to be successful.
- Take a design that you like and strip it down to its bare essentials - use only what is absolutely necessary. Embrace it as a production downgrade.
- Draw from a different genre for your design - find inspiration in fantasy, science fiction, alternative history, etc.
- Try to design a personification of an abstract concept. Emotions like regret or metaphors like the passage of time are good starting places.
- If you're working with a group, swap designs with another player (they work on your design and you work on their design).
- Emphasize differences
- If you're working with a group, do a design by committee. Major decisions are put to a vote if there is disagreement, and each person gets one blanket veto (whatever they veto must be excluded regardless of other votes) OR one blanket include (whatever is included must be in the design regardless of other votes).

Design

As the name indicates, this stage transitions your concept into more specific elements. In that sense, this step still only represents drafting your design on paper - your character is not committing any materials or resources to any kind of production yet (beyond their time and energy, of course). In this previous step you decided you may want this or that role, or weapon, or feature. Here you will decide specifically what that thermal weapon actually does - it's damage, range, how much it will cost and any drawbacks it may have, so on.

To facilitate this, we provide the following collection of rules that can be used to mechanically define a very, very wide range of concepts. We refer to these rules as the Technical System. The Technical System is largely open-ended: the rules do not, themselves, suggest that you may only spend so much time or money on a given design, or that you cannot build some truly powerful combination of weapons and systems if you so wish. In that regard, the limiting factor should come from your own discretion, as well as that of your group. If you want to go all-out and build the strongest thing you can conceive of, then by all means go absolutely wild. But often a group may decide to limit themselves in a myriad of ways in order to suit their particular game - most often this will be done by restricting budgets, although in some cases certain systems or weapons may also be excluded.

The following terminology is used extensively throughout the Technical System:

Part(s): A part is a singular component of an overall design and is the smallest measure of a component in the Technical System i.e. a (one) part. A design's skeleton is made up of structural parts - leg parts, core parts, pod parts, etc. Other kinds of parts are placed inside of the skeleton

- generator parts, weapon parts, booster parts, etc. The distinction between parts is important to understand within the Technical System, but not outside of it (meaning that it is necessary to understand that fuel is a “part” in the design, but you don’t ask for “fuel parts” when filling up your Type at the hangar).

Space(s): Space is the primary limiting factor when designing using the Technical Systems. Structural parts provide available space and almost everything else in the design takes up some of that space. Because there are very few (if any) restrictions on where or how many parts can be installed in the structure, space is the only real hard limit - at the end of the process, you must be able to fit all of your new designs into the structure.

Generally speaking, a part takes up spaces equal to its final CP cost. There are exceptions to this - many systems do not take up space (either they are assumed to be already integrated with the structure, or the amount of space they would take is negligible) and still others list their space and CP separately.

In some cases CP modifiers (especially multipliers) can create fractions of space. In these situations, work out all modifiers and then round the final value up. In this way, it should not be possible to have a part that takes up only a fraction of space (or less than 1, or even zero spaces - every part would have to take up at least 1 space using this rule).

External carrying capacity is also determined by the space of the underlying structural part. Hands can hold space equal to the *unmodified* space of the arm part they are attached to (meaning that sacrificing kills in the structure to create space does not increase a hand's carrying capacity). Further, two (or more) hands carrying something add their carrying capacity together.

Spaces can be further manipulated using space efficiency and structural reinforcement, both of which are described elsewhere.

Kill(s): Like spaces, Kills simultaneously refer to two related concepts - a part's ability to be damaged, and a measure of damage itself. A part's Kills is usually equal to the space it takes up (again, there is an exception when the part lists a separate value). For parts that do not take up space, or for those that do not have a Kills value listed, it is assumed that they function as long as the structure that they are placed in remains intact; they cannot be damaged separate of the structural part and therefore only the structural parts remaining Kills need be tracked.

As a rule 1 Kill is equal to 25 Hits. This is a calculation used to determine the threshold at which hits start to deal kills. However, keep in mind that any amount of Kills (even 1) is enough to outright kill a human target, even if they would somehow have more than 25 hits worth of health. Some weapons, particularly human scale anti-vehicle weapons and Type scale anti-personnel weapons deal hits to hits and kills to kills. Values presented in the Technical System are always Kills unless stated otherwise (it is assumed that you are using the Technical System to design vehicles and Types primarily, rather than human-scale equipment).

Construction Points: Often abbreviated CP, Construction Points indicate the cost of any given part. CP budget is the primary way of gauging the potential of a design - the more CP you

spend, the more effective the design will ultimately be. There is some leeway in this, as CP can be spent efficiently or not depending on what you want your design to do, but all else being equal a design with more CP is stronger than one with less. Because CP ultimately also acts as the proposed bill for your design it is still wise to act with a degree of restraint. 1 CP works out to \$20,000.

Weight: Weight at the Type scale is measured in tons (in this case, metric tons i.e 1000 kilograms or 2204 pounds). Weight of your design is calculated using Kills, with 1 Kill equaling 1 ton. Furthermore, there two weight measurements are relevant: The weight of the design not including fuel and ammunition is called the *dry mass*, the weight with ammunition, fuel, and other removable parts of the design is referred to as *loaded mass*.

Height: The height for designs can vary wildly. Types range from 6 to 12 meters high depending on the generation they come from and their specific design beyond that. Nerve-Tracers, think-tanks, and conventional vehicles come in all sorts of shapes and sizes beyond that, given that they are not bound to a humanoid shape (armor jackets are also not considered in the above, as they are in a different scale entirely). Because height is not an important factor in determining the capabilities of a design, it is ultimately left at the discretion of the designer (along with any other physical dimensions). That said, a rule of thumb for determining height is to multiply the Core parts Kills by .8, giving you a rough height from head to toe. If your design does not have legs, halve the final result (you can use the same equation to determine the longest or widest part of a conventional vehicle instead).

Additives and Multipliers: Most parts in the Technical System are additive, meaning that various parts used in conjunction simply add to the designs overall CP, weight, etc. There are also cost multipliers that work one of two ways. For weapons, cost multipliers apply to the CP cost of only the weapon itself (in this case also increasing the space requirements). For other parts, the cost multiplier applies to the final CP cost of the design (but do not generally increase the space of any other parts). The Technical System will clearly indicate when an option is a cost multiplier and which kind of multiplier it is.

The Technical System

Structure

A structure is essentially the skeleton of a design. It is the frame by which all other internal systems and armor are ultimately mounted, and is the primary factor when determining how much available space there is to do so. It also represents the designs total integrity - armor loss will not compromise the function of a component, but structure loss will.

Structural parts are organized by Class in ascending order, with each level offering more durability and space than the last, at the expense of increased weight and cost.

Core

A core is the central component of the structure from which all other components are normally mounted. It also usually houses the cockpit for piloted or crewed vehicles, as well as critical internal systems such as generators and fuel reserves. Core parts are large by necessity where space and durability are in high demand and they tend to serve as the foundation for the rest of the structure's design.

The exact nature and shape of a Core part is ambiguous, save that it is the central component of the structure. For Types and other kinds of humanoid Nerve Tracers the Core acts as a torso, whereas in Think-Tanks and lesser contemporary vehicles, the Core is the overall hull or body. When starting from scratch, the only thing that is important to remember is that the Core serves as the primary component of the structure, and that a unit only ever has one.

Class	Cost, Space, Kills	Pod Mounts
1	2	0
2	4	1
3	6	1
4	8	1
5	10	2
6	12	2
7	14	2
8	16	3
9	18	3
10	20	3
11	22	4

Legs

Legs are ambulatory structural part that allow some semblance of walking. However, more so than maneuvering, their primary purpose is to support the weight of the rest of the structure (and especially the Core). As a result, they do not offer as much space for additional systems.

Most Types are bipedal, though other varieties do exist (and are common among Nerve Tracers and Think-Tanks especially). **Reverse Knee-Joints**, as they are commonly called, are identical to a standard leg, save that the knee joint has been reversed. This serves to nominally improve

their ability to walk, leap, and run at the expense of stability. They are also referred to as **Reverse Joint**, **Reverse Knee**, or simply **Reverse Leg** joints. **Digitigrade** legs are another variant of reverse knee-joint legs. In this case the knee itself is unaltered while the lower leg, ankle, and foot are redesigned to mimic the motion common in predators (wolves, lions, etc.). These striking designs fulfill the same purpose as reverse joints, and have the same benefits and limitations.

The second major variety are **Quadrupeds**, where four legs are mounted to the core rather than two. While a significant increase in cost of the structure, the additional parts provide excellent stability and make ideal platforms for supporting heavy weapons. There is no positive impact in overall speed, and in fact the additional legs serve to slightly impair maneuverability and range of motion compared to their bipedal cousins. On the other hand, losing a leg is not as crippling for a quad Type as it would be otherwise. **Tripods** are a variant of Quadrupeds with only three legs. They sacrifice some of the stability of a quadruped to regain some of the maneuverability of a biped. Further variants with more than four legs do exist among Nerve Tracers and Think-Tanks, but the additional legs only serve to act as redundant backups and have no other noteworthy benefit. It is possible for Quadrupeds/Tripods to be built with reverse joints which alters their performance further, but it is not possible to mix reverse joints and bipedal ones (or, rather, it is possible, but has no effect on performance whatsoever - all legs would simply behave like bipedal ones).

Class	Cost, Space, Kills
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10	10
11	11



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Biped - Movement x3
Reverse Joint - Movement x4
Tripod - Movement x2.5?
Quad - Movement x2
Treads - Movements x3
Wheels - Movement x4

Head

This part primarily serves to house a unit's sensor systems, processing units, and onboard computers. As a result, they are usually small and nestled into protected areas of the Core that keep them away from incoming fire. However, some designs will mount tremendous Heads in order to fill them with advanced sensor suites, auxiliary systems, cockpit replacements/extensions, or even weaponry. In any case, "Head" is just common vernacular - it is not required that it is oriented at the top of the Core or has any resemblance to an actual head. Conventional vehicles may have their Head built into a turret housing or command dome.

Class	Cost, Kills	Space
1	1	1
2	2	2
3	3	2
4	4	3
5	5	3
6	6	4
7	7	4
8	8	5
9	9	5
10	10	6
11	11	6

Arms

Arm parts are normally a component of Types, but may also appear on advanced NTS or think-tanks. They facilitate a wide-range of motion and tasks; a Type's arms allow it to lift, drag, and throw objects, or engage in close combat. However, their most desirable trait is that they allow a Type to carry and operate weapons. Not only does this add supplemental firepower to the unit beyond whatever is integrated in the structure, it makes them especially flexible - able to discard spent weapons and retrieve new ones.

A Hand is integrated into an Arm at no additional cost. They can be left off, freeing 1 space but be aware that without a hand the Arm is incapable of holding, carrying, or manipulating objects. Otherwise, a Type can carry objects up to the space available in its arm. Carried items don't

take up space in the arm itself, but the total space of the arm still determines how much can be carried. Multiple arms carrying an object add their total space together.

Class	Cost, Space, Hull Points
1	2
2	3
3	4
4	5
5	6
6	7
7	8
8	9
9	10
10	11
11	12

Pods

Pods are a catch-all category of supplemental parts, usually added after the rest of the skeleton has been defined. They are almost entirely empty space meant to hold additional weapons, systems, ammunition, fuel, boosters, or auxiliary components. This is accomplished by removing all but the most rudimentary internals, which are largely unnecessary given the pod's purpose. Beyond that, their actual appearance varies and is only really informed by the systems that are installed within.

The main limitation is that a core can normally only mount so many external pods, determined by its class. This isn't a weight limitation so much as a matter of the surface space available. This also means that pods cannot be mounted to other parts of the structure separately - they must ultimately be tied back into the main body of the unit.

One final characteristic of Pods is that they are designed to be interchangeable (a result of their supplemental nature). Empty, damaged, or otherwise unwanted Pods can be purged with a Ready action. New pods still need to be mounted by an engineer, but take only a fraction of the time (one-tenth of the normal maintenance time needed to replace a structural part).

Class	Cost	Space, Kills
1	1	2
2	1.5	4
3	2	6
4	2.5	8
5	3	10
6	3.5	12
7	4	14
8	4.5	16
9	5	18
10	5.5	20
11	6	22

Wheels and Tracks

While wheels or tracks are uncommon in Types, they are a staple over every other class of conventional vehicle. Functionally they are similar to legs - they hold the weight of the unit and act as transport for the rest of the structure. However, their mechanism of doing so is different enough to warrant separating into their own category.

Like quad Types they have exceptional stability and are well-suited to mounting heavy weapons as a result. Like reverse joint bipeds they also have an increased ground speed. However, their ability to capitalize on these traits relies heavily on the terrain they are operating in. Tracked vehicles need flat, open terrain to make the most of their propulsion systems. Outside of that their effectiveness drops dramatically. They lack the ability to step around or over obstacles and struggle to quickly navigate any sharp changes in inclination.

This extreme disadvantage in terms of mobility means that these systems are rarely, if ever, used for Types. If they are, it is usually as a cost-saving measure; the mechanisms are old, well-understood, and very easy to incorporate compared to any sort of ambulatory system.

Wheeled Leg Parts have an additional bonus to speed, while **Tracked Leg Parts** have a slightly easier time navigating difficult terrain.

Class	Cost	Space, Kills
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1	1.5	2
2	3	4
3	4.5	6
4	6	8
5	7.5	10
6	9	12
7	10.5	14
8	12	16

Wings

Wing structure is limited exclusively to aircraft, be it think-tanks, tracers, or conventional varieties. A few Type designs incorporate wings or fins, but usually for ornamentation purposes or to serve as hard points for weapon systems. There also exist NEXT Type schematics that call for full-on flight systems, wings included, but none have ever been produced.

While wings themselves do not provide any sort of propulsion, they do facilitate maneuvering in the air. Types with wing parts enjoy sustained jump distances and improved mobility in the air. Other aircraft need wings to be capable of sustained flight in the first place (a jet without wings is essentially just a rocket).

Class	Cost, Space, Kills
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10	10

11	11
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Primary Systems

Primary systems are critical parts that are mated with a vehicle's frame. While the structure determines many characteristics of the final form and available space, the primary system parts are what provide life to the otherwise lifeless skeleton. Many of a Type's baseline parameters are established by its primary system, and the more robust the part, the greater the cost and bulk.

Generally, Primary Systems are compulsory - they can be cut to save space, weight, or cost, but they cannot be left off entirely without compromising the nature of the vehicle itself. That is to say: you can surely build a Type without a generator, but in that situation (unpowered, unable to move), it becomes essentially an oddly shaped bunker.

Power System - Generator, Radiator, and Fuel

Because the parameters of the generator, radiator, and fuel are interdependent, they are presented as a single part with shared dynamics. Collectively they make up a unit's Power System - providing energy for all other parts and systems.

Generators are simple: they consume fuel and output energy. They are rated by total max weight - meaning the dry mass of the unit that the power system can provide power for, including the weight of the power system itself (but not carried/held items). A generator also provides an amount of EN surplus; energy that is available beyond what is necessary to provide constant power to the unit. This surplus EN can in turn be used to power other parts like boosters, thermal weapons, auxiliary sensors, or it can be funneled back into the power system itself in order to increase overall efficiency, reduce fuel consumption rate, or provide constant power for new passive systems. Most often it is only necessary to install a generator that can handle the final loaded mass of the proposed design and move on. However, many designs call for larger than necessary parts in order to capitalize on surplus EN, or to indirectly save weight and space by cutting fuel loads. "Underweight" generators are also technically possible through the use of weight efficiency, although in this case it is done by simply reducing the final weight of the design so that the smaller part can handle it.

Max Dry Mass	10t	20t	30t	40t	50t
Base sEN	5	20	40	55	70
Space	1	2	3	4	5

Cost and Kills	2	4	6	8	10
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Max Dry Mass	60t	70t	80t	90t	100t
Base sEN	85	95	110	120	135
Space	6	7	8	9	10
Cost and Kills	12	14	16	18	20

Max Dry Mass	110t	120t	130t	140t	150t
Base sEN	150	160	175	185	200
Space	11	12	13	14	15
Cost and Kills	22	24	26	28	30

Max Dry Mass	160t	170t	180t	190t	200t
Base sEN	85	95	110	120	135
Space	16	17	18	19	20
Cost and Kills	32	34	36	38	40

Ostensibly, the **Radiators** sole purpose is to keep a unit from overheating. While this is true to a degree, it undersells the influence that this part has on overall performance. They are the primary determinant of how fast the generator can output energy to secondary systems. This is critical for Types who often have many parts all clamoring for available energy - boosters, energy weapons, sensors, etc. The faster you can get it, the more they can be used. Even the function of heat protection is important given that muscle wire, the most common hi-tech actuator in use, is dependent on consistent internal temperatures in order to function. That said, a radiator is not necessarily a required component. Generators without one are able to very slowly replenish surplus energy, and heat is not (as) dangerous to those units who do not utilize SMAs. Designs that do not rely on available energy, including regular vehicles, don't need the radiator in order to function, and so leave it off in order to save weight, space, and cost.

EN Refresh Rate: This is the amount of time it takes the generator to refresh its surplus EN.

Rate	1 hour	30 min	15 min	10 min	5 min	1 min
Cost	0	4	8	12	16	20

Heat Diffusion: The EN cost of the radiator to remove 1 heat.

Heat Diffusion	50	40	30	20	10
Cost	1	2	3	4	5

Fuel is a mixture of all the compounds necessary to feed the generator. Fuel takes up space and adds to the loaded mass, while the rate at which the generator consumes fuel determines how much is needed. The rate of consumption for a generator can be increased to increase energy output (surplus EN). Alternatively, energy output can be lowered in order to make the generator more efficient (reducing the space and weight needed for fuel). Finally, internal fuel stores are supplementary to the fuel already contained in the generator. That is to say: the generator itself can hold 1 ton of fuel (included in its listed weight and space). This means that even if the design allocates no space for additional fuel (internal or external) the generator itself is capable of running for however long it takes to consume that single ton of fuel, after which it ceases function and must be refueled.

Fuel Consumption: By default the generator consumes 1 ton of fuel for every 4 hours of operation. Additional fuel costs 1 CP and takes up 1 space per ton. Remember, even without additional storage, the generator itself holds 1 ton of fuel (factored into its weight and space requirements). The fuel consumption rate can be optimized towards fuel efficiency (lowering the rate at which the generator consumes fuel at the cost of energy output) or towards EN output (increasing the rate at which the generator consumes fuel in order to increase available sEN). There is no CP cost for this optimization - the benefits and drawbacks of either one cancel each other out.

FC Rate	1 min	5 min	15 min	30 min	1 hour
Output	+100%	+80%	+60%	+40%	+20%

4 hours	8 hours	12 hours	16 hours	20 hours	24 hours
Default	-20%	-40%	-60%	-80%	-100%

Actuators

Actuators are the mechanism by which a design is able to transfer energy from the power system into ambulation. They are to a machine what muscles are to an organism.

Types and other advanced NTS' utilize **Shape-Memory Alloys** or, as they are more commonly known, **Muscle Wire**. While their exact composition varies, the common trait of SMAs is that

they are able to actively change their shape when exposed to heat. This allows the creation of synthetic musculature and enables a Types wide range of motion. That said, when compared to other systems, the SMAs power-to-weight ratio is only average, and the material itself is vulnerable to extreme fluctuations in heat (which cause the muscle wire to prematurely activate and lock up, somewhat akin to a seizure in a human being).

Other varieties of actuator exist, mostly adopted from older technologies, and each has its own qualities that impact a design's parameters (although not always for the better). **Hydraulics** are a mainstay of heavy industry and have an unmatched power-to-weight ratio. The drawback is that they are bulky and slow to respond comparatively. They are primarily used in think-tanks and lesser conventional vehicles, although Type-compatible hydraulic kits exist for those who are drawn to the increased striking power.

Linear Motors are a stark contrast. These devices create linear force utilizing electrical current. They are virtually frictionless, they don't require lubricants (or even air) to function, and are easy to maintain once installed. More importantly their level of speed, control, and accuracy are unmatched. As a result their main implementation is in fields of medicine, aeronautics, space development, and other environments that call for precision engineering. They retain the same characteristics when scaled up for use in Types, but at the same time the technologies inherent flaws become more apparent. They have the lowest power-to-weight ratio of any actuator, and while maintenance is simple, the components themselves are bulky and difficult to integrate.

Mechanical actuators are less a specific technology and are more a catch-all category for the odd design that does not fit into the other categories. Generally they are comprised of simple machines that have been scaled up and powered for use in Types and the like. Chain drives, gear trains, camshafts, and linkages are collectively cobbled together in a rough facsimile of humanoid movement. In conventional designs, where they most prominently appear, they act as the main drive that propels the vehicle forward on wheels/treads/wings, etc. Compared to the other actuators available they are inefficient when scaled for Type use, and their power-to-weight ratio is lacking as well. If they have any benefit, it is that they are made up of well-understood and commonly available components, driving their cost down and reducing maintenance needs. Still, the only Types that may call for the use of mechanical actuators are irregulars, and even they only do so out of necessity.

	Base Core	Base Celerity	Core Increment	Core Cost	Celerity Increment	Celerity Cost
Shape-Memory Alloys	40/70	40/70	+05 / +05	1 CP / 2 CP, 1 Space	+05 / +05	1 CP / 2 CP, 1 Space
Hydraulics	60/70	30/50	+10 / +10	1 CP / 2 CP, 2 Space	+05 / +05	2 CP / 2 CP, 2 Space
Linear Motors	30/50	60/70	+05 / +05	2 CP / 2 CP, 2 Space	+10 / +10	1 CP / 2 CP, 2 Space
Mechanical	30/50	30/50	+10 / +10	1 CP / 1 CP, 1	+10 / +10	1 CP / 1 CP, 1

				Space		Space
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Base Core/Celerity: The starting Core and Celerity value of the actuators.

Increment: The rate at which the Core and Celerity attributes of the actuators can be developed.

Cost: The cost in CP and spaces for each increment of increase of development or scale of the actuators. For all actuators development costs only CP, while scale costs space and CP. For scale increase, the actuators take up space in all structural parts except for Pods.

Control Systems

Control Systems represent two important components: the cockpit, or other means by which the pilot/operator interacts with the unit, and the onboard computer that governs all other electronic systems. Where the pilot is the brain (usually), the control systems are the central nervous system. Often the cockpit and the bulk of the onboard computer are nestled safely away in the Core, while sensors are placed throughout the design (with the highest concentration in the head). These sensors create a basic information feed to the pilot and onboard computer and occupy negligible space throughout the structure. Control Systems are informally referred to as **CS Systems** (which is redundant in the same way as saying “ATM machine”). They are broadly classified based on the technology involved in the system, as well as their capabilities and the amount of attention they demand on the part of the operator.

The most rudimentary CS systems are **Manual**. Control in this system is facilitated by steering wheels, pulleys, levers, throttles, chokes, etc. Everything has to be done by the pilot themselves; there are no additional support systems in place. Instruments and readings will be organized as best as possible in the cab and there are view ports that allow the pilot a limited look outside. The onboard computer is capable of only the most basic functions like regulating fuel loads, air conditioning, speed, etc. The drawbacks to a Manual CS system are numerous and obvious. The pilots situational awareness is severely hindered and the burden of any targeting, navigation, maneuvering, all falls to them. Additionally, their reliance on visuals makes the cockpit more vulnerable than normal. Thus these systems are considered antiquated and outdated - even conventional civilian vehicles have been upgraded beyond this category. Still, they are incredibly cost-effective and can still be found on low-end industrial equipment, especially what is being fabricated on the fringes of civilization.

Integrated CS Systems, also called **NTS-Aided**, are the benchmark for most conventional vehicles and think-tanks. In these setups the onboard system has been upgraded to better analyze and classify incoming data and to take over routine tasks on behalf of the pilot. An Integrated system can anticipate terrain and speed changes, monitor environmental conditions, gauge distances, estimate travel times, etc. On the pilots' part their situational awareness is improved thanks to relevant information being better presented, though they are still responsible for the majority of the decision making. The biggest downside is the reliance on the pilot's visuals which necessitates a viewing port. This is mitigated somewhat by the inclusion of small

cameras that allow the onboard system to “look” in the same direction as the pilot, but ultimately these are only supplementary to the pilots own vision.

While the two previously mentioned are mostly found in think-tanks and lesser vehicles, the standard for Types is a **Full CS System**, otherwise known as a **NTS-Reliant**. Here the operator is fully enclosed in the cockpit - no exposed view ports or armored glass enclosures are necessary. The exterior environment is simulated by the onboard system, which is then displayed on monitors within the cabin. This gives the pilot a full range of vision, including peripherals, vastly increasing their situational awareness and response times. Additionally, the onboard system works to actively collate and display relevant data on the display, though the pilot can override this feature if deemed necessary. Further, the system takes an active role in predicting the pilots intentions and adjusting the units performance to match. This can include altering the targeting of a firing weapon, slightly adjusting velocity, correcting balance, pushing or choking the generator, moving the unit's head to change the view, adjusting the hands grip, and so on. This is the true power of the system, which allows the pilot to make full use of Types humanoid form, and as the name implies it is only made possible through the extensive use of nerve tracer technology. The NTS allows the onboard computer brain to respond directly to slight movements and changes in its pilot - even those subconscious ones that they may not be aware of. In order to facilitate this the cockpit is lined with contact points which are necessary for the NTS to function (most commonly on joysticks, seats, and pedals). The pilot in turn must make their bare skin available to these contact points, or have a flight suit with sewn in contact strips that bridges the gap. Whatever the case, without the NTS this CS system does not function to its fullest, rendering it equivalent to an enclosed Integrated system.

Kinesthetic CS Systems go a step further, radically changing the means by which the pilot interacts with the machine. Instrument panels and controls have been largely removed. Instead, the pilot utilizes a full NTS control system that mirrors all of his movements completely. This technology was the same that allowed the implementation of armor jackets and was miniaturized for that purpose, and it operates on the same principle in a Type. The pilot essentially “wears” the machine, with the onboard computer accounting for any discrepancies created by the hugely different scales of the entities in question. While this is not quite as pronounced as an armor jacket, the effect is the same and lends to the alternate designation as **NTS-Jacketed**. Kinesthetic systems reduce reaction delay and are easier for the user to interact with, although these benefits are offset by a higher cost.

Finally, there are **Parallel CS Systems**, in which the pilot's consciousness is directly linked to the machine by way of the nervous system. They are also called **NTS-Bridged**, in that the NTS system takes on the role of mediator between the digital architecture and its living counterpart. It has also been dubbed **Dive Drive** by users on account of the sensation one experiences upon ‘plugging in’. When connected the user shares all of their senses with those of the machine - they experience reality as if they were the machine, losing sense of their physical body. The connection that this creates is unparalleled, allowing them complete control over every aspect of the unit with virtually no delay (and even unconscious reactions are accounted for in this). Parallel CS systems are an emergent technology - they are functional, but their nature is not

thoroughly understood. There are many questions about the long term ramifications of the process on the operator, and even in the short term signs of serious physiological side effects and dissociative disorders have been noted (but not explicitly connected to the bridge itself). As a result the system is mostly used in experimental NEXT Types where costs, along with the pilot's well-being, are only secondary concerns.

Armor

Armor protects a vehicle from damage, acting as a buffer between vulnerable structural parts or internal systems and incoming fire. Whereas structural parts or primary systems can be crippling, armor loss has no negative impact on performance. If anything, armor is purpose-built to be destroyed.

Armor is broadly classified based on the protection it offers, rather than the specific material or make up of it. **Ablative** armor isn't really armor at all, so much as it is extra material added on top of the frame. Manufactured ablative armor does exist for the budget conscious, but more often ablative armor is jury-rigged from whatever is available in the field - sheet metal, lumber, masonry, or any sufficiently hard material that can be bolted onto the structure in a pinch.

Standard armor is just that - the benchmark for mass-produced, military-grade, armor plating. These are usually a single layer of rolled steel or aluminum (depending on the desired weight and performance). **Polymer** armor uses alternative plating that has better characteristics than basic steel, but with only a slight increase in cost. Examples include ceramic (Chobham plates), polyurethane, and plastics, all of which have characteristics that deflect, absorb, or otherwise redirect force away from the structure. **Hardened** armor instead uses upgraded alloy plating, such as titanium-uranium blends, which are more expensive than the alternative materials used in Polymer armor, but are even better at withstanding direct damage. **Composite** armor is the pinnacle, combining elements of polymer and hardened armor into a combination plate for unparalleled protection. It's not invincible, but layering super strong alloys with energy diffusing material produces the toughest armors currently on the market.

Because armor is mounted on the exterior of the structure it does not take up any space. However, it does add to the design's overall weight and cost. Armor itself has two more important characteristics: Stopping Power and Damage Coefficient. Stopping Power represents how much damage the armor diffuses from an incoming attack, as well as the armor's total integrity. As armor comes under fire it progressively loses effectiveness, represented in plates being shredded, melted, or otherwise crumbling away. The rate at which this happens is determined by the armor's Damage Coefficient. Each hit whose damage equals or exceeds the armor's DC reduces stopping power by 1. Ablative armor is the exception and it acts instead as just extra kills on top of the structure with ablative armor losing SP first before damage moves to the structure and internals.

Class	Cost, Stopping Power
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1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10	10
11	11

	Damage Coefficient	Cost Adjustment
Ablative	None	-50%
Standard	1	None
Polymer	2	+25%
Hardened	4	+50%
Composite	8	+100%

Command Armor

Command Armor is a second skin of armor mounted on the exterior of a vehicle. Its primary purpose is adding an additional layer of defense above and beyond normal armor. Unlike normal armor it also provides space to mount additional systems, essentially creating an alternate “form”. Command Armor is designed to be quickly purged from the hull, similar to a pod.

There are drawbacks to Command Armor. It increases the cost and weight of the design, and unlike normal armor it takes up space in the structural parts that it is mounted on (more specifically the purging system and quick-change mounting for the armor). Additionally, bridges have to be created so that the CS System can properly interface with systems that are mounted in the command armor, again taking up an amount of space in the structural part that hosts the connection. Finally, the command armor itself may interfere with certain cost multiplier systems.

This can be used to create a “suppression” effect in which the systems are subdued while the armor is present and resume normal operation once it has been purged. While this can sometimes be an intended flaw (again to reinforce the concept of a distinct form for the design), it can also be corrected by applying the cost multiplier system to the command armor as well.

Command Armor uses the same rules as standard armor with the following exceptions:

- Command Armor takes up an amount of space equal to its damage coefficient. Ablative takes up 0 space, Standard takes up 1, etc. You may apply space efficiency to Command Armor, but you cannot split or move the occupied space - command armor always takes up space in the structural part that it is mounted too.
- Command Armor may be built with binder space. Each space created costs 1 SP and increases the cost of the Command Armor by 2 CP. Any parts installed in the binder space are only available while the Command Armor is mounted and intact.
- Command Armor can be mounted and purged in the same manner as a pod. Command Armor can be purged with a Ready action (multiple pieces of Command Armor can be purged with the same action if the pilot wishes), and mounting Command Armor takes one-tenth of the normal time needed to change armor.
- Any cost multiplier systems have their effects negated for as long as the Command Armor is mounted (even if it is destroyed), unless the cost multiplier has also been applied to the Command Armor. If the Command Armor does not share the cost multiplier, then it must be removed entirely before the system can resume normal operation.
- Incoming damage is applied to any Command Armor, then normal armor, then structural parts.

Ablative cannot have binding

Additional maneuverability penalty for weight? Crit can disable the purge system, meaning the armor has to be torn off manually

Shields

Shields are essentially hand-held armor plates designed to increase survivability on a budget. They provide more protection for the cost than mounted armor plating, but they occupy hand space. Shields cover the side they are held on and can be used to actively block incoming fire beyond that, but even so they should not be considered a substitute for regular armor.

Shields may be built with binder space, sacrificing protection in order to make room for supplemental parts. Installed parts can only be accessed for as long as the shield is held and intact which limits their overall utility. They can still be used as effective offensive weapons in this case, but being the first subjected to damage generally precludes more expensive or fragile parts from being installed.

Class	Cost, Stopping Power
1	5

2	6
3	7
4	8
5	9
6	10
7	11
8	12
9	13
10	14
11	15

Damage Coefficient: A shield may purchase a Damage Coefficient using the cost adjustments listed under Armor.

Defensive Bias: A Defensive Bias is added to Defense rolls where the shield is being used to block, but subtracted from the AR of any weapons installed in the shields binder space as well as the shield itself as a weapon.

Defensive Bias	+5	+10	+15	+20	+25
Cost	+10%	+20%	+30%	+40%	+50%

Vulnerability: A shield may be built with a weakness in order to reduce its cost. A shield with a weakness treats any DC as half against attacks of that type, and it may not be used for Defense rolls against those attacks. Listed below are standard vulnerabilities:

- Melee or Ranged
- Kinetic, Thermal, or Chemical weapons.

Each vulnerability reduces the final cost of the shield by 25%.

Binder Space: Each space created costs 1 SP and increases the cost of the Shield by 2 CP. Any parts installed in the binder space are only available while the Shield is held and intact.

Weapons

The diversity of armaments employed on the modern battlefield is staggering. Traditional ballistic weapons remain dominant, but have yielded in part to the advent of high-tech energy and chemical weapons. Even melee combat has found renewed purpose, and with it a slew of reimagined and reinvented weapons have been put into use.

For Types specifically one of their greatest advantages is the ability to field many, many varieties of weapon parts. Beyond the wealth of parts purpose-built for Type use, many conventional weapons have been upscaled, resized, or otherwise adapted for their use. Many designers found a shortcut by simply reusing existing blueprints, a practice that reached its height by the third generation of Type development.

The following sections serve to classify weapon parts into general categories based on their shared characteristics. In that sense they should not be considered exhaustive, but rather sets of guidelines that are exclusive to one another and that establish a process by which new weapon concepts can be drafted. It is not necessary to always do this as there is a variable panoply of already manufactured munitions and blueprints on the market that can be adapted, but ultimately whether to do so or to start from scratch is a decision left to the designer. The following terminology is used repeatedly for weapon parts:

Damage: The base damage of the weapon. Generally speaking Thermal weapons have a slightly lower damage for the cost, while Chemical weapons have slightly higher. At the Type scale each Kill of damage is equal to 20 Hits.

Cost: The base cost in CP of the weapon before cost multipliers are added. In the case of ammunition, the multipliers are only applied to the ammo and not the weapon (and vice versa).

Range: The base range of the weapon. Thermal weapons have a slightly higher range compared to Kinetic weapons and Chemical weapons have shorter range than both. At the Type scale each point of range is equal to 50 meters. Melee Weapons and some Ordnance have a range of 0. In this case they may be used only against targets within reach, or they may be thrown based on the users throwing distance.

AR: The base Accuracy Rating of the weapon. Thermal weapons are significantly more accurate than traditional ballistic based weapons.

Ammunition: Kinetic, Chemical, and certain Thermal weapons require ammunition in order to function. Ammunition is tracked as a number of Shots, where each Shot is enough ammo for one hit. Groups of shots (i.e. magazines, belts, clips, etc.) are purchased and tracked as Reloads. There is no limit to how many shots can be in a given reload, so long as space and cost requirements are taken into account. Cost and cost multipliers for ammunition are separate from the weapon - a cost multiplier for ammunition only increases the space and cost of the ammunition and a cost multiplier for weapons only increases the space and cost of the weapon. If a weapon and ammunition both provide a quality (such as Accurate or Maxim), it does not stack.

Handling: The Handling rating is added to any actions that involve the weapon. Most often this would be attacks, but can include other kinds of actions if they would involve the weapon (such as using a knife to cut a rope). Remember that IM can never exceed -0, and any bonus above -0 would be converted into buffer.

Weapon Qualities

The following qualities are shared by all weapon types. For the sake of brevity, they are presented here in a consolidated format. The descriptions below do not include the cost

modifiers, which are instead listed under the weapon type. This is because some qualities are more or less expensive for certain types of weapons, based on how easy or difficult it may be to incorporate that feature. If a quality is not listed at all under a weapon type then it is simply not available - the nature of the weapon makes it incompatible with that quality.

Range Modifier: This modifier is applied to the base range. Modified range values should be rounded up.

Rapid Fire: Rapid fire weapons score an additional hit for every two degrees of success on an attack, up to their Rapid Fire rating. Weapons with this quality consume a number of shots equal to their Rapid Fire rating each time they fire.

Refire: After resolving an attack, a weapon with the Refire quality may declare and resolve additional attacks at -0 IM (regardless of any handling score or other modifiers). You must still pay the action and ammunition cost for these attacks. You take a -15 AR penalty for each additional Refire attack declared. Refire can only be purchased for weapons with a Rapid Fire rating.

Fire Selector: A Fire Selector can only be purchased for weapons with a Rapid Fire rating. When declaring an attack, you may opt to fire any number of shots up to the Rapid Fire rating. If the weapon also has the Refire quality, the fire selector allows you to declare a different number of shots every time you declare a Refire attack.

Set Up: A weapon with this quality must be Readied each time it is fired.

Stabilized: A weapon with this quality never treats the target as any further than long range.

Anti-Missile: These systems are engineered specifically to act as anti-missile intercept devices. When declared the target of a missile attack the Anti-Missile weapon can be used to declare an attack with -0 IM, treating the incoming missiles as the target. Each hit or glance destroys one incoming missile. Anti-Missile weapons can be used like normal weapons, but suffer a -40 AR penalty when doing so. Variable Anti-Missile weapons do not suffer this penalty.

Anti-Personnel: Dubbed “man-killers”, these weapons are purpose built for hunting human sized targets. Anti-Personnel weapons do not suffer an AR penalty when firing at targets below Type scale, but suffer a -40 AR penalty when firing at Type scale targets and above. Variable Anti-Personnel weapons do not suffer the AR penalty against Type scale and above.

Anti-Personnel weapons deal hits to hits and kills to kills.

All-Purpose: All-Purpose weapons combine the function of the Anti-Personnel and Anti-Missile qualities, with the benefits and limitations of both. Variable All-Purpose weapons do not suffer any of the associated penalties.

Multi-Feed: Multi-Feeds can be built into a weapon, allowing it to pull ammunition from multiple sources. Each purchase of this quality adds one feed to the weapon. When an attack is declared you must decide which feed the ammunition is coming from - you cannot feed from more than one source during any given attack, but you can switch sources between attacks. There must still be space available for the additional ammunition (i.e. a weapon with two feeds would need space for both weapons in the same location as the weapon).

Ammo Link: A weapon with an Ammo Link pulls ammunition from an internal or external drum, greatly increasing ammo capacity and reducing the need to reload. This drum can hold any number of shots (so long as there is space available in the case of an internal drum), all of which are treated as a single Reload for rules purposes. Unlike system splitting, a weapon with

an Ammo Link remains functional even if the ammo drum is damaged or destroyed. Swapping to and from an Ammo Link is considered a Reload action with a +1 action cost.

Power Link: A weapon with this quality pulls energy directly from the power system. Each shot consumes EN equal to the weapon's damage. Swapping to and from a Power Link is considered a Reload action with a +1 action cost.

Limited Shots: Weapons with this quality are designed to be fired only a certain number of times before shutting down. The weapons still consume ammunition or energy, but after the listed number of shots their internal components wear out and must be replaced (normal maintenance time to repair, but is free besides the cost of labor).

Cycle Time: This quality requires a number of minutes to pass before the weapon can fire, equal to the quality's rating. The weapon may need to cool off between shots, or it needs to build up energy in order to fire. A weapon with the Cycle Time quality can have the Refire quality and be used for Refire attacks, in which case it goes into its cycle once all Refire attacks have been resolved.

Handy: A weapon with this quality is held for the purpose of taking up space, but does not interfere with the hands ability to function as such. The hand can still pick up other items and manipulate them, even hold other weapons (provided it has the space to do so), but it suffers a -40 penalty to any skill checks or attack rolls using the held items. This penalty does not apply to attacks or checks with the handy weapon itself. Attacks with a Handy weapon are considered both hand strikes and weapon attacks.

Clumsy: A clumsy weapon can only be used to make standard attacks. It cannot be used to declare snap fire, suppressing fire, or overwatch, nor can it be used with any kind of attack substitutes such as throw, restrain, or disarm.

Jam: A Jam rating indicates that a weapon is liable to malfunction every time it is fired. When resolving an attack with this weapon: if the unmodified attack roll is higher than the listed Jam rating, the weapon malfunctions. The attack is canceled and any actions and ammunition spent are lost. A jammed weapon cannot be used again until cleared (a Ready action).

Reliable: A Reliable weapon ignores the effects of the first critical hit they suffer. If the weapon also has the Jam quality and triggers a jam, resolve the attack and then apply the jam. If the weapon also has the Overheats quality, resolve the attack and then apply the overhear.

Accurate: When used with the Aim action an Accurate weapon deals +1 damage, +1 additional damage for each incremental IM penalty accepted. This quality cannot be purchased for weapons that already have the Inaccurate or Clumsy qualities.

Inaccurate: Weapons with this quality cannot be used with the Aim action. This quality cannot be purchased for weapons that already have the Accurate quality.

Overheat: An Overheat rating indicates that a weapon is liable to generate significant waste heat every time it is fired. When resolving an attack with this weapon: if the unmodified attack roll is higher than the listed Overheat rating, the weapon malfunctions. The attack is canceled and any actions and ammunition spent are lost, and any structural parts in which the weapon takes space gains the Overheating condition (in this case of a held weapon, this would be the arm or arms holding the weapon).

Maxim: A weapon with this quality deals full damage on a glance, rather than half (this damage is still reduced appropriately for each degree of failure). This is still considered a glance and does not trigger any effects that require a successful attack or hit. If an attack with a Maxim

weapon is blocked or parried, the object that was used to block takes full damage from the attack. For example, a Maxim kinetic rifle fires at a Type, and the target attempts to block the shot with their shield. Their Defense roll is successful, but the shield still takes full damage from being struck by the rifle.

Reach: Melee weapons with the reach quality are treated as having a range of 1.

Archaic: This quality denotes a primitive, weak, or otherwise ineffective variety of weapon. Armor doubles its Damage Coefficient against attacks from Archaic weapons.

Storm: A weapon with quality consumes twice the normal amount of Shots when fired, and in return scores an additional hit for every degree of success on an attack roll, rather than for every two degrees of success. The total number of hits still cannot exceed the weapon's Rapid Fire rating. Storm can only be purchased for weapons with a Rapid Fire rating. If the weapon also possesses a fire selector then you may opt whether or not to utilize the storm quality when declaring an attack.

Volatile: Volatile weapons are unpredictable. A Volatile weapon deals +1 Damage for every two degrees of success on the attack roll.

Non-Lethal: A weapon or ammunition with this quality deals its normal damage as non-lethal hits.

Tracer: Tracer ammunition is loaded with a chemical additive that combusts during flight, leaving behind a bright visible trail. If an attack using Tracer ammunition is successful, anyone making additional attacks against that target receives a +20 bonus to their attack roll (this bonus does not stack, even with tracer rounds from multiple sources). This bonus lasts until the end of the current round, or until the target moves from its current position, whichever comes first. An attacker must have visuals on the target in order to receive this bonus. Tracers cannot be used to designate targets for indirect fire.

Armor Piercing: When calculating damage, a weapon or ammunition with this quality treats any Damage Coefficients as half of their normal value, rounded down.

Incendiary: A weapon with the Incendiary quality causes the target to burst into flames. On a successful attack, the target gains the Overheating condition in the struck location. Additionally, fire continues to burn on the target for a number of rounds equal to the weapons Damage divided by two, and each turn it deals damage to the target equal to the number of remaining rounds. So a target struck in the core by a 6K Incendiary weapon would gain Overheating in the core and would burn for 3 rounds, each round taking additional damage to the core (3, then 2, then 1, and then the fire goes out on its own). The burning damage is still subject to any armor in the burning location. Additional Incendiary attacks do not stack the burning effect, but do refresh the number of rounds of burning remaining. If the target in the above example were hit again in the Core with an Incendiary weapon, the remaining rounds of burning refresh to 3.

Scatter: Ammunition with this quality fires in tight clusters, rather than a single projectile. When firing at a target within half range, the attack scores an additional glance for every two degrees of success on the attack roll. These glances can be designated to the original target, or they can be delegated to anyone adjacent to the target (reference rules for walking fire). When firing at targets at half range and beyond any successful hits are automatically converted to glances and there are no additional glances produced for degrees of success.

Sustained: When declaring an attack, weapons with the Sustained quality can commit additional actions to the attack. On a successful hit the weapons damage is applied one

additional time for each additional action committed (so committing one additional action would apply the weapons damage twice on a successful attack). This is still considered a single hit - determine only a single hit location, and Armor or any other damage reducing effects are only applied once. If the attack misses the additional actions are wasted, and the additional damage is not applied to glances. Finally, a Sustained weapon consumes another shot worth of ammunition or energy for each additional action accepted. This quality cannot be purchased for weapons that have a Rapid Fire rating.

Charge: Thermal weapons can be built with internal power banks in order to provide necessary energy. Each internal power bank takes up one space in the same location as the weapon. The power banks can be recharged during maintenance between missions, or with a power link to the unit's generator.

Internal Magazine: Rather than being fed from a reload, shots are stored internally in the weapon (such as in a revolver cylinder or a shotgun tubular magazine). Unlike a standard reload, the internal magazine can only hold so many shots (decided when creating the weapon), and each shot must be loaded by hand one-at-a-time using the Reload action. An Internal Magazine cannot be purchased with an Ammo Link, unless the weapon also has a Multi-Feed (in which case the link would go through the multi-feed, rather than the internal magazine).

Blast Radius: A weapon with a Blast Radius rating is effective against an entire area, rather than a single target. A Blast Radius has an area of effect equal to its rating multiplied by the scaled distance (so a weapon with Blast Radius 1 built at the Type scale would have a 50 meter area of effect). When resolving a Blast Radius attack the following applies:

- The target of the attack suffers a full hit if the attack roll is successful, and is resolved as such. If the attack roll is not successful or if they make a successful Defense check to negate the hit, they suffer an automatic glance so long as they are still within the blast radius of the attack.
- Anyone else in the blast radius (friend or foe) automatically suffers a glance, reducing damage for each degree of failure as normal. They may attempt a Defense check against a glance, but the glance is only negated if the Defense check would result in them being outside of the area of effect.
- For weapons that have a Rapid Fire rating, each shot can only generate a single hit or glance. You cannot score both a glance and a hit with a single attack - the target and anyone else in the area are only ever dealt damage once per shot.

Disruptor: Weapons and ammunition with the Disruptor quality are designed to overload a target's systems and generator. When resolving a Disruptor attack the following applies:

- The target's power system is drained of EN equal to the attack's damage. If the hit location contains a power bank, additional EN is drained from the power bank equal to the attack's damage.
- Auxiliary System and Sensors parts in the struck location are nullified until the beginning of the next round. Primary Systems, Armor, and Weapon parts are unaffected.
- A biological target struck by a disruptor weapon must succeed a Mettle or Body check or become Staggered.
- If the attack is successful, but fails to penetrate the target's armor, the above effects are nullified - no EN is drained from the target and their systems are unaffected, and biological targets are not subject to the Staggered effect.

Smart: Smart munitions carry a rudimentary navigation and guidance system. In order to function the systems require a target lock. The system itself can acquire the lock at the expense of 1 action in addition to the normal action cost for an attack. You must be able to see the target in order to lock on in this manner. Alternatively, a lock can be acquired if the target is under the effect of Tracer ammunition, or if they have been designated by a target designator (in which case the attacker does not need to have visuals on the target). In both of these cases acquiring the target lock does not increase the action of an attack. Once acquired a target lock lasts until the start of the next round, after which it must be acquired again. Smart munitions can be fired without a target lock in which case they simply function as a normal weapon without the Smart quality. Once fired, smart munitions travel unerringly towards their target. They move around obstacles and cover and can account for sudden evasive maneuvers. Smart munitions ignore cover (traveling around it), unless there is no room available for them to reasonably navigate over, under, or around an object. Smart munitions can be fired with no sensors or visuals on the target so long as they still have a target lock. Defense checks to dodge smart munitions automatically fail (Defense checks to block may still be attempted and are resolved normally).

Salvo: A launcher with the Salvo quality is able to fire multiple pieces of Ordnance in a single attack. When declaring a Salvo attack you can fire additional Ordnance of the same type, up to the launcher's Salvo rating. Resolve the Salvo as a single attack - either all Ordnance hit, or they all miss. On a successful hit, determine only one hit location and apply the effects of the Salvo to that location. Damage from the salvo as well as Blast Radius (if any) are additive, but otherwise any other effects or qualities of the Ordnance are applied once. Thus a salvo of two Damage 2 Blast Radius 2 Incendiary missiles would be treated as a single Damage 4 Blast Radius 4 attack, and on a successful hit the target suffers the effects of the Incendiary quality at Damage 4.

Double Stack: Launchers with this quality have a second stack of tubes, doubling their Salvo rating. This quality can only be purchased for weapons with a Salvo rating.

Corrosive: Weapons with Corrosive quality have a continuous weakening effect. On a successful attack, the acid continues to burn on the target for a number of rounds equal to the weapon's Damage divided by two, and each turn it deals damage to the target equal to the number of remaining rounds. Additionally, for the duration of the burning acid, any armor on the target location has its Damage Coefficient reduced by half, rounded down.

Proximity: Proximity Ordnance must be deployed. It may be deployed by the user, or launched if it has a range characteristic. In the latter case resolve the deployment as an attack to see if it is set in the intended location (during this attack roll the Ordnance is not armed and is treated as having 0 Damage). Once deployed, Proximity Ordnance only detonates when certain conditions are met.

- Eligible targets are the same scale as the Proximity Ordnance or above. If the Ordnance has the Anti-Personnel quality, eligible targets are instead Human and Conventional scale targets. If the Ordnance has the Variable Anti-Personnel quality, all scales are eligible targets.
- The Proximity Ordnance has a detection range of 1. If an eligible target passes within this range, the ordnance detonates immediately (i.e. at the same initiative step the target passed within range).

- Detonation of Proximity Ordnance is not resolved as a normal attack. Instead, the target who triggered the detonation suffers an automatic hit and along with any additional effects (treat the attack as a success with 0 Degrees of Success for any effects dependent on the roll result). The target may still attempt a defense roll, but suffers a -50 penalty on the check unless they were aware of the Ordnance.

Timed: Timed Ordnance can be set to detonate after a certain number of minutes have passed, rather than immediately upon impact. The delay is set prior to firing the Ordnance and can be set in one minute increments, up to one hour. The timed ordnance goes off at the start of the turn once the delay expires (so a Timed grenade with a 1 minute delay would not detonate on impact, but would instead go off at the start of the next turn).

Kinetic

Kinetic weapons operate on a simple ballistic principle: a projectile is launched, and on impact transfers all of its energy to the target. In this they have very rarely evolved. Instead, their means of operation, along with the projectile itself, have undergone constant reinvention. Because their damage is only really determined by the mass of the projectile and how fast it can be made to move, Kinetic weapons are very simple to design and manufacture compared to other varieties. The use of a projectile medium does force reliance on reloads, but at the same time ammunition offers a great deal of versatility and influence on the performance of a Kinetic weapon. In this they have commonalities with classes of Chemical weapons and Missiles, so it is important to keep in mind that the defining characteristic of Kinetic weapons is that they deal damage primarily through the directed transfer of kinetic energy.

Kinetic weapons are further subdivided according to their relative power. At the lowest end are **Mechanical** and **Pneumatic** launchers - bows, crossbows, air guns, etc. In this case there is no propellant or casing; the entire round becomes the projectile. They are cheap, light, robust and easy to manufacture, but poorly suited to the modern battlefield and so only find niche use for the most part. **Conventional** kinetic weapons (i.e. firearms) employ a wide range of projectiles, propellants, and casings tailored for different roles and ideal targets. By far they are the most readily available variety of weapon on the planet, and even so more and grander designs are brought to market every year. Beyond that is the realm of experimental and advanced **KEWs** (an acronym for the unimaginatively named kinetic-energy-weapons). KEWs encompass the various branches of rail guns, coil guns, mass accelerators, and the like. In almost all cases, they do not utilize a chemical propellant or casing making them reminiscent of ancient ballistic weapons, though with a high-tech twist. KEWs are capable of incredible acceleration, firing projectiles at many times the speed of sound to grand and devastating effect. The only real limitation becomes developing a projectile that can survive the heat and stress of such speeds, and that aside KEWs can rival and even supersede the destructive potential of true WMDs.

Kinetic Weapons

Damage	1	2	3	4	5	6	7	8
Cost	1	2	3	4	5	6	7	8

Range	3	4	5	6	7	7	8	8
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Damage	9	10	11	12	13	14	15	16
Cost	9	10	11	12	13	14	15	16
Range	9	9	10	10	11	11	12	12

Damage	17	18	19	20				
Cost	17	18	19	20				
Range	12	13	13	13				

AR	20	30	40	50	60	70
Cost	-40%	-20%	-	+30%	+60%	+100%

Range	25%	50%	75%	100%	125%	150%	175%	200%	250%	300%
Cost	-50%	-40%	-25%	-	+10%	+15%	+30%	+50%	+100%	+200%

RF	2	3	4	5	6	7	8
Cost	+50%	+100%	+150%	+200%	+250%	+300%	+350%

Jam	80	70	60	50	40	30	20
Cost	-50%	-100%	-150%	-200%	-250%	-300%	-350%

Handling	-20	-10	0	+10	+20
Cost	-40%	-20%	-	+30%	+60%

Refire: +100%

Fire Selector: +10%

Set Up: -50%

Stabilized: +30%

Anti-Missile: -50%;

Variable +40%

Anti-Personnel: +0%;

Variable +80%

All-Purpose: +60%;

Variable +160%

Multi-Feed: +20%/feed

Ammo Link: +10%

Reliable: +100%

Accurate: +50%

Inaccurate: -20%

Maxim: +300%

Archaic: -80%

Storm: +150%

Internal Magazine: -35%

Clumsy: -40%

Ammunition

Maxim: +500%

Volatile: +200%

Non-Lethal: -50%

Tracer: +100%

Armor Piercing: +200%

Incendiary: +200%

Scatter: +400%

Disruptor: +200%

Smart: +300%

Blast Radius	1	2	3	4	5
Cost (Ammunition)	+100%	+200%	+300%	+400%	+500%

Thermal

Rather than use a projectile medium, the vast majority of Thermal weapons direct energy directly at a target. As a result they are generally more accurate and enjoy a longer effective range than other varieties of weapon, given that they are not beholden to ballistic principles. Additionally, the absence of a projectile frees Thermal weapons from the need for ammunition or resupply. At worst, certain breeds of Thermal weapon (plasma, particle) utilize gasses or matter skimmed from the local environment, but even this does not justify consideration as a limited ammunition source. Instead, they require enormous amounts of energy to fuel their operation. Normally this comes from a vehicle's power system, but they can be built with internal capacitors instead. Whatever the case, a Thermal weapon can function so long as there is energy available to feed it.

There is another downside to Thermal weapons. Being directed energy weapons, they are incapable of indirect fire - they must have a direct line of effect to their targets. One can not lob a laser over cover, by nature the attack must travel in a straight line. Thus they are poorly suited for artillery or fire support roles.

Lasers are the most common variety of thermal weapon. Adapted from the industrial sector, weaponized lasers emit a tight beam of amplified light that burns through anything it comes in contact with. **Plasma** weapons utilize superheated matter suspended in a magnetic field for an even more dramatic effect. While not truly experimental, they have only recently entered production and are known to be somewhat fickle. **Particle Beams** (sometimes called **Neutron Beams**) fire accelerated streams of atomic particles. This creates a sort of "kick" not otherwise found in Thermal weapons, which makes it the only kind of thermal weapon that hampers the target's stability in addition to doing damage. **M-Wave** equipment has also been developed, primarily for defense purposes. These devices project microwave radiation across an entire area making them especially useful for missile defense and area denial.

Thermal Weapons

Damage	1	2	3	4	5	6	7	8
Cost	1.5	3	4.5	6	7.5	9	10.5	12
Range	4	6	7	8	9	10	11	11

Damage	9	10	11	12	13	14	15	16
Cost	13.5	15	16.5	18	19.5	21	22.5	24
Range	12	13	13	14	14	15	15	16

Damage	17	18	19	20				
Cost	25.5	27	28.5	30				
Range	16	17	17	18				

Range	25%	50%	75%	100%	125%	150%	175%	200%	250%	300%
Cost	-40%	-30%	-20%	-10%	-	+25%	+40%	+50%	+75%	+100%

AR	40	50	60	70	80	90
Cost	-40%	-20%	-10%	-	+100%	+200%

Cycle Time	1	2	3
Cost	-10%	-30%	-40%

Shots	1	2	3	5	10
Cost	-50%	-40%	-30%	-20%	-10%

RF	2	3	4	5	6	7	8
Cost	+100%	+200%	+300%	+400%	+500%	+600%	+700%

Handling	-20	-10	0	+10	+20
Cost	-40%	-20%	-	+20%	+50%

OHeat	80	70	60	50	40	30	20
Cost	-50%	-100%	-150%	-200%	-250%	-300%	-350%

Refire: +150%
Fire Selector: +20%

Set Up: -50%
Stabilized: +10%

Anti-Missile: +0%;
Variable +80%

Anti-Personnel: +0%;	Inaccurate: -40%	Sustained: +300%
Variable +80%	Maxim: +250%	Charge: EN available x.05
All-Purpose: +60%;	Volatile: +100%	= CP (100 EN cap)
Variable +160%	Non-Lethal: -35%	Disruptor: +50%
Power Link: +0%	Armor Piercing: +100%	Clumsy: -30%
Reliable: +100%	Incendiary: +50%	
Accurate: +20%	Scatter: +100%	

Chemical

Broadley speaking, Chemical weapons operate by way of inducing a chemical reaction. The characteristics of the reaction and the energies released are difficult to individually codify as separate categories of weapons, and thus they are given a shared classification. The shared trait is the use of chemical payloads, rather than directed energy or cased projectiles. Chemical weapons are reliant on these payloads in order to do damage, thus making them ammunition reliant, and their damage is determined by the reactive potential and effect of the payload itself. Short range Chemical weapons do not utilize any sort of delivery system, instead expelling the chemical payload directly at the target. Conventional flamethrowers operate in this manner, utilizing a pressurized nozzle to spray incendiary agents at a target (thus a Flamethrower is normally classified as a Chemical weapon rather than a Thermal weapon, since it relies on a chemical agent instead of direct energy). Longer ranges are achieved by way of a flechette based delivery system - the chemical payload is loaded inside of hollow flechettes and deploys when it strikes the target. Again, in this case the primary consideration is the chemical reaction of the payload. The flechettes themselves are nominally effective compared to the chemical reaction, and thus they are not classified as Kinetic weapons.

Chemical weapons are valued for their high destructive potential, which for the cost is the greatest of all three varieties of primary weapon parts. However, unlike standard projectile ammunition, chemical payloads cannot have multiple simultaneous effects - they depend on specific conditions and catalysts which would compromise the component reactions when mixed. Payloads are classified by their dispersal method. **Solid** chemical weapons utilize the aforementioned flechette delivery system. These are the mainstay of battle weapons, usually loaded with explosive compounds that are effective against a wide range of targets. **Liquid** deployment systems use pressurized nozzles or some equivalent to spray the payload at short range. This is much more effective at saturating the target, albeit indiscriminate in doing so and horrifying to boot. Many restricted chemical weapons fall under this category such as flamethrowers or acid cannons. **Vapor** dispersals are usually only used for substances such as nerve agents or tear gas, and while they can be extremely dangerous they are difficult to control and are thus not nery common compared to the other two varieties of Chemical weapon.

Chemical Weapons

Damage	1	2	3	4	5	6	7	8
Cost	.5	1	1.5	2	2.5	3	3.5	4

Range	1	2	3	3	4	4	5	5
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Damage	9	10	11	12	13	14	15	16
Cost	4.5	5	5.5	6	6.5	7	7.5	8
Range	6	6	7	7	8	8	9	9

Damage	17	18	19	20				
Cost	8.5	9	9.5	10				
Range	9	10	10	10				

AR	20	30	40	50	60	70
Cost	-40%	-20%	-	+30%	+60%	+100%

Range	25%	50%	75%	100%	125%	150%	175%	200%	250%	300%
Cost	-50%	-25%	-	+20%	+30%	+40%	+50%	+200%	+300%	+400%

Handling	-20	-10	0	+10	+20
Cost	-40%	-20%	-	+20%	+50%

RF	2	3	4	5	6	7	8
Cost	+50%	+100%	+150%	+200%	+250%	+300%	+350%

Volatile: +50%
Fire Selector: +10%
Set Up: -50%
Stabilized: +50%
Anti-Personnel: -50%;
 Variable +40%
Ammo Link: +10%

Reliable: +100%
Accurate: +80%
Inaccurate: -60%
Archaic: -80%
Multi-Feed: +40%/feed
Clumsy: -50%
Scatter: +200%

Payloads
Maxim: +150%
Incendiary: +100%
Disruptor: +100%
Non-Lethal: -50%
Corrosive: +100%

Blast Radius	1	2	3	4	5
Cost	+50%	+100%	+150%	+200%	+250%

Melee

A melee weapon is a sort of living neologism. While the term is thoroughly understood in common use, it is all but non-existent in scholarly study and other “serious” fields of research. The term derives from the French term *mêlée*, from Vulgar Latin *misculāta* “mixed”, from Latin *miscēre* “to mix”, that’s meaning “mixed”, and referring to groups of warriors interlocked in close combat, when devolving into a chaotic scenario without military formation.

Many have come to see the battlefield as having evolved past this primordial chaos, sterilized even. In truth, the delicate conventions of polite warfare can be strained, even broken, given the appropriate conditions, and when they do a conflict is quick to regress into the sort of riotous confusion worthy of being called a Melee. In the confines of an urban environment, or in the hands of the desperate and foolhardy, a melee weapon can be used to surprising effect. Perhaps in silent acknowledgment of this, virtually every uniformed and private military on the planet assigns their troops some kind of melee weapon as part of their standard issue kit. Of course, it may simply be that a knife or hatchet is a useful tool regardless of its merits as a weapon.

Thanks to their humanoid configuration, Types are able to employ Melee weapons as part of their regular inventory. On top of that their advantage in speed and durability allows them to leverage a close quarters fight where it would not normally exist. This has led to a new renaissance of development with ancient designs being refreshed with cutting-edge materials and concepts. Melee weapons are divided into two categories. **Edged** melee weapons concentrate their force into a smaller surface area like an edge or point. This gives them stronger penetrating power, but at the same time reduces their effectiveness against any target that they fail to penetrate. **Blunt** melee weapons, on the other hand, rely on mass and raw impact energy to crush and brutalize their targets. This doesn’t necessarily increase their effectiveness against hard targets, but the concussive nature of such blows means that often the target is suffering internal trauma even while their armor remains intact.

Melee

Damage	1	2	3	4	5	6	7	8
Cost	0.5	1	1.5	2	2.5	3	3.5	4

Damage	9	10	11	12	13	14	15	16
Cost	4.5	5	5.5	6	6.5	7	7.5	8

Damage	17	18	19	20				
Cost	8.5	9	9.5	10				

AR	40	45	50	55	60	65
Cost	-40%	-20%	-10%	+0%	+50%	+100%

Handling	-20	-10	0	+10	+20
Cost	-60%	-40%	-20%	+0%	+20%

Shots	1	2	3	5	10
Cost	-50%	-40%	-30%	-20%	-10%

Anti-Personnel: -50%;

Variable +40%

Reliable: +20%

Volatile: +30%

Set Up: -20%

Handy: +100%

Non-Lethal: -80%

Incendiary: +50%

Disruptor: +50%

Sustained: +100%

Accurate: +10%

Inaccurate: -40%

Clumsy: -50%

Maxim: +100%

Reach: +80%

Archaic: -40%

Armor Piercing: +30%

Ordnance

Ordnance weapons are a class apart from the rest. They share many characteristics with primary weapon parts, but the reason they are given a classification of their own is their means of operation and intended battlefield role. Ordnance are massive secondary weapons meant to give a unit a strong punch to supplement their primary loadout. Each individual piece of Ordnance is far more devastating for the cost, but they are exhausted entirely on use. You may build a single cruise missile ideal for taking out an armored target, but unlike a standard weapon part, you get that single cruise missile - no reloads, no additional weapon characteristics. If you call for additional missiles, the designer must commit additional space and resources to each one individually. This means that there are no rapid fire Ordnance, although salvo launchers can make up the difference in part.

Missiles are the most common Ordnance, being self-propelled, guided rockets fitted with a wide variety of warheads that make them suitable for a wide range of applications. Everything from missile packs to ballistic missiles, bazookas and rocket launchers falls under this umbrella.

Bombs are similar to missiles but are not self-propelled. Usually the extra space is used for larger warheads, making them more dangerous than standard missiles. Traditional bombs are only fitted to aircraft almost exclusively, while grenades and other kinds of hand-bombs are employed at every level. **Mines** are useful for defensive purposes. They are designed to trigger when a certain condition is met, such as an enemy coming into proximity.

Ordnance

Damage	1	2	3	4	5	6	7	8
Cost	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8
Range	4	5	6	7	8	9	9	10

Damage	9	10	11	12	13	14	15	16
Cost	0.9	1	1.1	1.2	1.3	1.4	1.5	1.6
Range	11	11	12	12	13	13	14	14

Damage	17	18	19	20				
Cost	1.7	1.8	1.9	2.0				
Range	14	15	15	16				

AR	20	30	40	50	60	70
Cost	-40%	-20%	+0%	+30%	+60%	+100%

Range	0%	25%	50%	75%	100%	125%	150%	175%	200%	500%
Cost	-50%	-40%	-25%	-10%	+0%	+10%	+25%	+40%	+50%	+200%

Range	1000%	3000%	5000%
Cost	+450%	+1450%	+2450%

Blast Radius	1	2	3	4	5	6	7	8	9	10	20
Cost	+100 %	+200 %	+300 %	+400 %	+500 %	+600 %	+700 %	+800 %	+900 %	+100 0%	+200 0%

Salvo	2	4	6	8	10
Cost	1	2	3	4	5
Double Stack	+200%				

Stabilized: +10%

Anti-Missile: -50%,

Variable +40%

Anti-Personnel: -50%;

Variable +40%

All-Purpose: No Change;

Variable +100%

Accurate: +25%

Inaccurate: -25%

Clumsy: -10%

Reliable: +10%

Maxim: +50%

Volatile: +20%

Armor Piercing: +10%

Incendiary: +50%

Scatter: +10%

Disruptor: +50%

Smart: +25%

Corrosive: +30%

Proximity: -30%

Timed: -50%

Boosters

While vehicles are able to propel themselves thanks to their actuators and power system (walking, running, leaping, or driving on wheels or treads), such maneuvering is fairly limited. Booster parts exist to afford a unit a much wider range of movement options. They enable faster acceleration, turning, and can greatly exceed the max speed of the basic actuators. In the case of aircraft boosters present their primary means of locomotion (lacking limbs/wheels/tracks of their own) and give them their characteristic speed and agility in the air.

However, there are several practical limitations to boosters. The mass of most designs demand tremendous amounts of force in order to actually achieve the sort of maneuvering described above. This translates to a need for tremendous booster output, which in turn necessitates an equally tremendous space and energy investment. Moreover, there is a necessary consideration for the operator and any crew or passengers - while a vehicle's structure can withstand a considerable amount of force, the occupants are very much human and thus more susceptible to the forces at play during sudden starts, stops, and turns.

Thus Boosters should be considered a supplemental movement option rather than a primary means of locomotion (for most vehicles at least). They simply consume too much energy during operation to be active for any prolonged amount of time. While this isn't necessarily a glaring weakness, it does create a major barrier in the way of achieving true sustained flight - especially for Types. Boosters allow a Type to leap hundreds of meters and can even allow it to hover in place for several minutes, but anything more is beyond most designs. Without wings providing additional stability and lift generation there is simply no way to achieve ongoing flight using Boosters alone, at least short of an endless supply of surplus energy.

Still, in the hands of an experienced operator, even stock Booster parts on a mass-produced Type can be used to lethal effect. While they cannot take to the sky at a whim, such a unit can still quickly and effectively traverse any battlefield - outflanking enemies and running literal circles around conventional vehicles without sacrificing any of their offensive ability in the meantime. Thus Boosters are considered a staple part and have widespread use and availability.

Booster parts come in a wide variety depending on the desired performance and the profile of the vehicle in which they are installed. They range between weak but efficient boosters designed for lighter units to very very powerful boosters that require a large amount of energy,

which only heavier units can provide large enough generators for. Even the length and color of the exhaust flame varies depending on how that specific model operates or even the manufacturer (Star Road utilizes a chemical additive to achieve a brilliant white exhaust flame that is part of their brand and marketing, for example).

Booster parts have two primary characteristics. The first is **Max Boost** i.e. the maximum MA output of the part. Max Boost determines the baseline characteristics of the booster part - it's cost, kills, and space requirement. The second characteristic is **Boost Efficiency** i.e. the amount of EN necessary for that booster to generate 1 MA of thrust for 1 minute. This functions as a cost multiplier with more efficient boosters using less EN but having greater CP and space requirement in return.

Max Boost

Max	10	20	30	40	50	70	100
Cost	1	2	3	4	5	7	10

Max	200	500	1000					
Cost	12	15	20					

Boost Efficiency

Boost	1	2	3	4	5	7	10
Cost	+150%	+120%	+100%	+60%	+30%	+10%	-

Boost	20	30	50	100				
Cost	-50%	-100%	-200%	-500%				

Extension Boosters

Extension Boosters (sometimes referred to as Emergency Boosters) are a variant of standard booster parts designed to execute a specific movement, rather than sustained thrust. This allows for a unit to quickly rotate, turn, stop, or otherwise suddenly move a small distance. While active they have a much higher output than standard booster parts as they are designed to complete the maneuver as quickly as possible. As a result their EN consumption is much higher for the amount of thrust generated and they are not able to be made more or less efficient. Unlike boosters they cannot be used for incremental or sustained movements - when the Extension Booster is used it engages and stops functioning immediately thereafter.

There are two classes of Extension Booster. **Linear Extension Boosters** which create thrust in a specific direction (up, down, left, right, backward, and so on. Useful for executing quick

dodges) and **Rotational Extension Boosters** (rotating the unit on its axis, usually 90° or 180°. Useful for quick turns or righting a unit that has fallen over). In either case the specific maneuver executed by the part is determined when it is purchased and cannot be changed later. A forward linear extension booster would propel the unit forward (relative to its facing) and a quarter rotational booster would rotate the unit ninety degrees in a desired direction (again, relative to its current position). It is worth noting that rotational extensional boosters are slightly more flexible than linear ones, in that they can rotate the unit in any direction along its axis (i.e. a quarter rotational extension booster can turn a unit ninety degrees left or right each time it is activated).

Activating a Extension Booster can be activated as a Move action or as part of a Defense action made to dodge. In either case, the movement using the Extension Booster is resolved at 0 action cost and 0 IM (before any applicable penalties) rather than the listed action cost and initiative modifier. Because extension boosters create sudden and instantaneous thrust they always exert the maximum Gs on the pilot and any crew or passengers.

Boost	1	2	3	4	5
Cost	3	6	9	12	15
EN	10	20	30	40	50

Secondary Systems

Secondary Systems, as the name implies, are supplementary to a design. Unlike Primary System parts, they are not critical to the operation of a unit. They are still useful but their absence does not render a vehicle or Type unusable. A critical hit to the sensors may render a unit blind but alive, but the same cannot be said if the power system is destroyed. Still, neglecting secondary systems can severely hamper a designs potential, so they should not be taken for granted.

Certain secondary system parts are listed as cost multipliers, rather than having a set cost or space requirement. In these cases, the multiplier is applied to the final total CP cost of the design, but does not increase the space requirement of any other parts.

Sensors

Sensor parts provide supplemental performance to the baseline offered by a unit's CS System. By default the CS System provides the equivalent of a normal human beings sight and sound (or, rather, the pilots ability to see and hear is not impeded while in the vehicle thanks to the CS System). For the sake of consistency, this baseline is noted as a 2 mile/3 km visual range and a 600 ft/180m audible range. Anything beyond this, including more sophisticated means of communication and detection, the design will need to incorporate sensors.

The below list offers a comprehensive (but not exhaustive) list of parts that are intended for various roles. Any number of these systems may be purchased, so long as there is space available for them. Multiple of the same part may be purchased in which case they do not function simultaneously and instead offer redundancy so that one comes online as the other is damaged or destroyed. Finally, the Powered option listed below is not itself a sensor part. Instead, it is an upgrade for any other listed sensor, increasing its range and performance considerably by feeding it directly from the unit's power system. It has no effect on its own and is not considered a separate part in and of itself. Thus, a Powered Basic Communications Package would be a single part taking up only a single space but costing 8 CP.

The statistics presented below assume the sensors are placed in a Head part. If this is not the case, reduce all listed numeric values of the sensor (range, targets tracked, etc) by 20%. Furthermore, there is a -20 AAP imposed for any rolls or checks involving those sensors.

Basic Communications Package: Standard part enables radio communication up to 10 km (6.2 miles). This equipment is capable of both voice and data transmission and has a limited encryption and resistance to jamming. They are also designed to be physically resilient and are made of universal components, allowing a damaged or destroyed unit to be switched out easily (one tenth of the normal maintenance time). **Cost:** 4 CP, 1 space, 2 Kills.

FSO Communications Package: Free-space optical (FSO) parts utilize light to transmit and receive communications, rather than standard radio waves. This makes them super-secure, almost impossible to intercept, but they have several limitations compared to standard comms. First, they rely on a directional connection, meaning that the signal must have an uninterrupted straight path to the intended receiver. Any objects in the path of the light beam will break the signal and cause comms to drop. Second, they struggle in dense environments and poor atmospheric conditions. This is again related to the beam's need for an uninterrupted path to its destination. Finally, even with the other two factors taken into account, they have limited range compared to standard radio comms. However, for all their troubles the security they offer is top notch. FSO comms operate so quickly that they can't be interfered with or jammed, outside of physically moving an object in their way to disrupt the beam, and they can only be detected by an infrared sensor, and even then only if that sensor is observing the transmitter or receiver at the moment of transmission. They transmit data over one hundred times faster than a standard radio system and are equivalent to high-end fiber-optic cabling, save that there are no cables involved. All told, the FSO part is perfect for clandestine operations where stealth is the priority above all else and it is often used by special forces teams to maintain secure contact while in the field. FSO comms are effective up to 2 miles (3 km), but their range drops 500 m (1,900 ft) in adverse weather or dense environments like a city or forest. **Cost** 3 CP, 2 space, 3 Kills.

Video Communicator: This part does not provide a sensor range on its own, but instead piggy-backs off of other systems in order to facilitate video transmission and receiving. The quality of the video and the stability of the connection depends on what other parts are installed, with stronger sensors providing better range and more consistent quality. The video communicator can also be used to record and archive video, writing the information directly to

the onboard storage in the CS System, and it can do so even when there are no other sensor parts installed. **Cost** 1 CP.

Radar: Radar systems utilize radio waves in order to detect and track targets rather than for communication. The part periodically releases a “pulse” of radio waves and then measures the time it takes for them to reflect off an object and return to the receiver. By releasing many such pulses very quickly, the system is effectively able to determine the size, velocity, and location of the objects relative to the unit. This process is called “ranging”. The radar is able to track up to 20 different targets at a range of 24 km (15 miles). The system can be tuned to track specific targets as a priority (to avoid losing a primary target in a saturated environment) or it can be set to filter out certain classes of objects. This filter works on scales, and it can be set to only display targets falling in certain scales (such as Conventional and Type scale only, or Type scale exclusively). Radar cannot effectively track targets below Conventional scale, and is also unable to operate effectively in object-dense environments (such as cities or forests). In the later cases, the Radar system instead tracks targets above the sky line or tree line (usually 50 ft), and loses the target below that. **Cost:** 2 CP, 1 space, 1 Kills.

Spotting Radar: Spotting radars are several magnitudes more powerful than standard radar parts and are normally only mounted in fortifications or large warships. Their enhanced performance comes from additional external components that are incorporated into the standard design, namely a large rotational transmitting bar, dome, or dish. This external transmitter allows them greater range and detecting ability without needing to tap into the power system. Simultaneously, the unit comes with an expanded sub processor that allows it to identify and track more targets simultaneously. All of this comes at the expense of a significantly increased space requirement, so usually only dedicated scouting units will use this over standard parts. Additionally, the external transmitter is unable to detect targets less than 50 m/150 ft above the ground, a blindspot as a consequence of the wide range optimization. That aside, the stock spotting radar part has a range of 100 miles/160 km and is capable of tracking up to 200 targets simultaneously and can filter objects in the same way as the standard radar part. **Cost:** 6 CP, 6 Space, 3 Kills.

Radio Detector: Essentially the receiver component of a radar absent of the transmitter. It is calibrated to detect and track radio waves, and to that end the part can effectively distinguish between ambient or background waves, short or long waves, civilian or military channels, and the pulses used by standard radar systems. While the part itself does not jam, intercept, or otherwise interfere with detected radio signals, it is able to notify the pilot when they are being picked up and how many are being detected. **Cost:** 1 CP, 1 space, 1 Kills.

Sonar: Sonar parts are similar to radar, but they utilize pulses of sound in order to detect and track objects. They are significantly more accurate, but have a much shorter range than standard radar set ups. They are not limited by object density, and in fact perform better when there are more surfaces for the sound to bounce off of. When active, each pulse of the Sonar creates a snapshot of the environment up to 100m (300 ft) around the source. The snapshot is great for establishing bearings and landmarks but is unable to track movement actively (one can only compare the relative position of objects between from one ping to the next). Range is increased ten times underwater, but drops to zero in a vacuum. The sounding of the sonar is not audible to the human ear, but can be picked up by sensors at twice the listed range. This means the sonar can be detected at ranges farther than it can itself detect, and this should always be

kept in mind when deploying sonar in a threat zone. Furthermore, significant sources of ambient noise can “blur” the image, effectively jamming the sonar (at least in the area around the source of the noise). **Cost:** 6 CP, 3 space, 3 Kills.

Sound Amplification: This part is designed to pick up sounds in the immediate vicinity of the vehicle, something that can potentially save lives in urban environments especially by sniffing out an ambush or hidden attackers. It’s also commonly employed by paramilitary forces conducting security forces, again thanks to its ability to pick up minor sounds in the immediate vicinity. Sound Amplification parts are able to pick up sounds as low as a whisper (about 30 decibels) but have a range limited to only 100m (300 ft). **Cost:** 1 CP, 1 space, 1 Kills.

Optics - Infrared: Infrared imaging, sometimes called thermal imaging, is done by measuring the output of infrared radiation from an object. All objects emit some amount of infrared radiation, with hotter objects emitting proportionally more radiation. IR optics then convert this radiation into a visible format. The primary battlefield applications are night navigation and target detection, both of which are accomplished by measuring heat in the environment. Night vision allows a unit to traverse the dark without being blinded and without a visible light source giving away their own position (this is the iconic mono-green display common to passive night vision optics). Thermal imaging displays a full range of colors and temperatures and is used to pick out hotspots from within the ambient heat of the environment . IR optics are also used to detect FOS comms, targeting designators, proximity sensors, and any other system that relies on the band of non-visible infrared light. Stock IR optic parts have an effective range of up to 2 miles (3 km) within which they provide night vision and can pick out smaller heat signatures (human sized and below). Larger signatures, such as those of a vehicle's generator, can be detected up to 4 miles (7 km) away. **Cost:** 1 CP, 1 Space, 1 Kills.

Optics - Ultraviolet: UV Optic parts pick up light in the ultraviolet spectrum that is normally invisible to the human eye. There is limited use for such a device in battle and instead these are more common in the industrial and medical sector. The primary purpose of UV optics is to detect organic matter - blood, saliva, and other bodily fluids - that have degraded and cannot be seen normally. Secondly, UV can pick up fluorescent dyes and compounds such as those used in tracer rounds or in security marks on bills or confidential documents. Again, the utility in battle is questionable (as tracer rounds are already visible in the normal light spectrum) but from a forensic perspective UV optics can be useful for sussing out hidden messages and counterfeit documents. Thus UV Optics are usually included in AJAX or Types used by Paramilitary forces and are otherwise uncommon outside of them. Stock UV Optics parts have an effective range of 1000 ft (300 m). **Cost:** .5 CP, 1 Space, 1 Kills.

Optics - Magnification: While this part does not give a unit access to a new range of sight, it does allow the magnification and enhancement of the vision it already has. This is accomplished by two different enhancements working in tandem - improved physical components that are more precise and expanded sub processes that can better interpret and clean the image being captured. Magnification is rated by level, with each level offering better fidelity than the last. This does not increase the effective range, but instead allows the unit's vision to be more precise (and it is worth noting that this causes the area being viewed to proportionally decrease). Where a human sized target spotted at 2 miles away with standard visuals is difficult to make out, 2x magnification would have it appear as if it were twice as close (i.e. 1 mile) and would make previously indistinguishable details become apparent. Stock magnification starts at 2x and each

level purchased doubles the maximum magnification level (i.e. 4x, 8x, and so on). Typical military-grade parts offer a maximum of 32x magnification (after this point the view area is so narrow as to become useless), though this is not a limit on what could be hypothetically constructed (scientific equipment, for example, will call for far greater precision than 32x would provide). **Cost:** .5 CP/magnification level, 1 Space, 1 Kills.

IFF Target Analyzer: This part mates a super processor with a massive internal data storage to create a high performance target analyzer. At a basic level the IFF part can recognize designated friendly, enemy, and neutral targets and feed the information back to the pilot, limiting friendly fire incidents and collateral damage. However the true value of the system is that it is able to make active analysis and speculative projections beyond what is immediately obvious. This allows it to provide information on a target's parameters, armaments, armor density, durability, fuel level, and more. The system has a 65% chance to immediately identify stock, mass production parts. This drops to only 30% if the parts are specialty, custom, or have been modified in some way. Truly unique never-before-seen designs are impossible to identify, but even then the system can catalog this new data automatically for future use. Should the IFF fail to identify a target it can still provide speculative analysis, projecting parameters based on observed performance of the target. **Cost:** 5 CP, 1 Space, 1 Kills.

Motion Tracker: The motion tracker uses a projected infrared field in order to track movement in an immediate area. Objects passing through the projection break the IR beams, signaling the operator that something has been detected. On its own this part does not provide visual or sensor information on a target, only its presence and movements within the projected field. Still this is extremely useful in urban environments, especially for conventional vehicles that tend to have severe blind spots. The range of the sensor is 150 ft (50 m) and because the projected field is direction it can only detect motion in the open, it cannot detect movement inside a building or behind cover. **Cost:** 1 CP, 1 Space, 1 Kill.

Target Designator: Targeting Designators are used by forward forces in order to provide telemetry for long-range bombardment from supporting elements. This is done by two different components working in tandem. First, the designator fires a series of coded laser pulses at the target and measures the return. This provides general ranging information that can then be transmitted via standard comms. Second, the laser pulse scatters off of the target and into the air where it can be picked up by smart munitions. These scattered beams allow the munitions to precisely track the target up to the moment of impact, hence their unneering accuracy once a lock has been established. Since a target designator is not reliant on a single process, it is difficult to counteract once deployed. General radio jamming can hinder the transmission of the initial targeting data, but does nothing against the laser scattering. Poor atmospheric conditions can limit the laser scattering, but the initial targeting data can compensate for this. The only practical countermeasure for ECM operators is to counteract the target lock directly through a mix of several jamming methods applied at once. Acquiring a target lock is resolved as a Use a Skill action and Systems check on part of the operator. If successful, allied units become aware of the location and range of the target and may declare attacks against it, even if they would not normally be able to do so. Furthermore, attacks declared against the designated target receive a bonus equal to the operator's Systems skill development. Because the target designator operates using a directional laser, the unit must have line of sight to the intended target in order to acquire and maintain a lock. Otherwise the effect of a target designator expires at the start of

the next round after it is used. Target Designators have an effective range of 1.5 miles (2.5 km).

Cost: 4 CP, 1 Space, 1 Kills.

Electronic Countermeasures Suite: ECM suites are a variant of standard sensor parts that allows the unit to participate in electronic warfare. Even though they share many standard components, the ECM suite entirely sacrifices its ability to function as a sensor and is not able to collect any sensor information on its own. Instead the operator can engage the ECM to dump “noise” into an environment, overwhelming enemy equipment and rendering it useless. ECM suites can perform the following functions:

- **Radar Jamming:** By propagating decoy signals and masking friendly radar signals, the ECM suite can hamper radar sensors. This may be used to make more targets appear than actually exist, to hide the velocity of a friendly target, increase the signature of a target to appear larger than it actually is, or to give incorrect range on a target - making it appear closer or farther than it may actually be.
- **Radio Jamming:** The ECM suite can dump excessive radio noise in order to degrade the target's communication link, ultimately disrupting it altogether.
- **Target Jamming:** When the unit carrying an ECM suite is subjected to a target lock from a targeting designator or a weapon with the Smart quality, it can attempt a special Use a Skill action to engage the ECM suite at -0 IM. If successful, the lock, and any benefits from it, are immediately lost.

ECM Suites have an effective range of 6.2 miles (10 km). The ECM does not provide any passive jamming effect, it must be directed by an operator in order to function (a Use a Skill action and Sensors check). They work best when directed against a specific target within range, but they can also be used to target an area up to 300 ft (100 m) but suffer a -30 penalty on checks. As another alternative they may deploy jamming to their entire effective range simultaneously but suffer a -60 penalty on checks to effectively jam targets. **Cost:** 8 CP, 2 Space, 2 Kills.

Electronic Counter-Countermeasure Suites: ECCM suites are themselves a variant of ECM parts designed to actively alleviate the effects of jamming on friendly forces. They do so by acting as a high powered signal booster facilitating communications that would otherwise be completely disrupted. ECCM suites can perform the following functions:

- **Radar Counter-Jamming:** The ECCM suite provides additional processing power for analyzing radar returns and can apply a sensor logic that ignores procedurally generated decoy signals created by a jammer. It can also cooperate with a standard radar processor in order to compare incoming signals and ignore any discrepancies, further defeating attempts to falsify range, size, or velocity of a target.
- **Radio Counter-Jamming:** By quickly hopping across radio frequencies the ECCM can create a stable radio channel that outpaces frequency changes from the jamming source. More powerful ECCM parts have the added ability to polarize transmissions thereby filtering out any signal that does not also match the polarization setting.
- **Home-on-Jam:** While an ECCM cannot restore a target lock that has been broken, it can track back the source of the jamming signal and feed that back as targeting data. This is a special Use a Skill check with 0 IM, and if successful the attacker may switch their target to the source of the jamming signal and they receive an additional bonus on the attack roll equal to the ECCM operator's Sensor skill.

- **ECM tracking:** Even if not being used to actively counter jamming attempts, the ECCM can be used to identify and track jamming signals within range. This returns the number of active sources, the approximate direction and distance of active sources, the approximate power of active jamming sources, and how the jammers are being employed (i.e. jamming radio in an area versus radar for a specific target).

ECCM Suites have an effective range of 6.2 miles (10 km). The ECCM does not provide any passive jamming effect, it must be directed by an operator in order to function (a Use a Skill action and Sensors check). Unlike the ECM suite, ECCMs can not be employed in a general area. They can be used either to alleviate the effects of jamming on a specific target, or they can be used to counter a specific jamming that is currently ongoing in an area. In the later case they suffer a -40 on their Sensor check to counter the jamming. **Cost:** 1 CP, 1 Space, 1 Kills.

Powered: Any of the previously listed sensor parts can have their performance increased by reserving energy directly from a unit's power system. Powered can be purchased multiple times. Each time, all numerical aspects of the sensor improves by +20% and the operator receives a +5 bonus to Systems checks with that part. **Cost:** +4 CP and the powered part reserves an amount of EN equal to its total CP cost.

Crew

Normally the cockpit offered by a unit's CS System only has enough room for a single occupant (in this case, the operator). In order to accommodate additional crew (or passengers) a design will need to have space dedicated to seating and control extensions. Crew members act as a force multiplier, allowing the unit to perform beyond what would be possible for the operator alone. Additionally, since crew members typically have dedicated roles they are better able to specialize in a given task without presenting as a weakness for the unit as a whole. In short: a crewed vehicle can simply do more simultaneously than a single operator counterpart.

That being said, crew accommodations are not common among Types. This is partly because it is antithetical to the Types role, and partly because it is considered an unnecessary investment (both in budget and additional personnel). In contrast, crew upgrades are almost ubiquitous among conventional vehicles and remain prolific even in think-tanks (where the enhanced computer-brain is considered a crew member of its own). This is because the crew members serve to make up for many of the glaring weaknesses normally present in conventional designs, allowing them to perform adequately on the modern battlefield for only a fraction of what a Type or NTS costs.

Duties for the crew are categorized in four roles: Commander, Operator, Gunner, and Systems. While these roles are presented as exclusive from one another, nothing demands that each crew member has only one role, or that each role can only be represented once. For example, it is common for the vehicle's commander to also fill the systems role where they can monitor the battlefield when they are not actively giving orders. **Commanders** are responsible for organizing and directing the efforts of other crew members. Besides the presumed authority they have over the other members of the crew, the Commander sets the initiative for the entire vehicle at the beginning of a round (thereafter crew members act as individuals, though the Commander

should still direct their efforts). **Operators** are responsible for the vehicle's drive system and movement. This makes them primarily a defensive and supporting role, mitigating exposure to incoming damage and providing an advantageous and stable platform for return fire. Since they have full control of the unit's movement they are also capable of limited offensive action, either by engaging in hand to hand combat or by utilizing hand-held weaponry. **Gunners** are responsible for the unit's primary weapon systems and engaging targets designated by the Commander. While they have access to hand-held weaponry they do not have the full control over movement that the Operator does and so cannot engage in hand to hand combat. Further the Operators control of the vehicle for movement takes priority over the Gunners need to aim any hand-held weapons. **Systems** are responsible for directing sensor parts and other secondary systems to collect information and feed it back to the Commander and to provide support for the whole crew. In most vehicles they are a secondary consideration (either absent entirely, or as an additional role for another crew member). However, for scouting units or especially those equipped with ECM/ECCM parts the Systems role is usually given to one or more dedicated crew members.

In combat crew members operate as individuals and track their own initiatives with the exception of the Commander, who sets the starting initiative of the entire crew. The actual actions they can take depend on the crew seat and what roles it has access to (the cockpit seat provided by the CS System has all roles by default). If one crew member uses a system or part, it is tied up until that action is fully resolved. For example, if the Operator declares an attack using a hatchet at -20 IM, the Gunner could not also declare an attack with a wrist mounted rocket launcher in the same arm until the hatchet attack is resolved. Similarly if a Systems crew member is using an ECM part to jam the enemy's communications, the Commander could not intervene and use that same ECM part until the jamming attempt was resolved. Thus it is important that the crew stays in communication with each other and cooperates to accomplish their goals, and that designs allocating crew space sufficiently capitalize on the crew's abilities.

Passenger Seat: This provides additional space for a passenger to ride comfortably, but with no access to any of the systems. Two passengers can squeeze into a single seat (including crew seats or the CS System cockpit) but it is extremely uncomfortable. Most people can't stand to be in such conditions for any more than a few hours and in combat both people would have their normal actions reduced by half and suffer a -40 AAP and initiative penalty. **Cost:** 1 CP, 1 Space.

Partial Crew Seat: These seats are set up with limited access to the unit's parts and are thus ideal for dedicating specific crew to a specific role. When adding this part to a design you must designate which of the four roles the seat provides access too. **Cost:** 2 CP, 1 Space. The seat can be upgraded for additional roles at the cost of +2 CP for each additional role added.

Full Crew Seat: The full crew seat is essentially a clone of the default CS System cockpit and provides full access to all of the unit's systems. Just like the standard cockpit the full crew seat has all roles by default. **Cost:** 5 CP, 1 Space.

Power Banks

Power Banks are flexible capacitors designed to expand the standard power systems EN storage capacity. Normally this serves to feed thermal weapons, booster, or powered sensor parts and expand the longevity of design that relies on such parts. However, a charged power bank can also stand in when the main power system fails, though this would rapidly drain stored power.

Power Banks do not generate EN on their own. They are charged in the hangar prior to deployment, and from the excess EN produced by the unit's generator. At any time the operator can choose to transition energy away from the power system's excess EN pool and into a power bank, so long as it does not exceed the power bank's storage capacity. Thus the power bank can be charged in the field depending on the power system's normal refresh rate.

When acting in place of a generator, EN is instead consumed from the Power Bank directly. The amount of EN consumed is equal to the excess EN that would normally be provided by the generator, and the rate of consumption is determined by the power systems refresh rate. These principles in conjunction can be used to create a design that eschews the standard generator, radiator, and fuel load, instead relying on a charged power bank to provide power. While this saves on cost and space, such a design would have an extremely limited lifespan in the field, limiting it to use in garrison forces and defensive deployments that do not stray far from a hangar.

EN Capcity	20	40	60	80	100
Space, Cost, and Kills	1	2	3	4	5

Automation

While standard CS Systems support their operator by taking over the bulk of computational burden, Automation goes a step further - being capable of independent decision making and action. They can act in the same way as a crew member; taking on a specific role and manning weapons and sensors. In the most advanced iterations they can pilot the entire vehicle with a degree of ability close to that of an actual living human.

Automation is classified into three levels. **Drone Autonomy** are the most basic parts, being capable of performing limited, predefined tasks. A gun drone fires a gun, a piloting drone pilots, etc. In this case they are capable of complex problem solving in order to accomplish their task, but they have no ability to make decisions or otherwise alter or modify their goals to match a changing context. A gun drone will fire at designated targets, but it will not define its own targets. A pilot drone will fly to a specified location but will not decide what to do when it arrives. **Conditional Autonomy** are more advanced parts that are usually programmed for a range of complimentary tasks. This is the realm of mundane AI. Rather than being programmed to

complete a specific action, they are capable of enough lateral thinking to understand their own parameters and make decisions on how to best achieve a given goal. This gives them a broader understanding of the context in which they exist, and thus enhanced performance. A gunner program can now prioritize targets based on the threat level they present, a pilot program may alter its flight path to avoid poor atmospheric conditions, etc. **Full Autonomy** systems are experimental, on the forefront of understood science. Universally such parts are one-off unique designs that are capable of replicating human-level reasoning. Unlike the previous two systems, this design is not limited by predefined routines. For all intents and purposes it is its own entity capable of complex value judgment and decision making. How and if a personality emerges from this is on a case-by-case basis. In any case this part is fully capable of taking on any task that a human being could, and can even learn and adapt over time.

Automated parts take up 1 Space and have 1 Kill regardless of their cost. Automation can be installed in place of crew, in which case it takes up the space that the human being would normally occupy (or put another way, an automated part installed in a crew seat takes up 0 space). The role that the automated part can take is limited by the actual crew seat in the same way as a normal crew member (meaning that adding automation to a gunner seat is still limited to a gunner role). In combat, their number of actions is determined only by their development in the relevant attributes (see below), with the exception of Full Autonomy which offers two additional actions by default, on top of what is provided by attributes.

Automated parts do not have their own Core and Celerity scores - their development in these two attributes is determined by the attributes of the vehicle they are installed in (or, rather, these attributes would be 00/00 given that they do not have bodies of their own). Their development in the remaining three attributes (if any) is determined by the level of automation:

- **Drone Autonomy (6 CP, 1 Space, 1 Kills):** has no additional development in any attributes - they are treated as 00/00 for all purposes. Drone Automation starts with one of the two general skill packages and has a development equal to +20 in those skills. This level of automation has an express purpose (using either the roles listed under Crew, or the designer may establish a new purpose when creating the drone). When acting outside of its purpose a drone suffers a -20 AAP. Drones have two actions a turn and are not able to develop their skills or attributes and cannot learn new skills or specializations.
- **Conditional Autonomy (12 CP, 1 Space, 1 Kills):** starts with an Awareness Score of 25/70, but no development in any other attribute (treated as 00/00). Awareness may be developed with an increment of +0/+5 at the cost of 5 CP. Conditional Automation starts with one of the two general skill packages and has a development of +20 in those skills. Skills may be developed up to +30 at the cost of 2 CP per +1 in the skill. Specializations in a skill for the cost of 10 CP and may be developed up to +10 at the cost of 2 CP per +1 in the specialization. New skills cannot be learned or purchased.
- **Full Autonomy (24 CP, 1 Space, 1 Kills):** starts with an Acumen, Awareness, and Mettle score of 25/70. These attributes may be developed at increments of +5/+5 for the cost of 5 CP per development. Full Autonomy starts with one of the two general skill packages and has a development of +20 in those skills. Skills may be developed at the

cost of 2 CP per +1 in the skill. Specializations in a skill for the cost of 10 CP and may be developed at the cost of 2 CP per +1 in the specialization. New skills can be purchased at the cost of 20 CP. Additionally, full autonomy allows the budding intelligence to advance its skills and learn new skills like a normal person in addition to purchasing development directly. There is no cap on skill development for this level of automation - it is free to develop its skills and specializations up to the normal maximum.

General Military Package: Defense, Close Combat, Ballistics, Operate, Ordnance, Systems

General Domestic Package: Academia, Humanities, Engineering, Medicine, Operate, Systems

Environmental Conditioning

Most vehicles are capable of operating in a range of mundane environments - snow, rain, mud, heat, etc. However, outside of those circumstances their systems will start to fail. Heavy snow and freezing cold provides little traction and saps away heat and stored energy, scorching deserts can overtax radiators and overwhelm air filters, and so on. There is also a necessary consideration for the occupants, who are appreciably more fragile than the vehicle itself.

Environmental conditioning hardens a vehicle against the effects of one or more environments. Each conditioning is a cost multiplier rather than a specific part - conditioning does not take up its own space or have a kills value. Instead, it represents the use of specialty components throughout the designs, ones that are optimized for the given environment over their stock counterparts. Thus Environmental Condition is handled as a cost multiplier that increases the final CP value of the design overall (but not the space, weight, or cost of any individual part).

Alternatively, a designer may encounter a situation in which it is desirable to only apply conditioning to a specific part. Most commonly this would be used to construct a conditioned command armor "shell" to protect the unit in a hostile environment without increasing the entire cost of the design. Presumably the unit's exposure to poor conditions would be limited and therefore it makes sense to only afford them temporary protection. In other cases individually conditioned parts can be added to an already existing unit as a stop-gap before a long and costly rebuild. Whatever the motivation behind it, when applying conditioning to individual parts, only those parts have their costs increased. At the same time, only those parts are protected from the negative effects of the environment - the rest of the design remains vulnerable and suffers penalties as normal. The only exception is command armor, which as long as it is intact provides the benefit of environmental conditioning to the whole unit. If any portion of command armor is destroyed or purged (or if the command armor doesn't cover every structural part in the first place) then the environmental conditioning is compromised and the unit suffers any negative effects as normal.

Low-Temperature: Temperatures below freezing (32°F/0°C) have an immediate negative impact on a vehicle. Exposed surfaces while ice over and harden, making them rigid and inflexible and possibly locking moving parts in place. The cold saps energy away from exposed power systems and any power banks. Fluids will start to freeze inside the lines and so on. The exterior environment also becomes dangerous. Ice and snow offers poor footing and conceals the local

terrain. Deep snow offers a hazard on its own and vehicles are at risk of sinking into snow banks or snow pits and becoming suddenly trapped. Flurries of snow can blind optics and reduce the effectiveness of communications. All of these elements become worsened the lower the temperature gets, with the coldest places on Earth dipping as low as -130°F/-90°C.

Low-Temperature Environmental Conditioning involves extensive reworking of a design's internal systems. Heaters are placed liberally throughout the structure and networked to the radiator, which in turn pumps waste heat throughout the interior to minimize ice build up. Exterior facing parts are given an extra layer of insulation that prevents them from locking up entirely when the temperature drops. Fluids are laced with chemical additives that help prevent the formulation of ice crystals and thereby prevent freezing. Optical and Communication parts are optimized for directional performance in order to minimize the interference from sudden changes in atmospheric conditions. The motive system is also optimized to apply force over a larger area than normal, giving the vehicle a bigger footprint which in turn reduces the force applied on any given spot. This prevents them from sinking into snow and becoming immobile, although there remains a risk of being unable to spot hazardous terrain. **Cost Multiplier:** +5%.

High-Temperature: The threshold for high temperature malfunctions can be deceptively low for a vehicle. Prolonged exposure to temperatures starting at 84°F/30°C can cause significant performance issues and the exposure time drops as temperatures rise (with the hottest places on the planet reaching 134°F/57°C). This is because a vehicle's temperature will always run much higher than the external temperature due to its nature. While a stock power system would have no problem whatsoever operating in ninety degree weather, the internal temperature on such a day can run in the excess of four hundred degrees! Well above the point that water boils and within the threshold for other combustible materials to spontaneously ignite. The radiator quickly becomes overtaxed in such conditions and starts to pull more and more energy until it fails entirely. Thermal expansion can cause stress throughout the structure, potentially damaging weaker components. Any fluids are obviously at risk of evaporating, and even if they remain intact the chemical reactions that they facilitate may be compromised by extreme heat. Exterior dangers are not as dramatic for these environments. There is a constant risk of fire and the presence of sand or cracked ground may offer poor footing, but otherwise there isn't a threat greater than the heat itself.

High-Temperature Environmental Conditioning involves a total internal rebuild. The bulk of the work is creating layers of vacuum seals all throughout the structure. Heat struggles to pass between the layers of vacuum seals which in turn act as major insulating, thereby creating a stable internal temperature. The radiator is reinforced with additional heat pumps so that in the event that the seals fail it can more effectively force waste heat back into the environment. Finally, the exterior of the vehicle is given a heat-reflective coating which serves to reflect solar radiation away. It has no impact on ambient heat, but does help minimize the build up of heat from daylight. **Cost Multiplier:** +5%.

Low-Pressure: On Earth, low-pressure and high altitude environments are synonymous. In both cases the air becomes thin enough to interfere with the normal operation of a vehicle. The most severely impacted are aircraft and other flight-able vehicles, who find themselves unable to operate as effectively as the air pressure drops. Terrestrial vehicles suffer as well as their

internal fluids expand and air intakes struggle to keep up. Stock vehicles become noticeably sluggish in such conditions (usually 8,000 ft/2400m above sea level in regards to altitude).

Low-Pressure Environmental Conditioning involves sealing and pressurizing the internal structure. This also includes sealing compounds that work to automatically restore pressure when a seal has been breached. A special sub processor is added to the CS System that is dedicated to monitoring air intakes and can alter their performance on the fly in order to capture as much air as possible. Finally, storage and filtration tanks are added that can recycle the air that the intakes do collect, further making up the gap caused by the lack of oxygen in the environment. **Cost Multiplier:** +5%.

High-Pressure: High-pressure environments on Earth exist underwater almost exclusively. However, the water itself is not necessarily the primary concern (it does impact the vehicles performance of course, but not so dramatically as the atmospheric pressure that the water imparts). Sealing the vehicle against the effects of water is trivial. What is an issue is the pressure. In the ocean or any sufficiently large body of water, every thirty or so feet of depth doubles the pressure exerted on the unit. This quickly causes structural components to buckle and implode, and even then internal fluids and gasses will become compressed under the intense pressure, reducing their effectiveness.

High-Pressure Environmental Conditioning starts with sealing the exterior of the vehicle (which on its own eliminates the threat of the water itself). The same process used by Low-Pressure Environmental Conditioning is used here so that the seal can be restored immediately if punctured. The structure is then thoroughly reinforced against buckling, with stock materials being upgraded to more rigid counterparts and additional ribbing added wherever possible. This doesn't necessarily increase the structures durability in regards to weapons fire, but it does make it very difficult to crush through force alone. Extra oxygen tanks are added along with a CS System processor expansion that maintains the internal pressure of the vehicle (again in an effort to minimize the risk of implosion due to pressure). Little can be done about the exterior environment (especially underwater), but sealing the unit allows it to perform underwater in a reduced capacity (where an unsealed vehicle, weapon, or booster would be rendered completely unusable if not outright destroyed). **Cost Multiplier:** +10%.

Vacuum: The most difficult environment to overcome is hard vacuum. Normally, that means space. Everything functions differently in space, and space-bound vehicles must be redesigned almost entirely as a result. There is no air resistance in a vacuum and few other sources of friction. This makes momentum and motion a significant problem - with nothing to act against it, a vehicle may find itself careening off in some direction with no way to stop itself. Thermodynamics also becomes considerably more dangerous. Heat cannot transfer across a vacuum. Meaning that as a vehicle builds heat the radiator has very few options to diffuse it. Obviously air intakes also stop being an option which means the design has to abandon oxygen dependent systems, or commit to internal storage to feed them.

Vacuum Environmental Conditioning uses the same basic principles as low-pressure conditions but takes them even further. Further effort is given to minimize waste momentum thereby controlling momentum, which includes a dedicated sub processor for analyzing and optimizing

all movements. The cockpit and interior is flooded with perfluorocarbon - a liquid substance that human lungs can breathe like air. The perfluorocarbon provides a much more stable pressurized environment and helps insulate the operator against sudden kinetic impacts and changes in momentum, although breathing liquid takes a great deal of getting used to on the part of the pilot.

There is a further series of modifications made for vehicles intended for re-entry. The forces exerted on an object as it enters the atmosphere are extreme in every way - heat, friction, gravity, drag, resistance are all magnified to their highest points to become an unrelenting pummeling. Even using trajectory to try and mitigate these forces, the most durable vehicle would be consumed in a matter of seconds when subjected to such destructive forces. In order to survive re-entry a vehicle goes through an additional layer of exterior hardening to minimize surface area and provide as much heat resistance as possible. Even so the vehicle must lean into the re-entry when it is happening, essentially becoming an inanimate rock falling through the atmosphere. Attempting to maintain normal flight or even combat is a death sentence no matter how much material a designer puts around the unit! Normal operation can be resumed once re-entry is over. **Cost Multiplier:** +10%. Re-entry conditioning costs an additional +5%.

Stealth and Cloaking

In truth, the best defense is to not be fired upon in the first place. Stealth parts help a unit achieve that by concealing their profile and signature, confusing enemy sensors and targeting systems. While true invisibility simply isn't possible from a practical perspective, even delaying target acquisition and forcing hesitation and delay can be a huge boon. However, a combat vehicle is not a dainty thing. Disguising it is a task easier said than done, even if it is not powered down and completely stationary (let alone actively fighting). Thus stealth parts are generally more expensive and offer a lesser degree of protection than something simple like armor and so they should be considered supplemental. That is to say stealth will help a unit survive, but it is not a guarantee of survival on its own.

Like Environmental Conditioning, Stealth and Cloaking are cost multipliers applied to the overall cost of the design. Also like Environment Conditioning, Stealth Command Armor can be constructed which provides the benefits of stealth for as long as it is intact.

Conventional Camouflage: Conventional camouflage is one of the basic principles of warfare, even survival. Simply put - it is making something look like something else. This may be done by altering the physical shape of a vehicle, changing the paint, adding material such as foliage to help it blend into an environment. When purchasing conventional camouflage determine the intended environment (i.e. forest, desert, urban, snow, and so on). So long as the vehicle is in that environment and remains stationary it cannot be detected by passive observers (either optical sensors or normal human vision). This applies only to standard optics - varieties such as IR/thermal or UV optics are not hindered. If the enemy is actively searching for the camouflaged vehicle they must succeed at a hard Instinct or Systems check (based on if they are using

sensors or their own vision). If the vehicle moves, enters combat, or otherwise does something other than remain stationary then the camouflage is foiled.

Alternatively, conventional camouflage can be used to make a vehicle appear as something else rather than trying to conceal it. This could be used to make a NTS appear as a conventional vehicle or a high-performance NEXT Type appear as a mundane mass-produced model. In this case the passive observer is fooled by the disguise automatically while anyone suspicious of the deception requires a hard Instinct or Systems check to spot the discrepancies. Succeeding this check does not give the observer knowledge of the true nature of the camouflaged unit so much as it tells them that it is not what it appears to be (i.e. they do not immediately know that it is a high-performance NEXT, but it is definitely not a mundane mass-production model). Unlike camouflage for disguise this effect is not spoiled by normal combat UNLESS it does something that would obviously hint at its true nature. For example, a conventional tank disguised as a civilian vehicle can drive around normally without compromising its disguise, but if it fires its main gun the disguise will be spoiled since the civilian vehicle would obviously not be equipped with a tank cannon. **Cost:** +5%

Dazzle Pattern: Unlike other stealth parts, dazzle patterns are not designed to conceal a vehicle. Instead they are meant to make it for observers to determine its features, facing, range, velocity, and so on. They have a long history (having been introduced during the second world war) but have only been used periodically due to mixed results. The principle of irregular paint schemes and countershading to mask the features of a vehicle are sound but ultimately simplistic in that they do not do anything against the myriad of high-tech sensory equipment employed in modern warfare. Still, they are occasionally used and at the very least give the vehicle a unique appearance.

A unit equipped with a dazzle pattern is harder to target than normal. An attacker is unable to target the vehicle with an Aim action unless they succeed at a normal Instinct or Systems check (if the vehicle is stationary, this does not apply and they may Aim normally). Furthermore, all attack rolls against the dazzle patterned vehicle suffer a -5 penalty. Again, dazzle patterns are not enough to actually prevent target acquisition entirely, but they do make it harder than it would be normally. Beyond that, any checks to determine the heading, speed, range, or profile of the vehicle (identifying its weapon or structural parts) suffer a -5 penalty as well. This also includes checks to identify the vehicle using an IFF Target Analyzer and to designate the vehicle using a Target Designator. **Cost:** +5%

Active Camouflage: Active Camouflage is the holy grail of military stealth technology. It follows the same basic principle as conventional camouflage but, thanks to development of cutting edge materials and hardware, is able to adapt to a changing environment and combat conditions. This means that the camouflage is not immediately foiled just because the unit became active or engaged in combat. It's still far off from the idea of true invisibility, but as far as what is possible to achieve, active camouflage parts are the best on the market. Their biggest drawback (aside from the cost) is that they consume EN while active, and while the EN consumption rate is not particularly high it does make the system vulnerable to power failure.

While the camouflage system is active and the unit is stationary or on standby it cannot be spotted by a passive observer, and attempts to actively detect it require an impossible (-40) Instinct or Systems check. In combat or when the unit is otherwise moving or actively engaged, it still cannot be spotted by a passive observer but the difficulty to detect it drops to -10. In the later case the check may be attempted everytime the unit does something that would normally reveal its position i.e. firing a weapon, interacting with a visible object, colliding with a building, and so on. Just like conventional camouflage, active camouflage only hinders mundane optics - it has no impact on IR or UV sensors. **Cost:** +25%. While in use the active camouflage part consumes 5 EN per turn/minute.

Sensor Cloaking: While the previous parts are predominantly focused on preventing visual detection, Sensor Cloaking instead serves to foil other kinds of detection systems. It does not go so far as an ECM suite which more actively seeks to target and jam enemy sensors. Instead, sensor cloaking aims to prevent the vehicle from being detected entirely (or to otherwise mask or alter its signature should it be picked up). Thermoelectric plating added to the internal structure allows the vehicle to alter or eliminate its thermal footprint and foil IR sensors. UV optics are defeated using light emitting diodes to produce counter-illumination that blends the vehicle in with the lighting of the local environment at the ultraviolet wavelength (so that it is visible to the naked eye but blends in on UV sensors). Sonar and Radar are both defeated using absorptive coatings on the exterior of the vehicle that helps lessen and mask the signature of the vehicle on those sensors. The only thing that sensor cloaking is not able to affect is motion detection and sound amplification sensors, however both of which have very short effective ranges and so this is not considered a major weakness.

In practice, a vehicle protected by sensor cloaking cannot be detected passively by IR, UV, Radar, or Sonar sensors. Actively searching for the cloaked vehicle incurs a -15 penalty to Instinct or Systems checks, although this penalty drops to -5 if the vehicle is engaged in heavy activity (such as combat). **Cost:** +15%

Options

Optional parts do not have a significant impact on the performance of a unit. Because these parts are minor they do not warrant their own individual sections. Rather, they provide utility, improve the operator's quality of life, and some even exist only for the sake of vanity (offering no benefit other than being visually impressive). Many of these parts are aftermarket, meaning they are added to an already existing unit at the discretion of that individual owner, rather than as part of the blueprint. Unless otherwise noted these option parts do not take any space.

Sound System: This part incorporates a high-fidelity surround system into the vehicle. While it can act as a speaker system allowing voice communication throughout the cockpit and crew space, the most common use is playing music and recordings. Each part is optimized for the specific design it is installed in to guarantee the best sound experience possible. Compatible with a wide range of digital media and audio formats. **Cost:** 0.2 CP

Liftwire: For Types and other massive vehicles there becomes a very real question of how the operator is expected to enter and exit the cockpit. In the hangar scaffolding and catwalks can

provide easy access, but what about in the field? Enter the liftwire. A high tensile cable fed by a powered winch is lowered to the ground where the operator can grab on and be hoisted back up. It's a quick, clean, simple solution for getting into the cockpit and the cable is rated for up to 600 lbs (272 kg) which is more than enough to hoist two normal adults simultaneously. **Cost:** 0.5 CP

Lock and Alarm: It is taken for granted that civilian vehicles come stock with lock systems and alarms. Many military-grade vehicles do not have such features by default (partly because they are assumed to be stored in secure locations away from the hands of intruders). For the security conscious it is a simple manner to install an equivalent system in their own vehicles. Locks come in two types - key entry and keypad entry. In the former case, a physical key is needed to enter the cockpit while in the later the lock is set up with a keypad and allows access for anyone who inputs the correct code or sequence. An alarm is also installed and designed to go off should the cockpit be opened without releasing the lock. By default the alarm only produces a loud noise, potentially alerting anyone nearby of the break-in. The alarm can be set to send a notification to a paired device (such as a smartphone or computer), and the notification can be set instead of or in addition to the audible alarm. **Cost:** 1 CP

Spotlights: Spotlights on the exterior of a vehicle are useful for signaling and illuminating dark areas. They consume only a nominal amount of power from the power system and are a cheap alternative to actual optics. Standard spotlights have a range of about 2600 ft/800 m. By default they emit a strong white light, but other colors are available. **Cost:** 0.1 CP

Storage: Secure storage within the cockpit or crew space of a vehicle allows belongings to be stashed during transit. This is a more comfortable experience than riding in full kit and has the added benefit of keeping things from flying around the space during a CFIT event. In some cases even more storage space can be purchased to create cargo space for transports (although it does not come with seating, which would instead fall under crew parts). Each storage space can hold up to 200 lbs (90 kg) of material. **Cost:** 0.1 CP. Every 10 storage spaces purchased in the same location also takes up 1 space (or, put another way, 1 CP of storage also takes up 1 Space).

Micromanipulators: Micromanipulators are miniature limbs used for fine work. They are common in the industrial sector, especially electrical engineering, maintenance, and repair. Micromanipulators come in a pair and each limb is the size of a human arm, although they can extend up to five times their normal length should the situation call for it. They have a Celerity score equal to 50/70, and a meager Core of 15/40 (they are meant for precision rather than power). Both of these scores cannot be increased and are independent of any development applied to the vehicles actuators. **Cost:** 1 CP

Automated Damage Control System (ADCS): The ADCS system provides limited autonomous repair to vehicles in the field. In response to a command from the operator or the CS System the part releases a horde of microscopic repair bots to the damaged location. Generally repair is limited to external armor or structural parts, although the system can handle further tasks such as extinguishing electrical fires or removing foreign material. Each ADCS system can repair up to 5 Kills worth of damage before its resources and energy are expended and it must be recharged at a Hangar. The system can attempt to repair critical damage, but only has a 50% chance to be able to do so successfully (it is simply beyond what the automated system can handle reliably on its own). The rate at which the ADCS can repair damage is half

the listed time for standard repairs (the repair bots work with machine efficiency once deployed).

Cost: 5 CP, 1 Space.

Vehicle Drop-Chute: The concept of deploying armored support directly into combat from the air has long been a goal for military planners. Many Types, NTSSs, and think-tanks are equipped with boosters that give them limited maneuverability in the air, and there are even a few powerful enough to achieve true sustained flight. However, your standard unit would suffer severe damage, potentially destruction, during an air drop, even with boosters taken into account. Drop-Chutes are the mass-market solution to the problem of air deployment for armored elements. While designs vary depending on the manufacturer and the weight and characteristics of the unit being dropped, there are three constant principles in a Drop-Chute. Firstly, a chute or some equivalent drag device. This serves to control the vehicle's speed as it descends and minimize the impact once it makes contact with the ground. Second, a hardened platform or bucket that the vehicle rides in. The primary purpose of the bucket is to ensure the vehicle does not tumble during descent, and it also acts to absorb the brunt of the impact on landing. Third, a limited-use booster system. This is used to correct the vehicle's course or trajectory and provide very limited maneuverability in the air and to provide emergency braking should the chute prove insufficient on its own. Altogether these components work to deliver a vehicle safely to the ground, however they are single-use only. The drop-chute is consumed entirely, destroyed, by the drop and subsequent impact. The speed of a controlled vehicle drop varies but is typically between 60-150mph during which the operator has only limited ability to control their speed, angle, and rotation. Any attempts to maneuver in the air (even dodging incoming fire) should be treated as an Operate check with a -30 penalty. If the check fails the drop-chute still gets the vehicle to the ground but it'll be a rough landing - resolve it as a CFIT event. **Cost:** 1 CP per 10 tons loaded mass.

Re-Entry Capable Drop-Chute: There are limited specialty manufacturers who offer drop-chutes that are capable of surviving atmospheric reentry. The idea is that rapid response forces could travel in the outer atmosphere in order to reach far away targets and then deploy armor or Type elements immediately into combat. Of course the logistical support necessary for such an escapade is well beyond most militaries, but the product was pushed to market nonetheless. Re-Entry Capable Drop-Chutes operate in the same way and have the same rules and limitations as a standard drop-chute, save that they can survive the extreme forces of atmospheric entry. They serve as a cheaper alternative to re-entry conditioned command armor, but they are also only good for one drop just like a normal chute - they are simply destroyed due to the stress of the drop. **Cost:** 3 CP per 10 tons loaded mass.

Thermal Baffling: Thermal Baffling is a process to reduce a vehicle's thermal signature in order to hide it from infrared imaging. This part represents a limited installation of components that redirect waste heat into baffles rather than dumping it into the environment. This lowers the overall heat signature of a vehicle, although it still stands out against the ambient temperature of the environment. While on standby heat baffling reduces the range that a vehicle can be spotted on infrared optics by half. Additionally, enemies suffer a -30 penalty on Systems checks to detect or track the baffled vehicle by heat signature. In combat, or when otherwise running hot, spotting range is not reduced and the penalty to enemy Systems rolls is only -5. **Cost:** 2 CP per 10 tons loaded mass

Acoustic Baffling: Just like thermal baffling does for heat, Acoustic Baffling aims to reduce the sound footprint of a vehicle. Much of the process involves adding insulation or seals to other parts in order to minimize the sound they produce without hindering their performance. While on standby audio baffling reduces the range that a vehicle can be picked up on audio sensors by half. Additionally, enemies suffer a -30 penalty on Systems checks to detect or track the baffled vehicle by sound signature. In combat, or when otherwise going loud, sounding range is not reduced and the penalty to enemy Systems rolls is only -5. **Cost:** 2 CP per 10 tons loaded mass

Ejection Seat: A seat can be upgraded with an ejection mechanism in order to rescue the operator during an emergency. The ejection seat contains a high-powered mechanism that, when activated, propels the occupant out and away from the vehicle (usually at least 100 ft/30m). Once outside the seat deploys a parachute that lowers the occupant safely to the ground. There are several manual overrides that the operator can activate in the event that the automatic systems fail, but even then ejection is not without risk. The system is meant to get the operator away from the vehicle, it doesn't take into account the local environment or any dangers that may be presented. That is to say: it is entirely possible for an ejection seat to remove the passenger from the frying pan and directly to the fire. Still, many pilots at least prefer having the option over being doomed inside of a dying vehicle. **Cost:** 3 CP. Can be installed in the default cockpit provided by the CS System, or in a crew/passenger seat.

Escape Pod: The escape pod is an upgrade to the stock ejection seat. In this case during egress the operator is enclosed in a sealed capsule in order to protect them from hazardous environments. The pod offers 1 Kill worth of protection and has enough air for 30 minutes. Otherwise it has all the same features and limitations as a standard ejection space. **Cost:** 5 CP, 1 Space. Can be installed in the default cockpit provided by the CS System, or in a crew/passenger seat.

Maneuver Pod: The final word in emergency-egress-and-recovery technology, the maneuver pod provides the occupant limited ability to control their descent and trajectory. This is thanks to additional boosters located on the exterior of the pod and a miniature power bank to feed them. The pod has an equivalent MA of 1 and can operate for up to 30 minutes before running out of power. Otherwise it is identical to a standard escape pod. **Cost:** 10 CP, 1 Space. Can be installed in the default cockpit provided by the CS System, or in a crew/passenger seat.

Waste Disposal Unit (WDU): It's not elegant, but many operators swear by their commode. The ability to relieve oneself without having to leave the cockpit makes this one of the most common after-market upgrades ever, especially in Types. Besides comfort it also helps the pilot maintain personal hygiene and safety during prolonged operations and alleviates fatigue. The waste material itself is incinerated by a Types Na-TECC generator, and for vehicles without it is either expelled immediately or collected and emptied during hangar maintenance. **Cost:** .1 CP

Microwave: This simple installation provides an operator with an option for a hot meal while in the field. Cook time and temperature can both be controlled and there are several options for presets or automatic cooking (based on internal sensors tracking the temperature of the food) and some models offer an additional heating element so that the device can function as a toaster oven as well. Even so, this is not a common upgrade. Soldiers in the field are already afforded a plethora of food-on-the-go and while it may not be delicious, it is filling and nutritional and a hot meal can be had outside of missions or during periods of downtime. Between the two there isn't a real need to offer a means of cooking onboard a military vehicle. **Cost:** .1 CP

Kitchen: This adds a full galley-style kitchen with oven, sink, stove top, prep area, refrigerator/cold storage, and dry storage. Like the microwave upgrade this is very uncommon, especially in military vehicles. Only long-range recon units expected to spend months in the field at a time would necessitate a full kitchen facility. Many militaries have dedicated support vehicles with kitchens installed for rather than attempting to do the same with dedicated combat units (except in the case of large warships where the crew is expected to live and fight intermittently). **Cost:** 2 CP, 1 Space.

Bio-Monitor: This is a minor upgrade to the CS System that allows it to monitor and report on the physical condition of the operator/crew. While it doesn't really improve the parameters of the unit it is required due to safety regulations in many groups, especially as those who work with NEXT Types (which often have impacts on the health of their pilot). The bio-monitor can report heart rate, blood pressure, blood sugar level, blood type, volume, and the presence of any unknown or foreign substances (although it is not sophisticated enough to also identify those substances). Some parts may be further tuned for specific monitoring such as the presence of elevated hormone levels or signs of psychological stress. **Cost:** 1 CP.

Operator Crisis Response and Bypass (OCRB): A step beyond a simple monitoring routine, the OCRB features a dedicated subprocessor that is devoted to saving the operator and crews life in the event of emergency. The OCRB is capable of bypassing most bodily functions in order to keep a human being alive. This includes artificially stimulating the heart and lungs (including defibrillation should the heart stop entirely), providing oxygen, hemorrhage and blood loss control, and so on. Some variants are also able to administer drugs (purchased and loaded separately) The OCRB can be manually in response to trauma, or it will activate automatically if it detects loss of consciousness in the operator. In order to function the crew and any passengers have to wear bulky suits that facilitate the emergency treatment. These suits provide no other protection but can be sealed and equipped with external oxygen tanks. The OCRB has development in the Medical skill equal to +30 but is only able to provide emergency, life prolonging treatment or administer drugs and medicine. It is not able to give any sort of longer term treatment nor can it advise a human operator in doing so. **Cost:** 7 CP and includes one suit. Additional suits or replacements can be purchased for .2 CP (\$\$4000).

Cosmetic Enhancements: Despite the efforts by most military units towards standardization and uniformity, most operators and crew will personalize their vehicles. This can be fairly restrained - a minor insignia or color change - or it can be something totally outlandish like inscription, armor shaping, and accessories. Thus by nature cosmetic enhancements are not standardized and are almost always an aftermarket "upgrade" (although eccentric designers may call for such enhancements as part of the initial development). It should be noted that cosmetic enhancements are just that - cosmetic. They have no impact on the parameters or performance of a unit in any way, they merely exist to look impressive. Cosmetic claws may give a Type a intimidating, even devilish appearance, but they are not suitable as weapons. **Cost:** Varies. Minor embellishment like paint or insignias could be as little as 0.01 CP while a major cosmetic like a gold plated sword could easily cost 2-3 CP. The only limitation is the buyer's imagination (how much money they are willing to put up).

Locking Joint: Usually this feature is only purchased for Types which have obvious joints, but it can be used by any vehicle. When active this causes the vehicle's joints to become locked in place. This can be useful for storage or standby modes, ensuring that nothing will shift during

transit. In combat particularly keen operators have employed locked joints in order to give themselves sudden change in stability or advantage in melee combat. There are of course risks to doing so such as having the joint snap entirely when subjected to too great a stress, and obviously there is no possibility for articulation while the joint is locked. When locked the joint retains whatever position it is currently holding and can only be forced by an impossible (-40) Core check. If successful the check breaks the lock and the joint, rendering it free but otherwise useless. **Cost:** 1 CP per structural part upgraded (i.e. all joints in a single arm or leg).

Rotating Joint: Basically the opposite of the locking joint presented above. Normal actuators are meant to facilitate a normal range of human motion (or some reasonable equivalent for more conventional, non-humanoid vehicles). Rotating joints instead offer a full uninterrupted rotation of the joint - head can twist 180°, even 360° around. Same with a rotating arm, leg, even a core. This is most useful to allow a unit to quickly twist and engage enemies that may be trying to flank which makes it common for extremely heavy designs that lack normal maneuverability options. **Cost:** 2 CP per structural part upgraded (i.e. all joints in a single arm or leg).

Self-Destruct System: When activated the self-destruct system scuttles a vehicle in order to deny capture and salvage to the enemy. Usually this is limited to missions where the risk and consequence of capture outweigh the cost of replacing the vehicle (and crew). In order to prevent remote intrusion or premature detonation the system can only be manually triggered from within the vehicle. A one to five minute delay can be set in order to allow the operator and any passengers time to escape. Because the primary focus is scuttling the machine much of the system's destructive force is directed inwards - contrary to popular belief it does not create the sort of violent explosion seen in media. It works by breaching a unit's power system which sets off a chain reaction, ultimately reducing the structure and everything contained within to unrecoverable slag. Mechanically the unit in which the system is installed is destroyed entirely - it cannot be brought back the hangar and repaired and offers minimum salvage only. Anything within the immediate area of the unit (within 30 ft/10 m) suffers a single 20K damage hit automatically. Outside of that range there is no danger (the force of the reaction drops off almost immediately). **Cost:** .5 CP

Remote Observer: While not truly autonomous, these remote controlled drones allow an operator a limited ability to increase their field of view. The observer is battery powered (up to 30 minutes before needing to be recharged) and has a connection range of 1 (150 ft/50m at Type scale) as well as a flight MA of 1 and 1 Kill of damage capacity. Outside of the connection range it falls idle and gently lowers itself to the ground to await recovery. Within the connection range it transmits visual and audio data back to the host unit equivalent to basic sensors but with a range of only 300 ft/100m. Because the observer is small (the size of a soccer ball) it can maneuver into spaces that a normal vehicle or even person couldn't. With only limited range they cannot be used for long range scouting but they are extremely useful in dense or urban environments and are especially common among emergency response paramilitary forces. More expensive variants of the observer can be purchased that have alternative optics, although each individual observer can only have one optical sensor. Observers must be directed by the operator using the operators actions, they are not capable of functioning on their own (see the Automation option if you wish to build independent drones). **Cost:** 1 CP for the basic observer. IR, UV, and 4x magnification observers can be purchased for 2 CP each instead. The

observer does not take up significant space in the host unit while on standby and it passively draws EN from the power system in order to recharge (recharge time is five minutes; does not cost EN).

Domestic Computer: A unit's CS System is optimized for combat and is thus not suited for personal use. Manufacturers offer this upgrade to fill the need of a standard computer for the operator. While the actual utility of such a device is questionable, it is an extremely common upgrade especially among independent pilots and paramilitary forces. This is because it allows the crew to keep themselves busy during long periods of standby, a vital component of running a mercenary outfit that doesn't have full time administrators or logistics staff. Paramilitary units instead use it to access and update databases while in the field or on patrol. **Cost:** .1 CP. The exact performance of the computer varies depending on the buyer's needs and the manufacturer, but as a rule of thumb the domestic computer is ten times as powerful as a modern high-end PC.

Black Box: The stock CS System can record and catalog combat data but is vulnerable to corruption or destruction. The black box option adds a dedicated part that is meant for long term, secure storage that can survive self-destruction or a lethal CFIT event, even direct weapons fire! The black box stores all data and sensor inputs from the last forty eight hours and records general metrics (active and standby locations, pilot logs, location tags) for the last six months beyond that. The physical device itself has 3 Kills of damage capacity and a DC of 8 and is an exception to the complete destruction created by a self-destruct system. It is waterproof up to 2 miles/3 km and heat proof up to 600°F/315°C. While it is physically robust, the actual data is secured with standard encryption which can be bypassed should the box fall into the wrong hands. **Cost:** 2 CP.

Sensor Boom: Similar to remote observers, the sensor boom is meant to give the unit options for extending their sensors into areas they would not normally reach. In this case the sensor boom allows the operator to "peak" around corners or into gaps. This is done by a slim physical extender (the boom) which can reach out or up on command, capturing data that is then fed back to the main sensor parts for processing. This allows the boom itself to be rudimentary since it is only capturing and transmitting raw information. The boom can be extended up to range 1 (150 ft/50 m at Type scale) and can rotate/turn up to ninety degrees at any point along its length. When in use, the boom is treated as the origin point for any sensors and Systems checks (and does suffer the penalty to sensors and Systems checks for locations other than the head). Otherwise the sensor boom is not part of any particular sensor part - if the boom is damaged or destroyed there is no negative impact on the rest of the sensor parts. **Cost:** 1 CP.

Storage - Concealed: Similar to a normal storage unit, the concealed compartment option is meant to hide itself and its contents. This is accomplished by sacrificing overall storage capacity. The hidden compartment cannot be detected passively (by either sensors or a person). One must be actively looking for it (hard Instinct or Systems check, as appropriate). Each concealed storage can hold up to 50 lbs/23 kg of material. **Cost:** 0.1 CP. Every 10 storage spaces purchased in the same location also takes up 1 space (or, put another way, 1 CP of storage also takes up 1 Space).

Winch and Towline: A common utility option, the winch and towline is designed to drag or pull heavy objects. While Types and other limbed vehicles can already accomplish this using their arms, conventional vehicles and think-tanks cannot. The stock towline is 300 ft/100 m long and

rated up to 10 tons (20,000 lbs/9,000 kg), but the actual weight that can be towed is determined by the vehicles actuators and Core score. **Cost:** 0.5 CP

Voice Recognition and Audio Module (VRAM): This module lends a voice to a unit's onboard CS System. The operator can give the system verbal instructions and the system can provide audible responses in return. While this is not enough on its own to improve the performance of the vehicle or operator, it is markedly more convenient than default analog operation. The system voice can be altered and customized (there are literally hundreds of recorded voices available on the market) but it does not have a personality of any kind unless the buyer also pursues Automation. **Cost:** 0.2 CP

Remote Ignition: This simple device allows the operator to initiate the vehicle's start-up sequence from outside the cockpit. Larger outfits will use this feature to prep a unit for launch in the hangar, while independent forces appreciate the flexibility that remote ignition offers. The system can be calibrated to respond to an actual, physical remote, or it can be set to respond to a more general signal sent from a standard computer or radio station. This does not enable any sort of remote piloting (which would fall under Automation), it merely starts the vehicle and runs through any necessary pre-launch checklists or diagnostics. **Cost:** 0.3 CP

Convertible Canopy: This vanity option creates an alternate mode for the cockpit where it is open to air. While a normal cockpit can open and close, the convertible canopy offers a unhindered (and unarmored) view outside without actually opening up. There's little to practically justify it, perhaps for scouting units or as cheap means of egress. Some operators just like the sensation of wind on their face and sun on their skin (especially in non-military vehicles). While the alternate mode is engaged the operator can be targeted and fired upon by enemies. In that case, the canopy acts as cover offering DC equal to the DC of the armor on the core location (if any), but otherwise does not protect the pilot or crew in any way. **Cost:** 0.5 CP

Storage - Exterior: This option creates mounts and cargo racks on the exterior of a vehicle. While the exterior storage has the same capacity as internal storage, it does not take up space. Large amounts of material can be transported at once because storage does not compete for space, with the only limitation being the actual lifting capacity of the vehicle's actuators. However, the drawback to external storage is that while the items are secured, they are not protected. Enemies are free to target the cargo and destroy it, and even stray fire or area of effect attacks can quickly destroy items kept in exterior storage. Further, while the items are strapped down enough that they won't be dislodged by normal movement, even combat, a CFIT event is so chaotic and violent that anything on the external racks will be sent flying. As a result exterior storage is only used for dedicated transport vehicles and haulers, or as tertiary storage for combat units. Each exterior storage part can hold up to 200 lbs (90 kg) of materia **Cost:** 0.1 CP.

Robotic Appendage: The cousin to a micromanipulator, the robotic appendage is meant for heavy lifting rather than precision. Only conventional vehicles or other non-humanoid machines get any use out of this option, as a Type is able to accomplish the same thing using its own arms. As a result this option is primarily marketed to the industrial sector or civilian emergency responders. The appendage itself has a Core score of 60/70 and a meager 25/25 Celerity score. These scores are independent of the host vehicles and cannot be improved or developed. Just like the micromanipulator, a robotic appendage can extend up to five times its normal reach should the need arise. Unlike the micromanipulator **Cost:** 1 CP.

Shower: Less common than a WDU, the shower nonetheless improves the quality of life for operators and crew. In order to minimize space footprint the shower is installed as part of the cockpit or a crew seat. Most of the cost goes into waterproofing the internal electronics and installing a proper plumbing system. Otherwise, the shower is meant to be quick and efficient, providing water in short, high-volume sprays on command (as opposed to the long, continuous operation offered in normal models). Privacy curtain not included. **Cost:** .5 CP

Pylons: Deployable pylons are utilized by artillery units to provide increased stability and recoil reduction. On activation the pylons deploy from the unit's legs (or whatever structure contacts the ground in the case of non-humanoid configurations. Wheels, treads, core, etc) and drive into the terrain. This creates an anchoring effect where the weight of the earth helps hold the vehicle in place. While the pylons are deployed the vehicle is unable to move on its own in any way, and furthermore it cannot be tripped, thrown, dragged, or otherwise knocked down. The only way for an enemy to dislodge a vehicle with pylons deployed is by succeeding at an impossible (-40) Core check (a force so great that the pylons are sheared entirely). In order to activate the pylon a unit must be on firm ground with both feet planted soundly. **Cost:** 3 CP

Landing Gear: A simple addition to a unit that allows it to safely bear its own weight while in transport or on standby. This is less an issue for humanoid configurations or conventional vehicles with wheels or treads and is instead a problem for aircraft and similar designs, as they lack convenient extremities and which to idle. The landing gear also affords a very limited ground MA of 1 which is useful for taxing on a runway or maneuvering into and out of a hangar under the vehicle's own power (rather than being towed). During with a CFIT event an operator can use the landing gear to attempt to absorb part of the initial impact and prevent the vehicle from flipping or rolling. If used in this way the landing gear reduces the chance of serious injury for the operator, crew, and passengers by -10, but are destroyed entirely in the process. **Cost:** .5 CP

Optimization

Weapon Links

Multiple weapon parts may be combined together using links. Linked weapons are fired together as part of a single action, but each attack is resolved separately (with relevant modifiers). If the weapons have different handling scores, the worst of the applies when determining the initiative modifier of the combined attack.

Weapon Link: This link can connect weapon parts of the same type that are located in the same location. **Cost:** 2 CP per link.

Cross Link: Cross links are necessary to connect weapon parts of different types (linking a kinetic rifle and a grenade orngance, for example). **Cost:** +1 CP per link.

Split Link: Split links are necessary to connect weapon parts that are not in the same location (linking a part in the core with one in a pod, for example). **Cost:** +2 CP per link.

Variable Link: Weapon parts connected by a variable link can be fired together or separately at the operators discretion. **Cost:** +1 CP per link.

Weapon Mounts

Normally weapon parts are exposed in whatever location they occupy space, meaning that they can be targeted and destroyed by incoming fire. Weapon mounts integrate the part into the structure so that they are better protected. Weapon parts in a mount cannot be targeted separately from the structural part in which they occupy space (though they are still vulnerable to critical damage and failure from other sources).

Weapon Mount: the default mount protects a weapon part so that it cannot be targeted separately. **Cost:** 2 CP per mount.

Quick-Change Mount: this type of mount incorporates a purging system that allows the weapon to be ejected and quickly replaced. A weapon part in a quick-change mount can be purged with a Ready action. New parts only take a fraction of the time to be mounted into the quick-change mount (one-tenth of the normal maintenance time needed to replace a destroyed part). **Cost:** 3 CP per mount.

Weapon Mating

Weapon mating incorporates two weapons into a single part. They still function independently of one another (unless they are also linked), so the main advantage of weapon mating is reducing the space requirement of the component parts. A kinetic rifle with an underbarrel grenade launcher ordnance is an example of a mated weapon.

When mating weapons, designate one part as the main part. The main parts spaces are unchanged, and each additional part adds half its space requirement to the space requirement of the final part. The Kills of the final part are equal to the Kills of the designated main part, and are not increased by the addition of other parts. Because all parts are combined together into the final part, they all suffer damage and are destroyed together.

Weapon mating does not have a CP cost as the benefits and drawbacks cancel each other out.

Space Splitting

Splitting makes it feasible to mount parts with very high space requirements. When splitting a part notate the main location that the part will occupy - this is used when determining the origin of effects if necessary (for example a spotting radar may have some of its space split into the core but leave the head as its main location to avoid the penalty associated with sensors outside the head). The bulk of the part must remain in the main location; the space occupied in any additional location cannot exceed the space occupied in the main location. Because the part occupies space in the new locations it is vulnerable to critical damage suffered at that location. Any damage suffered at any location is applied to the part as a whole, and the entire part fails if any location in which it occupies space is destroyed.

Space splitting costs 4 CP per additional location.

Space Efficiency

Unlike space splitting, space efficiency reduces the actual space requirement of parts. This is represented as using better materials and miniaturizing the components involved in the construction. Unlike space splitting, space efficiency can quickly balloon in cost. There are three absolute rules that must be kept in mind when applying space efficiency. First, it can only be purchased and applied in whole number increments. Meaning that if a part has a space requirement of 1.5, you can apply space efficiency to reduce the space requirement to 0.5. Second, all space requirements always round up to the nearest whole number during final clean up. This means, in the above example, that the 0.5 space part would be rounded up to 1 space during final calculations. Third, all parts with a space requirement must take up at least 1 space (or, put another way, you cannot through efficiency, rounding, or splitting, reduce the space required to 0). While not all parts take up space, all parts that do take up space must take up at least 1 space.

Space efficiency costs 2 CP per 1 reduction in a parts Space requirement.

Weight Efficiency

Like space efficiency, weight efficiency is used to alter the weight of the final design. Unlike space efficiency, weight efficiency is applied to the whole unit rather than individual parts. Weight changes are used primarily to bring an overweight design below the generator's max weight load, but it can also be used to alter the stability characteristic of the unit.

Weight Efficiency costs 2 CP per 1 ton of reduced weight. Weight efficiency is applied to the unit's dry mass (before ammo and fuel are added in). Weight efficiency cannot reduce a unit's weight by more than half of its starting value (meaning a vehicle with a 50 ton dry mass could only purchase 25 tons of weight efficiency).

Weight Inefficiency

Weight Inefficiency is used to cut a design's final cost by using cheaper, more bulky materials. More savvy designers can use it to alter their designs' stability values. Unlike weight efficiency, the limit on inefficiency is based on CP rather than dry mass. This is because there is a practical limit on how much money can be saved by turning to cheaper materials. Weight inefficiency reduces the final cost of the design by 1 CP per 2 tons added to the unit's dry mass. Weight inefficiency cannot reduce a unit's cost by more than half its starting value (meaning a vehicle costing 50 CP could not reduce its final cost below 25 CP using weight inefficiency). This does increase the weight of the unit according to the new Kill value.

Structural Reinforcement

Structural parts can increase their durability by sacrificing the space normally reserved for other parts. A structural part may sacrifice 1 Space in order to increase its Kills by 1. There is no CP

cost associated with this exchange (the benefit and penalty cancel each other out). This does reduce the weight of the unit according to the new Kill value. Structural reinforcement does not decrease the carrying capacity of a hand connected to an arm.

Structural Reduction

Like reinforcement, reduction alters the kill-to-space ratio of a structural part. In this case space can be created by sacrificing the integrity of the structure itself. A structural part may sacrifice 2 Kills in order to create 1 additional space. There is no CP cost associated with this exchange. The part must have at least 1 Kill remaining (meaning that the designer cannot apply space reduction if it would leave the part with 0 Kills as that would mean that there is no structure at all holding any of the parts together). Structural reduction does not increase the carrying capacity of a hand connected to an arm.

Blueprinting

Blueprinting is the process of committing the detailed technical aspects of a design to writing. At this stage you start to answer the question of how your design is supposed to actually achieve its intended form and function. The best schematics are explicit and extremely detailed offering an engineer a step-by-step guide to fabricating the unit, while the worst ones offer only vague direction and basic measurements. Thus, the better a blueprint or schematic is, the more useful it is going to be. This is also the first stage that relies on a designer's actual technical knowledge. The previous steps were conceptual, in that they dealt with the final goals of a proposed design without taking into consideration practical limitations beyond what are inherent to the Technical System itself. Broadley, anyone can conceive of a design following the Technical Systems guidelines. However, it is an entirely different matter to actually define the concept one has created, and it takes a great deal of technical knowledge and experience (aerodynamics, electrical engineering, mechanical engineering, material sciences, structural design, and so on). Fortunately all of this knowledge is abstracted and consolidated into only a few skills on the part of a character, and a character who does not have such skills can contract or cooperate with others who do.

The biggest investment to Blueprinting is time - 3 hours of work per CP of the design (so a 200 CP design would take 600 hours of work to blueprint - nearly a month of around the clock effort). It is not necessary that the designer take on this entire workload themselves, in fact they could offload the entire blueprinting process onto someone else (so long as they provide an adequate description of their design process). However, if the designer's involvement falls below half of the required workload then they lose sight of the project as a whole and can be considered a participant rather than the main force driving the creation. This isn't necessarily bad, but it means that they don't have a say in the process until the final schematic is prepared - there isn't a chance for them to catch errors early or make corrections during the blueprinting. Additionally, if too many people are involved simultaneously it becomes very difficult to coordinate the work

and keep everything on track towards a single end schematic (-10 to all participants Engineering checks for each participant beyond the third).

When each participant completes their portion of the workload (or at the end of the blueprinting process in the event the designer is doing everything themselves) they must make an Engineering skill check and record their degrees of success/failure. If no one succeeds at the Engineering skill check then the blueprint is simply a failure and all the work and time spent so far is lost - they will need to try again. If at least one participant succeeds at their Engineering check then the overall schematic is completed successfully (or at least enough to start prototyping).

A degree of success in the above Engineering check represents a particularly exceptional portion of the schematic - that it is especially well-defined, easy to follow, or the schematic has hinted at something that will improve the overall efficiency of the design in a significant way. A degree of failure is the opposite - the blueprint is vague, difficult to follow or only makes sense to the person that wrote it, or has created some unintended interaction that will crop up during development. Degrees of success and failure both contribute to the prototyping process and should be recorded. The designer may choose to keep both values, or they may buy out degrees of failure using degrees of success at a two-to-one ratio (but not vice versa). Alternatively, the degrees of failure may be eliminated by simply redoing the portion of the process in which they cropped up. This isn't any faster (as the entire section of work needs to be done again from the beginning to ensure that all issues are caught and corrected) but it is slightly easier - each failed attempt grants a +10 bonus on the Engineering check to create a functioning revision. The bonus only applies when revising **failed work** (i.e. work that resulted in a failed check) and disappears once a successful revision has been created. The designer(s) may choose to revise already functioning blueprints created by successful Engineering checks in an effort to pool more degrees of success but must be cautious in doing so - they do not gain the bonus to their engineering check and furthermore there is a real risk that they fail entirely, creating new flaws in the schematic rather than weren't present before.

There is no restriction on how long a designer can spend working and revising a blueprint, though there are diminishing returns as they approach the limits of their own knowledge and ability. It is not unheard of for one to spend years on years slowly working through their own schematics in order to reach some kind of on-paper-perfection (with no guarantee such a design would ever enter production or even have a single prototype to its name).

Prototyping

For those that are not interested in taking their design to market, prototyping is the final step in the overall design process. By the end they will have a fully functional unit that is ready to take the field, and one that is totally unique to boot. For everyone else, prototyping is the process of producing individual models, all drawing from the same schematic, as a test bed for the design. Much of this stage is experimental in which previously unseen flaws in the blueprint crop up once the vehicle has been fabricated and assembled. At the same time it is possible for a

prototype to be built in such a way that it surprises everyone and performs well beyond expected parameters. While the latter case is exceedingly rare, the impact is so great that the idea of a cutting-edge prototype unit running circles around mass production models remains an enduring image in the minds of the population.

Unlike regular production, there is not a guarantee of total consistency during prototyping. Each construction is going to have its own identity that sets it apart even from other prototypes of the same blueprint. This is because the production is largely experimental and each prototype involves different circumstances and materials. Indeed part of the point of prototyping is to suss out and eliminate as many of these quirks as possible so that a stable model can be presented for bidding and eventual production.

Bidding and Production