BLOOD AND CIRCUITS

V1.1

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The whirring sound of the pump alone occupied the room for a moment. A lull in the heated debate taking place. "What we need to do is decapitate this 'Emergency Response' team in one devastating attack. Kill General Thompson and the whole thing will come crashing down around their heads!"

The Savant hissed and almost rose out of his wheelchair, the whirring sound increased in tempo with his agitation as the pumps on the back of the chair, the pumps then went straight into his back in order to force his lungs to inflate, struggled to keep pace with the beating of his artificial heart "That man is still my friend. Don't ever discuss a plan to harm him again or I guarantee you won't like the consequen…"

The meeting fell silent again, except for the sound of the coughs wracking their frail leader. He sunk back into his wheelchair, eyes rolled back in his head, and it seemed for a tense moment as if he would die right there before their plan could even take shape.

His private nurse pressed a mask of pure oxygen to his face for a moment, and then he was back. The pumps slowed to a regular pace again and he returned to the room, to consciousness, from the brink of death. His subordinates exhaled. This old wreck of a man was the only thing keeping them together. They all knew it. Without him they'd turn on each other like a pack of hungry wolves.

The younger man spoke again, teeth clenched with frustration "All I'm saying is to consider the option Sir. Don't let sentimentality…"

"Ophelia. Laertes."

In a moment the man was on the floor. The room fell silent as the two massive dogs at the old man's side leapt through the air, knocking him from his chair. His moans and their growls were the only sounds in the room for a moment, save for the constant rhythm of the breathing pumps. Finally only the growls and the whirring remained.

"Ophelia. Laertes."

The dogs emerged from under the table, tongues snaking out to lick the blood from their muzzles. They settled back at their master's side, ears cocked for his next command, eyeing the room intently, sizing up targets.

Again the sound of the pumps alone filtered through the room, "Does anyone else have anything to say about my old friend?"

Welcome to Blood and Circuits, an item creation and equipment resource for use with the d20 Modern roleplaying game. This book presents new classes, feats, and options primarily for Smart Heroes, though all heroes will find something in this book to benefit them. For the GM this book also provides a window into weird and super scientific achievements found in literature and comics, allowing for the creation of all sorts of wonders and terrors to fill his campaign with.

CHAPTER 1: CHARACTERS

The Savant paused for a moment as security removed the Captain from the room. A blood soaked cloth covered the mangled ruin of the man's face. He whimpered pitifully as they lifted up the stretcher, "Take him to my operating theater, I'll tend to him when we're finished here."

"No. Liberty Tower and Rock City are too well defended. It's a poor choice for a first operation. Is anyone here familiar with Camp X?"

The Savant smiled as the men shook their heads, "No, I don't suppose you would be. It's been out of service for some time now. It was a training camp during the Second World War for special operations personnel from the United States, Canada and Britain. It was abandoned against my will. A perfect place to begin."

One of the Lieutenants spoke up, brow furrowed with worry, keeping his voice carefully neutral and non-confrontational. No one wanted to be the next faceless mess removed from the room.

"But Sir, if the camp has been abandoned so long, won't that make a poor base for us?"
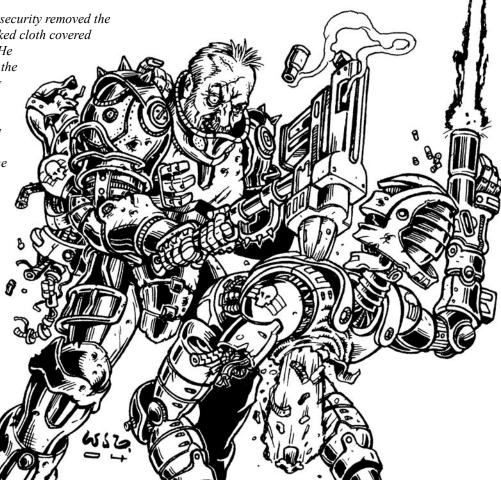
The Savant just smiled again. "There's something there. Something very valuable. It will give us all the advantage we need. Now if there's nothing else, make preparation for an assault."

"An assault Sir?"

"I said the base was abandoned, young man, not unguarded. Expect heavy resistance. Issue EMP rifles to all assault agents. We leave within the hour."

He reached back and touched the hand of the nurse behind him, "Take me to my operating theater. We must tend to the Captain. Ophelia. Laertes."

His men watched as their leader was pushed from the room, flanked by the massive dogs.

Classes

This chapter presents new advanced classes, most aimed specifically at the smart hero base class. These classes specialize in one or more forms of item creation presented later in this book.

Armorer

The armorer loves being in combat but hates getting thumped. To that end he has found better ways to protect himself, allowing him to hang in the most brutal firefights longer. The armorer prefers to be in the front where his creations can be put to the ultimate test of front line fighting.

Table 1-1: The Armorer

Level	Base Attack Bonus	Fort Save	Ref Save	Will Save	Special	Defense Bonus	Reputation Bonus
1st	+0	+2	+0	+0	Armor Affinity +1	+1	+0
2nd	+1	+3	+0	+0	Bug Hunter (Armor) +1	+1	+0
3rd	+2	+3	+1	+1	Bonus Feat	+2	+0
4th	+3	+4	+1	+1	Bug Hunter (Armor) +2	+2	+0
5th	+3	+4	+1	+1	Armor Affinity +2	+3	+1
6th	+4	+5	+2	+2	Bug Hunter (Armor) +3; Bonus Feat	+3	+1
7th	+5	+5	+2	+2	Man in the Iron Mask	+4	+1
8th	+6	+6	+2	+2	Bug Hunter (Armor) +4	+4	+1
9th	+6	+6	+3	+3	Bonus Feat	+5	+2
10th	+7	+7	+3	+3	Bug Hunter (Armor) +5; Armor Affinity +3	+5	+2

Requirements

To qualify to become an armorer, a character must fulfill the following criteria. (The fastest path into this class is through the Smart hero base class).

Skills: Craft (mechanical) 6 ranks, Knowledge (physical sciences) 6 ranks, Knowledge (technology) 6 ranks

Feats: Armor Proficiency (light)

Class Information

The following information pertains to the armorer advanced class.

Hit Die: 1d8

Action Points: 6 plus one-half character level, rounded down.

Class Skills: The armorer's class skills (and the key ability for each skill) are Craft (electronic, mechanical, structural) (Int), Disable Device (Int), Drive (Dex), Intimidate (Cha), Knowledge (business, current events, history, physical sciences, tactics, technology) (Int), Repair (Int), Research (Int)

Skill Points at Each Level: 5+Int. modifier

Class Features

All of the following are features of the armorer advanced class.

Armor Affinity: The armorer has a feel for his creations, gaining the listed bonus to the armor check penalty of any suit of armor he designs.

Bug Hunter (armor): Any armor made by the armorer has its prototype modifier reduced by this amount. The armorer also gains the listed bonus to any Repair checks to fix a bug.

Man in the Iron Mask: At this level the armorer has mastered his craft. Any suit of armor made by the armorer gains a damage reduction to one type of attack (bludgeoning, piercing, slashing, ballistic) equal to the armorer's Intelligence modifier. Each suit of armor may only have one such resistance which must be decided when the armor is constructed and may not be changed.

Bonus Feats: At 3rd, 6th and 9th levels the armorer gains a bonus feat from the following list: Advanced Armor Design, Armory, Armor Proficiency (heavy), Armor Proficiency (medium), Armor Proficiency (powered), Builder, Great Fortitude, Improved Damage Threshold, Toughness. The armorer must meet the prerequisite of any feat selected.

Arsenal

The arsenal loves everything about guns. Designing them, building them and using them in combat. He gains a special ability to use guns of his own design in combat through his knowledge of their intricacies. The arsenal feels about his guns the way "normal" people feel about their kids.

Requirements

To qualify to become an arsenal, a character must fulfill the following criteria. (The fastest path to this class is through the Smart hero base class).

Table 1-2: The Arsenal

Level	Base Attack Bonus	Fort Save	Ref Save	Will Save	Special	Defense Bonus	Reputation Bonus
1st	+0	+1	+1	+0	Weapon Affinity +1	+1	+0
2nd	+1	+2	+2	+0	Bug Hunter (Firearms) +1	+1	+0
3rd	+2	+2	+2	+1	Bonus Feat	+2	+1
4th	+3	+2	+2	+1	Bug Hunter (Firearms) +2	+2	+1
5th	+3	+3	+3	+1	Weapon Affinity +2	+3	+1
6th	+4	+3	+3	+2	Bug Hunter (Firearms) +3; Bonus Feat	+3	+2
7th	+5	+4	+4	+2	Deadeye	+4	+2
8th	+6	+4	+4	+2	Bug Hunter (Firearms) +4	+4	+2
9th	+6	+4	+4	+3	Bonus Feat	+5	+3
10th	+7	+5	+5	+3	Bug Hunter (Firearms) +5; Weapon Affinity +3	+5	+3

Skills: Craft (mechanical) 6 ranks, Knowledge (physical sciences) 6 ranks, Knowledge (technology) 6 ranks
Feats: Personal Firearms Proficiency

Class Information

The following information pertains to the arsenal advanced class.

Hit Die: 1d8

Action Points: 6 plus one-half character level, rounded down.

Class Skills: The arsenal's class skills (and the key ability for each skill) are Computer Use (Int), Craft (chemical, electronic, mechanical, structural) (Int), Demolitions (Int), Disable Device (Int), Intimidate (Cha), Knowledge (business, civics, current Events, physical sciences, tactics, technology) (Int), Repair (Int), Research (Int), Spot (Wis)

Skill Points at Each Level: 5+Int. modifier

Class Features

All of the following are features of the arsenal advanced class.

Weapon Affinity: The arsenal has a feel for his creations, gaining the listed bonus to attack rolls with a gun he designed and built.

Bug Hunter (Firearms): Any firearm made by the arsenal has its prototype modifier reduced by this amount. The arsenal also gains the listed bonus to any Repair checks to fix a bug.

Deadeye: The arsenal develops a reputation for the quality of his weapon design and his marksmanship. He gains a bonus to all Craft (mechanical) checks equal to his Reputation modifier. When holding a weapon in his hand the arsenal also adds his Reputation modifier to all Intimidate skill checks.

Bonus Feats: At 3rd, 6th and 9th levels the arsenal gains a bonus feat from the following list: Builder, Dead Aim, Double Tap, Exotic Firearms Proficiency, Far Shot, Point Blank Shot, Quick Draw, Quick Reload, Weapon Finesse, Weapon Focus. The arsenal must meet the prerequisite of any feat selected.

Combat Engineer

Combat engineers are skilled at building structures quickly and efficiently. If you need a road or a wall in a hurry, especially if you need it in a combat zone, the combat engineer is your man. Since building things quickly involves getting rid of things in his way the combat engineer is also skilled at blowing things up. Unlike many other builders combat engineers are often concerned with getting things done *now* rather than making an artistic statement with his inventions. However when a combat engineer has the time no one is more willing and able to deliver a perfect road or bridge than he is.

Requirements

To qualify to become a combat engineer, a character must fulfill the following criteria. (The fastest path into this class is through the Smart hero base class).

Skills: Craft (chemical) 6 ranks, Craft (structural) 6 ranks, Demolitions 6 ranks

Feats: Builder

Class Information

The following information pertains to the combat engineer advanced class.

Hit Die: 1d8

Action Points: 6 plus one-half character level, rounded down.

Class Skills: The combat engineer's class skills (and the key ability for each skill) are Craft (chemical, electronic, mechanical, structural) (Int), Demolitions (Int), Disable Device (Int), Drive (Dex), Knowledge (current events, earth and life sciences, physical sciences, tactics, technology) (Int), Repair (Int), Research (Int), Survival (Wis), Swim (Str)

Skill Points at Each Level: 5+Int. modifier

Table 1-3: The Combat Engineer

Level	Base Attack Bonus	Fort Save	Ref Save	Will Save	Special	Defense Bonus	Reputation Bonus
1st	+0	+1	+1	+0	Hasty Construction +1d6	+1	+0
2nd	+1	+2	+2	+0	Bug Hunter (Structures and Explosives) +1	+1	+0
3rd	+2	+2	+2	+1	Bonus Feat	+2	+0
4th	+3	+2	+2	+1	Bug Hunter (Structures and Explosives) +2	+2	+0
5th	+3	+3	+3	+1	Hasty Construction +2d6	+3	+1
6th	+4	+3	+3	+2	Bug Hunter (Structures and Explosives) +3; Bonus Feat	+3	+1
7th	+5	+4	+4	+2	Brickhouse	+4	+1
8th	+6	+4	+4	+2	Bug Hunter (Structures and Explosives) +4	+4	+1
9th	+6	+4	+4	+3	Bonus Feat	+5	+2
10th	+7	+5	+5	+3	Bug Hunter (Structures and Explosives) +5; Hasty Construction +3d6	+5	+2

Class Features

All of the following are features of the combat engineer advanced class.

Hasty Construction: Combat engineers are accustomed to working under extreme time pressure. Whenever the combat engineer spends an action point or adds a bug to speed construction he gains this bonus to his Craft skill check.

Bug Hunter (Structures and Explosives): Any structure or explosive made by the combat engineer has its prototype modifier reduced by this amount. The combat engineer also gains the listed bonus to any Repair checks to fix a bug.

Brickhouse: When a combat engineer makes something he makes it to *last*. It might not be pretty but it will be solid. Add 20 plus the character's combat engineer level to the hit points of any structure he builds.

Bonus feats: At 3rd, 6th and 9th levels the combat engineer gains a bonus feat from the following list: Armor Proficiency (light), Armor Proficiency (medium), Endurance, Exotic Firearms Proficiency (grenade launcher), Personal Firearms Proficiency, Surface Vehicle Operation (heavy wheeled and tracked). The combat engineer must meet the prerequisite of any feat selected.

Gadgeteer

The gadgeteer treats science like a game, and technology like the ultimate toys. He loves the thrill of seeing if something can be done and if it breaks down five minutes later, well, he's already *done* that. The gadgeteer is on to the next challenge. Unlike other inventors he is not concerned with aesthetic considerations such as beauty or perfection. His inventions are not made to last and are often so riddled with bugs that later scientists can't even follow his work or reproduce his results. While this causes the scientific community to take a dim view of him, the gadgeteer is perfectly happy in the role of the scientific maverick. And if "real scientists" use words like "con man" or "charlatan" to describe him who cares. Certainly not the gadgeteer, he's often moving too fast to hear those stiffs in the lab coats anyway.

Requirements

To qualify to become a gadgeteer, a character must fulfill the following criteria. (The fastest path into this class is through the Smart hero base class).

Skills: Craft (any two) 6 ranks, Knowledge (any one) 6 ranks

Feats: Builder

Class Information

The following information pertains to the gadgeteer advanced class.

Hit Die: 1d8

Action Points: 6 plus one-half character level, rounded down.

Class Skills: The gadgeteer's class skills (and the key ability for each skill) are Bluff (Cha), Computer Use (Int), Craft (chemical, electronic, mechanical, structural) (Int), Disable Device (Int), Forgery (Int), Knowledge (physical sciences, technology) (Int), Repair (Int), Research (Int), Sleight of Hand (Int)

Skill Points at Each Level: 5+Int. modifier

Class Features

All of the following are features of the gadgeteer advanced class.

Mother of Invention: The gadgeteer can create complex devices seemingly from nothing but some duct tape and spare parts. For a Wealth cost in spare parts (remember the "at hand" equipment rules- gadgeteers always seem to have spare parts and duct tape falling our their pockets) of 1 per 25 points the gadgeteer may make Craft skill checks each *round* until his invention is complete. This invention is rife with errors, and the first time a prototype modifier is activated it will explode in a shower of parts and smoke.

At 1st level this ability may only be used to create inventions of 50 points or less. At 5th level it improves to 250 points and finally at 10th level 500 points.

Stone Knives and Bear Skins: The gadgeteer is able to build things on the cheap. He will dive into a junkyard pile and somehow come out with a powerful computer chip… *from 1954* and somehow make that work in his latest robot

Table 1-4: The Gadgeteer

Level	Base Attack Bonus	Fort Save	Ref Save	Will Save	Special	Defense Bonus	Reputation Bonus
1st	+0	+1	+1	+0	Mother of Invention 50 points	+1	+0
2nd	+1	+2	+2	+0	Stone Knives and Bear Skins +1	+1	+0
3rd	+2	+2	+2	+1	Bonus Feat	+2	+1
4th	+3	+2	+2	+1	Stone Knives and Bear Skins +2	+2	+1
5th	+3	+3	+3	+1	Mother of Invention 250 points	+3	+1
6th	+4	+3	+3	+2	Stone Knives and Bear Skins +3; Bonus Feat	+3	+2
7th	+5	+4	+4	+2	Technobabble	+4	+2
8th	+6	+4	+4	+2	Stone Knives and Bear Skins +4	+4	+2
9th	+6	+4	+4	+3	Bonus Feat	+5	+3
10th	+7	+5	+5	+3	Stone Knives and Bear Skins +5; Mother of Invention 500 points	+5	+3

control module. He gains the listed bonus on all Wealth checks when inventing or building items.

Technobabble: The gadgeteer is capable of spewing a stream of incredibly dense scientific terms when necessary. This technobabble is so dense and impenetrable, while at the same time sounding very impressive and official that it grants the gadgeteer a +1 bonus per gadgeteer level on Bluff and Forgery checks and also allows the gadgeteer to feint as a move action in combat.

Bonus Feats: At 3rd, 6th and 9th levels the gadgeteer gains a bonus feat from the following list: Armor Proficiency (light), Armor Proficiency (medium), Combat Expertise, Educated, Handyman, Personal Firearms Proficiency, Renown, Windfall. The gadgeteer must meet the prerequisite of any feat selected.

Grease Monkey

A lot of people love to work on cars. But you have to see how your handy work plays out under race conditions. You want to feel the tires grab at the road as you take a hard turn and you want to win pink slips in the old hunk of junk you personally restored.

Requirements

To qualify to become a grease monkey, a character must fulfill the following criteria. (The fastest path into this class is through the Tough hero base class).

Skills: Craft (mechanical) 6 ranks, Drive 6 ranks, Knowledge (physical sciences) 3 ranks

Feats: Combat Driving

Class Information

The following information pertains to the grease monkey advanced class.

Hit Die: 1d8

Action Points: 6 plus one-half character level, rounded down.

Class Skills: The grease monkey's class skills (and the key ability for each skill) are Craft (electronic, mechanical, structural) (Int), Disable Device (Int), Drive (Dex), Intimidate (Cha), Knowledge (business, current events, physical sciences, popular culture, rechnology) (Int), Repair (Int), Research (Int)

Skill Points at Each Level: 5+Int. modifier

Class Features

All of the following are features of the grease monkey advanced class.

Vehicle Affinity: The grease monkey has a feel for his creations, gaining the listed bonus to Drive skill checks with a vehicle he has built. The grease monkey also adds the listed bonus to his vehicle's defense if he takes that vehicle into combat.

Bug Hunter (Vehicles): Any vehicle made by the grease monkey has its prototype modifier reduced by this amount. The grease monkey also gains the listed bonus to any Repair checks to fix a bug.

Juiced: At this level the grease monkey has achieved a mastery of high-performance engine design most can only dream of. On a Craft (mechanical) check (generating 100 Invention Points) and a Wealth check (DC 10) the grease monkey increases the top speed of any vehicle he juices by 10' per grease monkey level.

Bonus Feats: At 3rd, 6th and 9th levels the grease monkey gains a bonus feat from the following list: Armor Proficiency (light), Armor Proficiency (medium), Builder, Drive-by Attack, Exotic Firearms Proficiency (tank/APC weapons), Force Stop, Gearhead, Handyman, Mass Production, Surface Vehicle Operation, Vehicle Dodge. The grease monkey must meet the prerequisite of any feat selected.

Inventor

The inventor is not as good at combat as the other invention classes detailed in Blood and Circuits. He is, however, the best inventor and has the highest number of skill points.

Requirements

To qualify to become an inventor, a character must fulfill the following criteria. (The fastest path into this class is through the Smart hero base class).

Table 1-5: The Grease Monkey

Level	Base Attack Bonus	Fort Save	Ref Save	Will Save	Special	Defense Bonus	Reputation Bonus
1st	+0	+0	+2	+0	Vehicle Affinity +1	+1	+0
2nd	+1	+1	+3	+1	Bug Hunter (Vehicles) +1	+1	+0
3rd	+2	+1	+3	+1	Bonus Feat	+2	+0
4th	+3	+1	+4	+1	Bug Hunter (Vehicles) +2	+2	+0
5th	+3	+2	+4	+2	Vehicle Affinity +2	+3	+1
6th	+4	+2	+5	+2	Bug Hunter (Vehicles); Bonus Feat	+3	+1
7th	+5	+2	+5	+2	Juiced	+4	+1
8th	+6	+3	+6	+3	Bug Hunter (Vehicles) +4	+4	+1
9th	+6	+3	+6	+3	Bonus Feat	+5	+2
10th	+7	+3	+7	+3	Vehicle Affinity +3; Bug Hunter (Vehicles) +5	+5	+2

Skills: Craft (any one) 6 ranks, Knowledge (physical sciences) 6 Ranks, Knowledge (technology) 6 ranks

Feats: Educated

Class Information

The following information pertains to the inventor advanced class.

Hit Die: 1d8

Action Points: 6 plus one-half character level, rounded down.

Class Skills: The inventor's class skills (and the key ability for each skill) are Computer Use (Int), Craft (chemical, electronic, mechanical, structural) (Int), Demolitions (Int), Disable Device (Int), Drive (Dex), Knowledge (business, current events, earth and life sciences, physical sciences, tactics, technology) (Int), Navigate (Int), Pilot (Dex), Repair (Int), Research (Int)

Skill Points at Each Level: 9+Int. modifier

Class Features
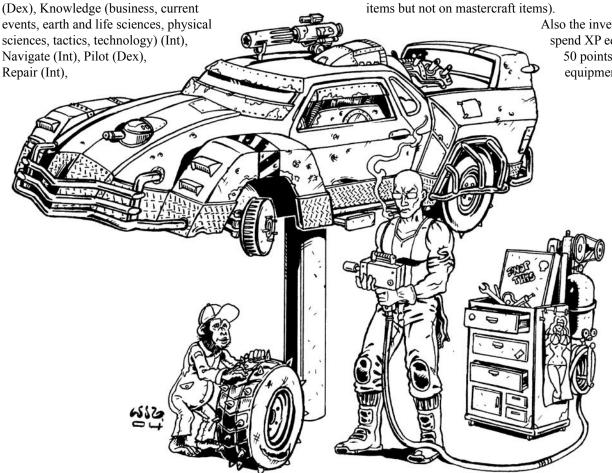
All of the following are features of the inventor advanced class.

Magnum Opus: The inventor pours his heart and soul into his creations. When an inventor creates an item he may make it a mastercraft item, granting the final item a bonus up to that listed on the inventor class table.

This item's Invention Point cost is increased by 50 points per +1 equipment bonus and the inventor may not add to the object's prototype modifier in order to rush the creation or make it more cheaply (the inventor may do this on normal items but not on mastercraft items).

Also the inventor must spend XP equal to 50 points per +1 equipment bonus.

Table 1-6: The Inventor

Level	Base Attack Bonus	Fort Save	Ref Save	Will Save	Special	Defense Bonus	Reputation Bonus
1st	+0	+1	+1	+2	Magnum Opus +1	+0	+1
2nd	+1	+2	+2	+3	Bug Hunter (all) +1	+1	+1
3rd	+1	+2	+2	+3	Bonus Feat	+1	+1
4th	+2	+2	+2	+4	Bug Hunter (all) +2	+1	+2
5th	+2	+3	+3	+4	Magnum Opus +2	+2	+2
6th	+3	+3	+3	+5	Bug Hunter (all) +2; Bonus Feat	+2	+2
7th	+3	+4	+4	+5	Master Inventor	+2	+3
8th	+4	+4	+4	+6	Bug Hunter (all) +4	+3	+3
9th	+4	+4	+4	+6	Bonus Feat	+3	+3
10th	+5	+5	+5	+7	Bug Hunter (all) +5; Magnum Opus +3	+3	+4

Bug Hunter (all): Any item made by the inventor has its prototype modifier reduced by this amount. The inventor also gains the listed bonus to any Repair checks to fix a bug.

Master Inventor: At this level the inventor gains a bonus to all Craft skill checks equal to his Reputation bonus.

Bonus Feat: At 3rd, 6th and 9th levels the inventor gains a bonus feat from the following list: Advanced Armor Design, Advanced Weapon Design, Armor Proficiency (light), Builder, Gearhead, Perfectionist, Personal Firearms Proficiency, Renown, Windfall. The inventor must meet the prerequisite of any feat selected.

New Skills

This chapter presents some new technical and military related skills and new uses for existing skills. Many of these will be familiar to players of Blood and Guts but when appropriate, they have been reproduced here for convenience.

Craft (Structural) (Int)

Trained Only

Fortifications (New Use): Characters can make fortifications to aid them in combat, from the simple (yet effective) foxhole, to the bunkers described in the Modern Core Rulebook. Hasty Fortifications can be constructed more quickly. For each five points by which the character's skill check exceeds the DC, reduce the construction time by one hour. Vehicles in the new vehicles section can reduce many of these times to minutes.

Name	DC	Time	Effect
Dug In (Small Vehicle)	5	24 hrs.	¼ Cover
Deep	5	36 hrs.	½ Cover
Dug In (Med. Vehicle)	5	36 hrs.	¼ Cover
Deep	5	48 hrs.	½ Cover
Dug In (Lg. Vehicle)	5	48 hrs.	¼ Cover
Deep	5	72 hrs.	½ Cover
Foxhole (shallow)	5	8 hrs. per man	¼ Cover
Foxhole (deep)	5	12 hrs. per man	½ Cover

Anti-Mobility Construction: Fortifications are also useful to deny an enemy the use of its vehicles in a certain area or from a certain direction.

Name	DC	Time	Effect
Road Break (shallow)	5	12 hrs per 4 feet	Ditch (see vehicle rules for gaps)
Road Break (deep)	10	18 hrs per 4 feet	Culvert (see vehicle rules for gaps)

Mobility Construction: The opposite of anti-mobility, allows you to get where you're going faster, land aircraft safely, and cross raging rivers. Again the right equipment (such as a Bridgelayer) can reduce construction times substantially.

Name	DC	Time	Effect
Improvised Road	15	12/hrs per mile	Wheeled vehicles move ¾ speed.
Improvised Runway	15	8 hrs.	Aircraft may land (as opposed to crash)
Short Runway	18	12 hrs.	Aircraft may land more safely
Runway	20	24 hrs.	Aircraft may land more safely
Pontoon Bridge (small river)	15	12 hrs.	Vehicles may cross at ½ speed.
Pontoon Bridge (med. river)	15	18 hrs.	Vehicles may cross at ½ speed.
Pontoon Bridge (lg. river)	15	24 hrs.	Vehicles may cross at ½ speed.
Sectional Bridge (small river)	20	18 hrs.	Vehicles may cross at full speed.
Sectional Bridge (med. river)	20	24 hrs.	Vehicles may cross at full speed.
Sectional Bridge (lg. river)	20	36 hrs.	Vehicles may cross at full speed.

Listen (Wis)

The following new use is *Trained Only*.

Sonar Operation (New Use): Sonar operators use what is known as passive sonar to detect enemy vessels on most occasions. Passive sonar gives the best chance of detecting your enemy without aiding his efforts to detect you. Sonar

operators have finely tuned senses of hearing capable of discerning minute differences in pressure and motion in the waters around their ship. These natural capabilities are backed up by computers sophisticated enough to identify submarines by name by the sound they make when moving through the water. This skill is opposed by the Drive skill of an enemy submarine in submarine warfare. See the new combat rules section on submarine warfare for more information.

Active Sonar grants an operator a +10 to his skill check, but grants the same bonus to any enemy in the area to detect *him*. Thus, this method of Sonar detection is often only used by surface vessels and aircraft that have a clear advantage over any submarine in terms of weaponry and speed.

Characters without the Sonar Operation feat take a –4 penalty when making Listen checks for Sonar Operation.

Pilot (Dex)

Trained Only

Under most normal circumstances (with characters being able to take 10 on piloting skill checks), there is no need to make a skill check to land an aircraft. However, pilots conducting special operations rarely land at well lit airports during the day.

Landing in Adverse Conditions:

Sample Actions	DC
Carrier Deck	20
Improvised Runway	20
Short Runway	15
Normal Runway	10
Mildly Adverse Weather (Thunderstorm)	+5
Adverse Weather (High Winds, Fog, Extreme Cold)	+10
Seriously Adverse Weather (Hurricane, Blizzard)	+15
Mildly Crowded Airspace (Medium Airport)	+5
Crowded Airspace (Large Airport, Medium Airport at Peak)	+10

Computer Use (Int)

The following new uses are *Trained Only.*

Send Transmission (New Use): This skill represents familiarity with communication systems, from backpack sized satellite radios to the satellites themselves.

Unless there is severe weather, the character's transmitter is damaged, or an enemy is actively jamming his signal, there is usually no need to make a check. If the character's transmitter is damaged, then the DC of her skill check is 10 + the amount of damage the system has suffered. If there is a storm, the DC would be anywhere from 15 for an extremely heavy thunderstorm to 30 during hurricane conditions. If the PC is attempting to overcome enemy Electronic Warfare, then the DC is usually a skill vs. skill contest.

If the character rolls the DC needed exactly, then a partial, garbled message gets through.

Jamming (New Use): Most of the time, this skill is not rolled against a static DC, but rather rolled as a skill vs. skill contest against the Computer Use of the character's opponent. The character engaging in active jamming rolls her skill check first, which sets the DC for her opponent's Computer Use skill to successfully get a signal through.

Transmission Interception (New Use): If a signal is not scrambled (meaning it is a general broadcast on an unsecured frequency) then intercepting it requires a Computer Use check (DC 10). If the signal is scrambled (see below) it requires a successful skill vs. skill contest against your opponents Computer Use roll.

Transmission Triangulation (New Use): Once a transmission has been intercepted, a character with this skill may make another skill check (DC 5 higher than the check required to intercept a signal) to determine where that signal was broadcast. This grants a +5 bonus to any active sensor scan to detect the target vessel.

Scramble/Unscramble Transmission (New Use): Computer use can be used to scramble a transmission. This is done with an opposed Computer Use check between the individual sending the message and anyone attempting to intercept or unscramble it.

Retry: The character may retry the skill whenever conditions improve. If the storm lessens, or if her transmitter is repaired (even partially), the character may try again. If the character is trying to pierce enemy jamming operations, she may try every round. In the case of documents coded with Cryptography, the character may try again, but disposing of the original becomes a serious security issue in such a case.

Spot (Wis)

The following new uses are *Trained Only.*

Radar Operation (New Use): Even with modern advanced radar systems, the eye of the operator is still key in determining the difference between a large cloud bank and a squadron of incoming fighters. A successful spot check will allow the operator to distinguish natural phenomena from aircraft at a range of several miles. Characters without the Radar Operation feat take a –4 penalty to Spot checks for Radar Operation.

Air Traffic Control (New Use): When making spot checks for radar operation you can assist a craft in taking off or landing. The base DC is 15 and grants a +2 circumstance bonus to pilot checks. For every 5 points by which your roll exceeds this DC an additional +1 bonus is granted. This use of the spot skill may not be used untrained."

Reconnaissance (New Use): Knowing where your enemy is, in what numbers, how he is defended, and where he is going are crucial to formation of a plan for attack or defense. Besides providing the information above, a successful reconnaissance skill check will grant the following bonus to Knowledge (tactics) if brought the attention of a friendly force within 24 hours.

Check	Bonus
15	+2
20	+3
25	+4

Survival (Wis)

The following new use is *Trained Only*

Signaling (New Use): This skill also covers non-electronic methods of communication, such as Semaphore, and can allow a character to perform the Air Traffic Control skill without a radio by using lights, flares, flags, and other improvised methods. Characters without the Signaling feat take a –4 penalty to Survival checks for Signaling.

Tumble (Dex)

Trained Only

Paradrop (New Use): Airborne insertions are a powerful military tool for inserting soldiers behind enemy lines for scouting, surprise raids, and special operations. In modern warfare, heavily fortified positions can be bypassed, encircled, and defeated with far less casualties than were taken in past conflicts. This skill allows a character to land precisely where she wishes to, and also allows parachuting under less than ideal conditions (from a very fast-moving craft, a low-flying craft and so forth). This skill also covers preparing equipment to be dropped. Characters without the Jump School feat take a –4 on any Tumble skill check made during a paradrop attempt (both the skill check to land on target and any skill check required to avoid damage).

Failing this check means the character lands 100 yards off target for every two points by which his roll missed the DC. Failing a check by more than 5 means the character has landed somewhere dangerous (depending on the situation, a dangerous landing could be in proximity to enemy soldiers, power lines, dense foliage, etc).

Failing the check to safely land in dense foliage such as a forest means the character has become fouled in the brush 10-100 feet above the ground. Getting down usually involves climbing or simply cutting yourself free and falling the remaining distance.

Failing the check from a high speed or low altitude insertion results in 1-4 points of damage per 2 points by which the character missed the DC (in addition to possibly landing off target, and landing somewhere dangerous). The character may attempt either a Reflex save (DC 20), or a Tumble check (DC 15) to reduce this damage by half.

Forces on the ground need to roll a Spot check (DC 10) to detect incoming paratroopers 1-6 rounds (50-300 ft) before landing. Paratroopers in the air are extremely vulnerable to enemy fire, being treated as flat-footed both while in the air, and for 1-4 rounds after they land (while the soldiers get free of their heavy parachute riggings). A successful Paradrop skill (DC 15) will allow a character to get clear of

his riggings in the minimum time (1 round).

For these reasons, soldiers will only be dropped into a hostile landing zone when absolutely necessary. Often Special Operations forces will be sent in first, to make sure an area is secure (neutralizing any enemy forces encountered) before more conventional troops are paradropped in.

The following uses of the Tumble skill may not be used at all by characters without the Jump School feat:

HALO (New Use): For special operations, the HALO, or High Altitude Low Opening method of deployment is considered the ideal. Troops are dropped from extreme altitude, making the presence of aircraft harder to detect. The soldiers so deployed then wait until they are extremely low before deploying their parachutes. HALO landings are only spotted by forces on the ground on a Spot check of 20 or higher, and if a HALO drop is spotted, forces on the ground only have 1-2 rounds during which to attack the incoming Paratroopers.

LALO (New Use): LALO, or Low Altitude Low Opening method of deployment is also very popular, used when aircraft must come in under the radar of a potentially hostile group, or to avoid a diplomatic incident. LALO insertions are risky, as the soldiers are pulled from the craft, their chute opens, and they hit the ground, all in under a minute. On a LALO jump, characters receive 2d6 points of nonlethal damage from the stress and impacts of the jump (if they fail their paradrop skill check the damage inflicted above is added to this nonlethal damage as well).

Sample Actions	DC
Land within 100 feet of target	15
Land within 100 yards of target	10
Land within one mile of target	5
Paradrop Safely through dense foliage	25
HALO	+5
LALO	+5
Paradrop equipment	20
Clear riggings in 1 round	15

Special: Characters with 5 or more ranks in Jump receive a +2 Synergy bonus on Paradrop checks.

Feats

Like the new skills presented in this book these will find the most favor with Smart Heroes. However some will be desirable to characters of every profession.

Advanced Armor Design

You are able to design and build futuristic armors.

Prerequisite: Craft (mechanical) 10 ranks, Knowledge (physical sciences) 8 ranks, Knowledge (technology) 5 ranks

Effect: You are able to add flight, exoskeletons and weapons to suits of armor you design (any armor with a PL

of 6 or higher).

Normal: Characters without this feat may not design futuristic armors.

Advanced Electronic Design

You are able to design and build futuristic electronics.

Prerequisite: Craft (electronic) 10 ranks, Knowledge (physical sciences) 8 ranks, Knowledge (technology) 5 ranks

Effect: You are able to build advanced electronics (any weapon with a PL of 6 or higher).

Normal: Characters without this feat may not design futuristic electronics.

Advanced Weapon Design

You are able to design and build futuristic weapons.

Prerequisite: Craft (mechanical) 10 ranks, Knowledge (physical sciences) 8 ranks, Knowledge (technology) 5 ranks

Effect: You are able to build advanced weapons (any weapon with a PL of 6 or higher).

Normal: Characters without this feat may not design energy weapons.

Advanced Vehicle Design

You are able to design and build futuristic vehicles.

Prerequisite: Craft (mechanical) 10 ranks, Knowledge (physical sciences) 8 ranks, Knowledge (technology) 5 ranks

Effect: You are able to build futuristic vehicles (any weapon with a PL of 6 or higher).

Normal: Characters without this feat may not design futuristic vehicles.

Aircraft Operation

Select a class of aircraft (heavy aircraft, helicopters, jet fighters, or spacecraft). The character is proficient at operating that class of aircraft.

The heavy aircraft class includes jumbo passenger airplanes, large cargo planes, heavy bombers, and any other aircraft with three or more engines. Helicopters include transport and combat helicopters of all types. Jet fighters include military fighter and ground attack jets. Spacecraft are vehicles such as the space shuttle and the lunar lander.

Prerequisite: Pilot 4 ranks.

Benefit: When operating an aircraft of the selected type, you take no penalty on Pilot checks made when operating the aircraft, and you also apply your full class bonus to Defense to the aircraft's Defense.

Normal: Characters without this feat take a –4 penalty on Pilot checks made to operate an aircraft that falls in any of these classes, and on attacks made with aircraft weapons and you apply only one-half your class bonus to Defense (rounded down) to the aircraft's Defense. There is no penalty when the character operates a general-purpose aircraft.

Special: The character can gain this feat multiple times.

Each time the character takes the feat, the character selects a different class of aircraft.

Armor Proficiency (Powered)

You are skilled in the use of fantastic, powered armor.

Prerequisite: Armor Proficiency (light), Armor Proficiency (medium)

Effect: When you wear a suit of powered armor with which you are proficient, you get to add the armor's entire equipment bonus to your defense and the entire Strength bonus to your Strength.

Bonus: Soldiers maybe select this feat as a bonus feat.

Armory

You have access to sophisticated armor.

Effect: You gain a +5 bonus to Wealth checks to buy armor. Either you have a backer providing you with equipment or you have financial support to purchase the armor.

Special: This feat may be taken multiple times. Its effects stack.

Bonus: This feat is a bonus feat for Charismatic heroes.

Arsenal

You have access to a large variety of weapons.

Effect: You gain a +5 bonus to Wealth checks made to buy weapons. Either you have a backer providing you with equipment or you have financial support to purchase the weapons.

Special: This feat may be taken multiple times. Its effects stack.

Bonus: This feat is a bonus feat for Charismatic heroes.

Called Shot

You excel with one ranged weapon.

Prerequisite: Weapon Focus (ranged weapon), Sharpshooter, BAB 7+

Effect: As a full round action, you may make a called shot, taking a –2 to hit for a +1d6 damage bonus. This feat may be taken multiple times, its effects stack (so a character that has this feat twice would be able to take –2 to hit for +1d6 damage, or –4 to hit for +2d6 damage). This additional damage is not multiplied on a critical.

Combat Driving

You are highly skilled at using normal vehicles in combat.

Prerequisite: Drive 4 ranks

Effect: When driving a normal wheeled vehicle you add your class Defense bonus and Dexterity modifier to the defense of that vehicle.

Normal: A character without this feat adds no bonus to the Defense of a car that comes under attack.

Bonus: This feat is a bonus feat for Fast Heroes and Daredevils.

Cover Fire

You are highly skilled at providing cover fire.

Prerequisites: Personal Firearms, Teamwork

Effect: You gain a 50% increase in cover fire bonuses (+3 or Dexterity modifier x1.5 whichever is higher).

Bonus: This feat is a bonus feat for Dedicated heroes.

Cutting Edge

You have access to next-generation technology.

Prerequisite: GM permission

Effect: You make wealth checks to make items as if you were from a society with a Progress Level one higher than the current one.

Normal: Each PL higher than 5 raises the price of an item by +5.

Special: This feat may only be selected with the GM's permission. Most campaigns will allow this feat to be selected once. In superheroic or campaigns featuring time travel or weird science the GM may allow characters to select this feat multiple times, in which case its effects stack (so selecting this feat twice would allow a character from a PL 5 society to build objects as if he were from a PL 7 society).

Bonus: This feat is a bonus feat for Smart heroes.

Electronic Warfare

You are an expert in the most sophisticated modern warfare techniques.

Effect: You gain a +3 bonus when using the following uses of the Computer Use skill: Jamming, Transmission Interception, Transmission Triangulation, or Scrambling/Unscrambling Transmission.

Bonus: This feat is a bonus feat for Smart heroes.

Evasive Maneuvers

You are a master of aerial acrobatics which make any craft you pilot a hard target to latch onto in a dogfight.

Prerequisite: Pilot 5 ranks, Aircraft Operation (any type)

Effect: When piloting a craft you have the Aircraft Operation feat for you may take a –1 penalty to attack rolls in return for raising the Defense of the craft you are piloting by +1.

Special: This feat may not be used by fighters in a formation (those benefiting from the Formation Flying or Wingman feats- they are too close together). However on a free action one or more the craft may break formation in order to use this feat.

Bonus: This feat is a bonus feat for Fast Heroes and Daredevils.

Fighter Escort

You are trained to protect larger, more valuable craft.

Prerequisites: Teamwork

Description: As their ability to protect each other in air combat became apparent, strategists also recognized the Fighter's ability to protect larger, more valuable craft. Although a vital necessity at times due to the strategic value of larger ships, flying escort with a larger ship is one of the most dangerous jobs a fighter pilot can have.

Effect: A craft Large or larger protected by a fighter escort gains a +1 Defense bonus for each fighter protecting him. If the fighters flying escort are themselves are the target of an attack their pilots only apply ½ their class bonus to the Defense of their craft.

Fixed Wing Vehicle Weapons

Exotic Firearms Proficiency

You are proficient in Fixed-Wing mounted vehicle weapons. This feat replaces the more generic Exotic Firearms Proficiency- Cannon feat.

Prerequisite: Aircraft Operation (Jet Fighters)

Effect: You make attack rolls with the weapon normally.

Normal: A character that uses a weapon without being proficient takes a –4 penalty to hit.

Formation Flying

You piloting skills allow you to fly in close formation, protecting your fellow pilots.

Prerequisites: Teamwork

Description: As long as aircraft have been shooting each other down pilots have known the advantages of flying in formation. One craft covers for the other, and a character's wingman is usually the person he trusts most in the world.

Effect: All Fighters on the same side of a battle who are flying in formation with this feat gain +2 Defense in vehicle combat by protecting one another. This feat also grants a +2 bonus on Clear Your Six stunt piloting checks.

Handyman

You are skilled at building and fixing items.

Effect: You gain a +2 bonus to Repair checks and one Craft skill.

Helicopter Vehicle Weapons

Exotic Firearms Proficiency

You are proficient in Helicopter mounted vehicle weapons. This feat replaces the more generic Exotic Firearms Proficiency- Cannon feat.

Prerequisite: Aircraft Operation (Helicopters)

Effect: You make attack rolls with the weapon normally.

Normal: A character that uses a weapon without being proficient takes a –4 penalty to hit.

Table 1-7: Leadership (Henchman)

Score Leadership	Number of Followers by Level					
	1st	2nd	3rd	4th	5th	6th
1 or less	-	-	-	-	-	-
2	-	-	-	-	-	-
3	-	-	-	-	-	-
4	-	-	-	-	-	-
5	-	-	-	-	-	-
6	-	-	-	-	-	-
7	-	-	-	-	-	-
8	-	-	-	-	-	-
9	-	-	-	-	-	-
10	5	-	-	-	-	-
11	6	-	-	-	-	-
12	8	-	-	-	-	-
13	10	1	-	-	-	-
14	15	1	-	-	-	-
15	20	2	1	-	-	-
16	25	2	1	-	-	-
17	30	3	1	1	-	-
18	35	3	1	1	-	-
19	40	4	2	1	1	-
20	50	5	3	2	1	-
21	60	6	3	2	1	1
22	75	7	4	2	2	1
23	90	9	5	3	2	1
24	110	11	6	3	2	1
25+	135	13	7	4	2	2

Table 1-8: Leadership Modifiers

General Leadership Modifiers	
The Leader Has a Reputation of	Leadership Modifier
Great Success	+2
Great Failure	-2
Each +2 Reputation	+1

Follower-only Leadership Modifiers	
The Leader:	Leadership Modifier
Has a base of operations	+2
Has a Headquarters	+4
Has the Home Turf feat	+1
Moves around a lot	-1
Caused the death of other followers	-1

Henchmen

You have a group of followers.

Prerequisite: You must be at least 3rd level.

Benefit: You have a group of followers who assist you out of loyalty, serve you for pay, or obey you from fear.

Leadership Score: A character's Leadership score equals his level plus any Charisma modifier. In order to take into account negative Charisma modifiers, Table 1-7: allows for very low Leadership scores, but the character must still be 6th level or higher in order to gain the Leadership feat and thus attract a cohort. Outside factors can affect a character's Leadership score, as detailed in Table 1-8: Leadership Modifiers.

Number of Followers by Level: You can lead up to the indicated number of characters of each level.

Followers: A leader attracts followers who share at least one of the character's Allegiances. As the leader's Leadership rises, he can attract more followers. If his Leadership goes down, followers may desert.

Replacing Followers: If a leader loses a cohort or followers, he can generally replace them, according to his current Leadership score. It takes time (1d4 months) to recruit replacements. If the leader is to blame for the deaths of followers, it takes extra time to replace them, up to a full year. Note that the leader also picks up a reputation of failure, which decreases his Leadership score.

Bonus: Charismatic heroes may take this feat as a bonus feat.

Jump School

You have been given training in advanced parachute techniques including HALO and LALO openings (although the military term "Jump School" is used for this feat a character who was a highly skilled sport jumper or "extreme athlete" could possess this feat as well).

Prerequisite: Tumble 4 ranks

Effect: You suffer no penalty to Tumble skill checks made during a paradrop. In addition you may make HALO and LALO paradrops (see the Tumble skill entry for more information on this new skill use).

Bonus: This feat is a bonus feat for Fast Heroes and Daredevils.

Mass Production

You are able to reduce costs on items you make in bulk because of an attention to detail and knowledge of mass production techniques.

Prerequisite: Character Level 10, Workforce, Knowledge (business) 5 ranks

Effect: Each time you make a duplicate of an item you gain a +2 bonus on any craft check to make the item as well as a +2 bonus on the wealth check to pay for the item. Each of these bonuses stacks each time you make the item (so if you make a 3rd item you gain +4 on craft and wealth checks to make the item). If you make a duplicate of an item containing "bugs" you haven't yet found and fixed then the duplicate has those bugs as well.

Bonus: This feat is a bonus feat for Charismatic heroes.

Mastercrafter

You are adept at creating mastercraft electronic and mechanical devices (including tools, vehicles, weapons, robot manipulators, and armor).

Prerequisites: Craft (electrical) 8 ranks, Craft (mechanical) 8 ranks.

Benefit: When successfully completed, a mastercraft electronic or mechanical object provides an equipment bonus on skill checks made to use the object (in the case of

mastercraft vehicles, this includes Drive or Pilot checks). A mastercraft weapon provides a bonus on attack or damage rolls (your choice). A mastercraft suit of armor improves the armor's equipment bonus to Defense. In each case, the bonus can be +1, +2, or +3, and no single object can have more than one mastercraft feature. (For instance, you cannot build a mastercraft weapon that gains a bonus on attack rolls and damage rolls.)

On average, it takes twice as long to build a mastercraft object as it does to build an ordinary object of the same type. The cost to build a mastercraft object is equal to the purchase DC for the object (or its components) + the bonus provided by the mastercraft feature (+1, +2, or +3).

In addition to the Wealth check, you must also pay a cost in experience points equal to 250 × the bonus provided by the mastercraft feature. The experience points must be paid before making the Craft check. If the expenditure of these experience points would drop you below the minimum needed for your current level, then the experience points can't be paid and you can't make the mastercraft object until you have sufficient experience points to remain at your current level after the expenditure is made.

Apply the following modifiers to the Craft check DC for mastercraft items:

Mastercraft Feature	DC Modifier
Mastercraft (+1)	+3
Mastercraft (+2)	+5
Mastercraft (+3)	+10

You can add the mastercraft feature to an existing ordinary object or a lower-grade mastercraft object by making a Wealth check and then making the Craft check as though you were constructing the object from scratch.

Perfectionist

Your dedication to your craft is remarkable, causing you to generate items with fewer bugs. However your care causes you to take your time, choosing to do your project right rather than rush it.

Prerequisite: Wisdom 13+

Effect: Any item you create will have its prototype modifier reduced by 3 upon completion.

Special: You may not add to an item's prototype modifier to rush it to completion (see the equipment design rules for more information).

Bonus: This feat is a bonus feat for Dedicated heroes.

Radar Operation

You are skilled at operating Radar Systems.

Effect: You make Spot skill checks normally to perform Radar Operation.

Normal: Characters without this feat suffer a –4 penalty to Spot skill checks to perform Radar Operation.

Bonus: This feat is a bonus feat for Smart heroes.

Ricochet

You can bounce your ranged attacks to catch an opponent off guard.

Prerequisites: Weapon Focus (Aerodynamic weapon), Sharpshooter, BAB 7+

Effect: When making a ranged attack with an *Aerodynamic* weapon you may bounce your attack off a surface to strike your target from an unexpected direction as a full-round action. This attack ignores any modifier to your target's Defense from Cover. If you spend an action point when making a ricochet attack, your target is also flat-footed against the attack.

If you exceed the required attack roll needed to hit your target by 5 or more your weapon will return to you after your attack.

Ricochet, Improved

You can bounce your weapon off multiple opponents before your weapon returns to you.

Prerequisites: Ricochet, BAB 9+

Effect: As Ricochet except you may cause your weapon to bounce to a new target (like setting up a complicated pool shot). If you exceed the required attack roll needed to hit your target by 5 or more you may make an attack against a second target. This second attack must be directed at a target within 10 feet of the original target and suffers a -2 penalty to hit. If that attack succeeds by 5 or more you may then make an attack against an additional target within 10 feet at -4 to hit. No opponent may be targeted by an attack from this feat more than once per round. If an attack roll succeeds by 5 or more you may have your weapon return to your hand rather than choose a new target. Even if an action point is spent in the making of this attack only one target per round will be rendered flat-footed by this feat.

Sharpshooter

You are an expert shot with one weapon.

Prerequisite: Base Attack Bonus 5+, Weapon Focus (one ranged weapon).

Effect: You gain +1 to hit, and +2 damage with the chosen weapon. This bonus stacks with any bonus gained from the Weapon Focus feat or the Weapon Specialization Soldier Advanced Class ability. This feat may be taken more than once. Its effects do not stack. Each time you take this feat it applies to a different weapon for which you have already taken Weapon Focus.

Signaling

You are skilled at performing non-electronic methods of communication.

Effect: You make Survival skill checks normally to perform Signaling.

Normal: Characters without this feat suffer a –4 penalty

to Survival skill checks to perform Signaling.

Bonus: This feat is a bonus feat for Dedicated heroes.

Sonar Operation

You are skilled at operating sonar equipment.

Effect: You make Listen skill checks normally to perform Sonar Operation.

Normal: Characters without this feat suffer a –4 penalty to Listen skill checks to perform Sonar Operation.

Bonus: This feat is a bonus feat for Dedicated heroes.

Surface Vehicle Operation

Select a class of surface vehicle (wheeled, heavy wheeled, powerboat, sailboat, ship, or tracked). The character is proficient at operating that class of vehicle.

The heavy wheeled class includes all kinds of semi-trucks and tractor-trailers, as well as wheeled construction vehicles (such as earth movers) and wheeled armored vehicles (such as some armored personnel carriers). Powerboats are engine-powered water vessels designed for operation by a single person and usually no more than 100 feet in length. Sailboats are wind-powered water vessels. Ships are large, multicrewed water vessels. Tracked vehicles include bulldozers and tanks and other military vehicles.

Prerequisite: Drive 4 ranks.

Benefit: When operating a vehicle of the selected type, you take no penalty on Drive checks made when operating the vehicle, and you also apply your full class bonus to Defense to the vehicle's Defense.

Normal: Without this feat, you take a –4 nonproficient penalty on Drive checks made to operate a vehicle, and you apply only one-half your class bonus to Defense (rounded down) to the vehicle's Defense.

Special: A character can gain this feat as many as five times. Each time the character takes the feat, he or she selects a different class of surface vehicle.

Teamwork- Specific Group

You have trained with a specific group and gain bonuses when working with members of that group.

Prerequisite: Allegiance (Specific Team)

Effect: Whenever you are working with someone with the Teamwork feat for the same group (this could be as small as one other person and as large a group as a branch of the armed forces), you gain +2 to attack and skill checks.

Bonus: This feat is a bonus feat for Dedicated heroes.

Tank/Apc Weapons

Exotic Firearms Proficiency

You are proficient with large vehicle-mounted weapons found on tanks and APCs. This feat replaces the more generic Exotic Firearms Proficiency- Cannon feat.

Prerequisite: Drive 5 Ranks, Surface Vehicle Operation (Tracked)

Effect: You make attack rolls with the weapon normally.

Normal: A character that uses a weapon without being proficient takes a –4 penalty to hit.

Wingman

You are a pilot's best friend, capable of watching his back and making sure he makes it home from his mission.

Prerequisite: Teamwork, Formation Flying

Description: You are a most valuable commodity: an expert wingman.

Effect: You grant your partner a +4 Def bonus in vehicle combat. If a missile hits the plane you are defending, you may attempt to shoot it down as an attack of opportunity. This feat grants a +2 bonus on Clear Your Six pilot checks, which stacks with the bonus granted by Formation Flying (for a total bonus of +4).

Workforce

Your henchmen are skilled workers able to aid you in building devices.

Prerequisite: Character level 5, Int 13+, Henchmen

Effect: All of your followers gain a feat from the following list for free: Builder, Cautious, Educated, Gearhead, Medical Expert, Studious, Surgery. Also all of your followers have a minimum Intelligence of 12.

New Combat Modifiers

Like the new skills in this book these new combat modifiers first saw life in Blood and Guts. However in so far as they add to and clarify weapons and vehicle rules some have been reproduced here.

Air Support

If land forces have aircraft actively supporting them in an engagement, all soldiers on that side of the battle gain +2 to hit and defense. Note that if both sides of a battle have air support, both sides gain this bonus, effectively negating it.

Air Superiority: If one side of a battle *completely* controls the skies, then this bonus rises to +3 to hit and defense.

Cover Fire

One of the key advantages of a gun is to make the other guy duck. One character armed with a weapon capable of firing on automatic may grant characters a Defense bonus of +2, or his Dexterity modifier, whichever is higher.

Suppression Fire

A character with a weapon capable of automatic fire may attack a hex, instead of a target. Anyone in that hex who

Vehicle Combat

To dodge or suck it up… that is the question: A fundamental question that must be answered when a vehicle is designed for combat is whether that vehicle will rely on the strength of its hull or the skill of its driver. The armors listed later in this book for vehicles all have a Maneuver and Movement penalty listed. While this functions to reduce movement and control skill checks it also reduces the Class Defense and Dexterity bonus that a skilled driver can add to the vehicle (see the modified Aircraft Operation, Combat Driver and Surface Vehicle Operation feats for more information on this).

does anything except hit the dirt and stay there suffers an attack of opportunity. This ability does not allow a character to make more attacks of opportunity than normal.

Bombing

Bombs work much like conventional attacks, except that they have no maximum range, and are unaffected by a character's skill. Regardless of the BAB of the character dropping the bomb, the base attack bonus of a bomb is +0, modified by things like Bombing Runs (see aerial combat below), and "smart" bomb technology. The bomb keeps falling until it hits the ground. If an attack roll with a bomb is a natural 1, that bomb is a dud, and does not explode. It will need to be found and defused after the battle.

Bombs ignore all cover less than 90%, and all concealment. Concealment might affect the ability to find the target and recognize it as valuable enough to bomb, but once the bomb flies, there is no miss chance from concealment.

A bomb does full damage to whatever it hits, and then damage to everything around it.

When a bomb strikes, it makes separate ranged touch attack rolls on all targets within one range increment at full damage and a BAB of +10. These attacks continue out to additional range increments, with the bomb losing –2 BAB and 2 dice of damage, and continue until the bomb's damage, modified for range, would be 0.

Dogfighting (Aerial Combat)

Aerial combat is the true test of any fighter pilot's abilities, and requires him to be in peak mental and physical condition. This is why jet pilots, especially those who qualify for elite top gun style programs must be the best of an already elite group.

Aerial Stunts

Trailing (DC skill vs. skill)

Getting behind an enemy fighter is the coup de grace of most aerial combats. This stunt requires a pilot vs. pilot skill check. A trailing aircraft negates an opponent's Defense bonus from speed, and gains a +4 to all attack rolls against that aircraft.

Clear Your 6 (DC skill vs. skill)

The opposite of Trailing, this is used both to resist being trailed, and for shaking an aircraft loose. Aircraft with a Wingman or an Escort get a bonus to this check.

Brinksmanship (DC 20)

This stunt involves putting your own craft in danger, forcing your opponent to follow you if he wishes to continue attacking. The pilot initiating this stunt performs a dangerous activity (such as flying under a bridge or into a train tunnel), and makes a pilot check. If the initiating pilot fails the check for this stunt (DC 20), his aircraft takes 1d6 damage for each point by which he fails this check. If he succeeds, his check becomes the DC for an aircraft to follow him (so if the character rolls a 23, an aircraft trying to stay with him would also have to roll a 23).

If an aircraft chooses not to follow the character, attacks against the character's aircraft receive a 50% miss chance (as if totally concealed) for the next 1-4 rounds.

Nap of Earth Flying (DC 20)

A very dangerous way to fly. By flying at extremely low altitudes, the character can avoid being detected by radar. If any unexpected obstacle appears in the character's path, this check must be made again to avoid a sudden landing (called a crash).

Wingover (DC 15)

This maneuver allows an aircraft to make an extra 90-degree turn.

Loop the Loop (DC 20)

This maneuver allows the character to turn the tables on a trailing opponent. A successful check allows the character to make an attack of opportunity against a trailing opponent, and immediately roll a skill vs. skill check to begin trailing his pursuer as well. If this check fails, the pursued craft gets an attack of opportunity against the character. This stunt is an attack action.

Bombing Run (DC 15)

By flying steady and still while releasing bombs, an aircraft can greatly increase the accuracy of those attacks, gaining a +1 to hit for each round it performs a Bombing run (so if the

aircraft performed this stunt for 6 rounds before releasing bombs, it would gain a +6 to hit). However, this also makes the craft very vulnerable to incoming fire. The craft loses all defense bonuses gained from speed, and cannot perform any stunts while executing this maneuver.

Submarine Warfare

Craft under the water have tremendous advantages, using the waters to go undetected, waiting for the right moment to strike. Against ordinary surface ships, a submerged submarine has total concealment (all attacks have a 50% chance to miss and attackers must guess target's location). This concealment also gives the craft a +10 Hide bonus to avoid being seen by surface ships. This advantage was so great, that in WWII countries with large submarine fleets were able to choke off trade over the seas, requiring new tactics and technology to overcome.

Aircraft vs. Submarine

 When a submarine is close to the surface, where it can attack surface vessels, it is more visible from the air. Against an aircraft, a submarine in position to attack has only one half concealment (a 20% chance for weapons to miss). The submarine can regain its concealment by going deep, but cannot attack surface vessels at depth.

Worse still for the submarine, many aircraft are equipped with sonar buoys, which negate the submarine's concealment against *all* attacks, including those from surface vessels. If aircraft start dropping buoys into the water, a submarine commander would be wise to run.

As if the ability to spot the submarine, and render it visible to ships on the surface weren't bad enough, many helicopters are also equipped with torpedoes and depth charges to take care of enemy submarines themselves.

Because of this powerful ability to detect and destroy submarines, many naval vessels now carry helicopters specially equipped to detect and destroy submarines.

Submarine vs. Submarine

If a submarine goes deep, it has insulated itself from most forms of surface attack (depth charges being an exception). However, there is no defense except skill and guile in the cat and mouse game that is the true test of all submarine commanders: enemy submarines.

The waters offer only the defense that the sub driver's skill can grant. The Drive skill of a submarine's driver becomes the Hide skill of that submarine. This is contested skill vs. skill against the Listen skill of an opposing submarine's Sonar operator.

Surface vs. Submarine

Against a submarine in attack position, many surface vessels have torpedoes of their own to fight back. Once a craft goes deep, a surface vessel's best option is depth charges. Unless the vessel has sonar buoys in the water, it will be attacking blind with its first depth charges. The trick is to use a *lot* of depth charges, look for signs of damage (oil is a good indicator of a solid hit), then slowly refine the depth settings of the explosives.

Depth Charges attack at the normal concealment chance (if the submarine's position is not known the attacks have a base 50% chance to miss). However, each hit can be detected by surface sonar on the ship, and by signs of damage floating to the surface. Each hit reduces the submarine's concealment by 10%.

CHAPTER 2: CRAFTING GEAR

The sleek attack craft dropped out of the sky over the tiny camp on the shores of Lake Ontario. Alarms immediately sounded. In moments the craft was besieged.

"Sir! Automated tanks! Coming from out of the old aircraft hanger!"

"I know Lieutenant. I designed them. Get your men ready. They have little EMP shielding. Properly equipped as your men are we should expect minimal casualties."

The line of men stood four abreast in the craft as the ramp slowly lowered, clutching their weapons to their chests, preparing for battles.

"The Captain will lead the attack."

"Sir? The Captain?"

"Yes, Lieutenant. I repaired him. Almost as good as new. Isn't that right, Captain?"

The eyes of the men turned to see their Captain emerge from the rear of the attack craft. Circuits and wires where his face once was. Small cameras for eyes. He snapped his arm and the whip that used to be his right hand crackled menacingly on the deck with a shower of electric sparks. His voice channeled past what was left of his vocal cords into a voice synthesizer.

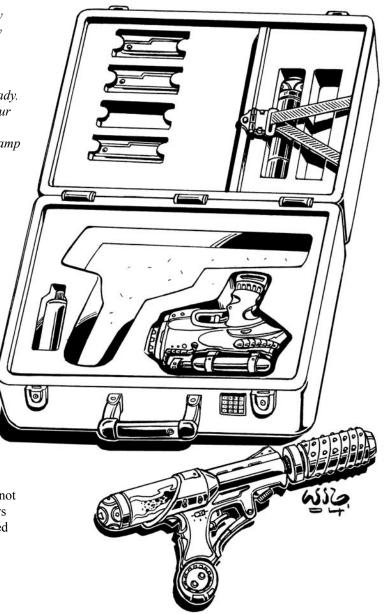*"Yes Sir, General. Now you heard our leader! Attack!"*

The core modern rules handle invention like any other skill. Spend some wealth, take some time, roll the dice. If you make your check you're golden and if you didn't you're not. While such a system works fine for skills like Move Silently or for a campaign that does not place a heavy emphasis on creating objects, game masters using the rules presented in Blood and Circuits are offered this optional system for item creation: *Invention Points*.

The Design Process

Following is a synopsis of the above material to show the design process of a new invention. After the description of each type of object that can be created below you will find an example of an item's design and creation.

1. Theoretical Design

The first step in designing a new item is deciding what it is and what you want it to do. Go through the tables that follow in this chapter and write down what you want the item to be and do, then total the materials cost and Invention Points the item will require (these topics are covered in depth later in this chapter).

2. Gather Raw Materials

This involves making a wealth check. If the character fails he must choose to wait while searching for suitable materials (at a price he can afford) or settle for cheaper or less suitable materials and increase the item's prototype modifier.

Determining Purchase DC: The purchase DC for an item you are designing is actually the cost of the raw materials. Materials for exotic items can be restricted in much the same way as items themselves and may be rated as Licensed , Restricted or Military . The additional cost (+1-+3) is for a

character without the necessary access buying the materials on the black market.

Progress Levels: The Progress Level of an item also factors into the materials cost of an item. For each PL above the current technological level (PL 5 for campaigns taking place in the modern era) add +5 to the materials cost of an item. Any item more than one PL higher than the modern era (PL 7 or higher) cannot be made at all except with the GM's permission. Usually this means the campaign involves super-science or superpowers.

3. Skill Checks

Make skill checks to generate Invention Points. The time it takes to make each check is determined by the character's ranks in the craft skill being used to create the item. Each check adds one to the item's prototype modifier.

4. Item Completed

Game master writes down the total prototype modifier. Bugs are discovered when a character using the device rolls a natural one or whenever an opponent threatens a critical against him while using the device. Bugs impose a permanent penalty when using the device until corrected by use of the Repair skill.

Invention Points

In this optional system an item is created slowly by successive skill checks. The cost of an invention is rated in Invention Points and each time the inventor works on it (how long will be determined by the inventor's skill- see below) he makes a Craft skill check (d20+ his total skill modifier) and adds the points together. When he has generated more Invention Points than the item requires he has completed a working prototype. Note that while this effectively means that even a character with 1 rank in a Craft skill could eventually make a very complex item (if he was willing to take a *long* time to do it) there are some significant advantages to having a high skill, namely prototype modifiers (see below).

Time Between Skill Checks: How long it takes a character to generate Invention Points is a function of the ranks he has invested in the requisite craft skill required to construct the object. A character with a very high number of ranks will have made similar objects before and have all the needed tools on hand to perform his task. A character with a low number of ranks, on the other hand, is essentially learning as he goes and will need to make frequent work stoppages to gather tools he didn't think to have on hand and to consult manuals on the construction of the item in question.

Skill Ranks	Check Time
1-5	3 days
6-10	Daily
11-15	Twice per day
16-20	Four per day
21+	Hourly

This assumes a character works on an item part time (between adventuring and career responsibilities). If a character does nothing else but work on the item he may make checks one-step higher on the table. This requires a character to not adventure for the entire time required to make his next invention check and also reduces the wealth gained from Profession checks when a character gains his next level by 1-4 points (if a character burns the midnight oil repeatedly between levels he might actually end up *losing* wealth when he makes his next Profession check - this could represent the character burning savings to pay bills or perhaps being demoted at his day job).

A character may also move one step up the table if he has skilled assistants working with him on the project.

Using Craft DC Instead of Invention Points

Craft DCs: Blood and Circuits uses the Invention Point system to allow for an item to be made gradually, rather with one succeed or fail roll. The feeling was that the traditional "succeed or fail" system worked well for skills like Open Lock or Hide, but not so well for a long complicated project.

However the system also works well with the traditional DC rules with the simple modifications presented here.

First total up the Invention Point cost of the item as normal and divide by 10. This determines the Craft DC of the item in question.

For complicated items this will result in extremely high DCs. For DCs over 30, assume that an additional check needs to be made for each ten points the DC is higher than 30. So an item with a DC of 60 would instead require 4 successes at a DC of 30.

If the GM wishes to use the traditional Craft DC rules but also wants to include Prototype Modifiers, give an item a base Prototype Modifier equal to the number of successes needed times the number of times the character fails his Craft skill check before achieving the required number of successes.

Continuing the example from above the item would have a base Prototype modifier of 8 if the character failed one roll or less before achieving 4 successes. If the character failed two skill checks the item would have a Prototype modifier of 8, if he failed three times the item would have a Prototype modifier of 12, and so forth.

Crafting Stock Items

The system presented here assumes that an invention is a prototype or significant modification of an existing device. If a character wishes to make a duplicate of an "off the rack" item found in the core modern rules he must spend wealth and Invention Points as detailed in these rules, but the item will have a prototype modifier of 1 to 4 (since nothing is perfect).

However, if the character modifies an item from its stats in the modern core rules to the point that the invention cost rises by 20% or more the item uses all the rules presented here including prototype modifiers.

Making a duplicate item is also faster, move one step up the skill check table (see below).

All assistants must have at least one rank in the requisite class skill required by the item. To make checks faster the character must have at least one worker for each 20 Invention Points the finished item will cost (so an item that will cost 300 points requires 15 assistants to speed up construction).

Characters can still aid another normally to provide a bonus on skill checks, but moving up on the table in terms of how often skill checks are made requires a lot of extra hands.

Skill Checks and Prototype Modifiers: Each time a character makes a skill check he adds one prototype modifier to the item in question (see below for more information on how these affect the finished product). Since a character with a high skill will have to make fewer checks to accumulate the Invention Points necessary for success this also means he will generate fewer bugs in the creation of his devices (certain feats and class abilities might reduce this amount even further).

Prototypes

Every time you invent a new (or significantly modify an existing) item it will always have *ahem* design flaws. Perhaps the metal in the firing pin will get suddenly tired of being where it was or a hundred other unforeseen problems could crop up in the design or implementation of an item. Blood and Circuits handles this concept with *prototype modifiers*.

Prototype Modifiers: A core concept to all equipment design is the prototype modifier. Prototype modifiers occur naturally during the creation of an item and represent minor flaws that must be corrected as they are discovered. This occurs even in "known" technologies and not just in the creation of something completely fantastic and new (such as a car that doubles as a submarine). For example: new race car engines, designed by experienced race car engine designers, still have flaws the first few times they are used in a race, even though the designer has built similar high-tolerance engines before and despite the fact that the internal combustion engine is a thoroughly understood technology.

Generating Prototype Modifiers

Prototype modifiers are generated in three basic ways: skill checks, rush jobs and cheap materials.

Skill Checks: Each time you make a skill check to generate Invention Points you generate one prototype modifier. This means a character with a high skill will tend to generate items with fewer bugs.

Rush Jobs: You may add additional prototype modifiers to an item to complete it faster. Each time you make a skill check you may declare you are rushing and add to your skill roll as if you had just spent an action point. However instead of deducting an action point from your total the GM adds one to the invention's total prototype modifier.

Note that if you actually spend one or more action points to aid in the completion of a device this does not count as a rush job, it is simply good fortune or divine inspiration at work.

Cheap materials: You may add prototype modifiers to an item to make it cheaper. You may add +2 to your wealth check to pay for the item's raw materials for each +1 you add to the invention's total prototype modifier. You may even decide to do this after you make your wealth check. For example if you are attempting to build an invention whose raw materials cost is 20 and you roll a 10 on your wealth check you may decide to settle on cheaper materials and begin construction now rather than wait to gather the needed materials, adding 5 to the item's eventual prototype modifier (since the wealth DC is the number of hours it takes to make a wealth check a wealth-challenged character might end up spending as much or more time shopping for quality raw materials as building the item itself).

Effects of Prototype Modifiers

At certain times during each game, when you roll a 1, whenever anyone attacking you scores a critical threat or whenever the GM wants to be fiendish (this latter can happen no more than once per game, however- the GM doesn't get to be fiendish every round of a critical combat- sorry guys!), he will activate a prototype modifier, giving you a –1d6 modifier to one aspect of your device, such as to hit, damage, defense, movement, etc. until the bug is worked out. Think of prototype modifiers as anti-action points.

Each time a prototype modifier is activated the prototype modifier of the item is permanently reduced by one. The prototype modifier represents potential bugs and you have just found one.

Bugs generated by prototype modifiers last until repaired (see below).

Working the Bugs Out: A character has three chances to work out a bug. The first attempt may be made in combat as an attack action and requires a Repair skill check (DC 20 + the item's current prototype modifier).

The second attempt can also be attempted in the field and requires 5 minutes (50 rounds) to perform. This check also requires a Repair skill check (DC 15 + the item's current prototype modifier).

The final attempt can only be performed in a garage or workshop and requires 4-24 hours to perform (4d6 hours). This check also requires a Repair skill check (DC 10 + the item's current prototype modifier).

If this final skill check fails the bug is in fact a *design flaw* and is a permanent feature of the device (including any copies of the device that have been made - the next prototype modifier activated after a flaw is discovered will be that flaw and may never be repaired). However some copies of a device through random chance might have been spared this design flaw. Copies of an item that have already had their prototype modifier reduced to 0 (meaning all bugs have been identified and possibly worked out) are mysteriously free of this design flaw.

Back to the Drawing Board-Eliminating Design Flaws: So how exactly *do* you get rid of design flaws if you have failed to correct the problem? The answer is you must go back to the drawing board.

To benefit from going back to the drawing board you must make an *exact* copy of the item you are attempting to improve without adding any new features. If you succumb to this temptation (known as "feature creep") you have started an entirely new design that will have an entirely new prototype modifier with potentially new (and totally different) bugs and design flaws.

The process is much the same as making a copy of an item. However, you must spend Invention Points equal to fifty times the design flaw's penalty (so 50 for a flaw that imposes a –1 penalty through 300 for a flaw that imposes a –6 penalty). Craft rolls to generate these points do *not* add to the item's prototype modifier.

When these points have been spent the design flaw has been puzzled out and corrected and the completed item will be free of it.

Making a Copy: Making a copy is explained in the Crafting Stock Items section above.

Weapons Design

Modular Weapon Design

1. Determine weapon type (melee/thrown, archaic ranged or ballistic) damage
2. Add modifiers (optional)
3. Determine clip size and cost (ballistic weapons)
4. Determine weapon mounting (ballistic weapons)

Archaic Weapons

The base statistics for archaic weapons are determined by its damage (see table 2-2). Ranged or thrown archaic weapons are additionally modified by their desired range increment (see table 2-2).

Archaic Weapons Modifiers

Aerodynamic (Thrown Only)
Purchase DC: +2
Invention Points (Craft mechanical): +20
Effect: +50% range on thrown weapons

Compact
Purchase DC: +2
Invention Points (Craft structural): +20
Effect: This modifier reduces the size of an archaic weapon by one category to a minimum of Diminutive.
Special: A weapon may not be modified to have this ability it must be included as part of a weapon's construction. This modifier may only be purchased once.

Exotic Weapon
Purchase DC: +2
Invention Points (Craft mechanical): -20
Effect: Weapon requires a unique Exotic Weapon Proficiency feat to use without a –4 penalty. Weapons that are exotic by default (ones that do 3 dice or more damage) cannot take this modifier. If the melee weapon is large, the weapon may be wielded one handed by a character that possesses the Exotic Weapon Proficiency feat.

Improved Critical
Purchase DC: +3
Invention Points (Craft structural): +30
Effect: Weapon's critical threat range or critical multiplier is increased by 1.
Special: This modification may be applied twice, increasing the critical threat range or multiple by 1 more (for a maximum of 18-20 or x4). A weapon may never increase both its threat range and multiplier.

Archaic Weapon Material

Weapons like spears and swords have been around for millennia but are still considered viable weapons to this day (if you doubt the truth of this, realize that a rifle with a bayonet is essentially a spear and that the Japanese military uses spear techniques which date back to the Tokugawa period to train their soldiers in the bayonet). What allows these weapons to continue to be potent and useful additions to the warrior's arsenal throughout the ages are the materials they are constructed from. Stone-tipped spears give way to bone, then to bronze, steel, and in the modern world

Table 2-1: Melee/Thrown and Archaic Ranged Weapons Damage

Type	Damage	Weight	Purchase DC	Base Size	Invention Points (Craft structural)	Materials Restriction
Simple	1d4	2 lbs.	6	Small	40	---
Simple	1d6	4 lbs.	7	Medium	60	---
Archaic	1d8	6 lbs.	8	Large	80	---
Archaic	1d10	10 lbs.	9	Large	100	---
Archaic	1d12	15 lbs.	10	Huge	120	---
Archaic	2d6	15 lbs.	10	Huge	120	---

materials such as titanium. In the future it is reasonable to assume that materials will continue to get stronger and lighter at the same time.

Material: The material used for the damage dealing portion of the weapon. For an arrow or spear this is just the tip while for blades it is typically the entire item.

Damage Modifier: The increase in dice ranks. Dice ranks progress as follows: 1d2, 1d3, 1d4, 1d6, 1d8, 1d10, 1d12, 2d8, 2d10, 2d12, 3d8 and so forth.

Weight Modifier: The increase or decrease of the item's weight listed as a % of the standard item.

Purchase DC Modifier: The adjustment to the item's price. If the adjusted wealth cost of the item is low enough that the character can declare the weapon is "on hand" (see the Wealth rules for more information on this) a character may make the appropriate craft skill and concoct a crude version of the weapon in one minute. A crude version of a weapon takes a –4 to hit unless the character is proficient with improvised weapons, in which case he takes no penalty to hit with the ad hoc weapon. For example a character with the appropriate skill could find a sharp rock, shape it crudely by banging it against another rock, tie that rock to a stick with some vines and fashion a (very) crude spear.

Invention Points Modifier (Craft structural): The modifier to the Invention Points.

Materials Restriction: The progress level at which the material appears. Materials one PL higher than the campaign baseline can be used but add +5 to the Purchase DC (and might very well add an additional +3 for military restriction at the GM's discretion).

Stone

Only the simplest of societies (or the most desperate) use weapons made from this material. On any natural attack roll of 5 or less a stone weapon breaks and becomes useless. In addition to being prone to cracking and splitting, stone is heavy, and stone weapons tend to be bulky and cumbersome despite the fact that the stone cutting surface is made as small as possible with the majority of the weapon (the handle or shaft) being wood.

Bone

The best material available to PL0 societies, bone is difficult to work (almost twice as difficult as stone) and even more fragile. However it is much lighter and can be honed to a

Table 2-2: Thrown/Archaic Ranged Weapons

Range Increment (Thrown)	Purchase DC	Invention Points (Craft structural)
10' (5')	+1	+20
20' (10')	+2	+30
30' (15')	+3	+40
40' (20')	+4	+50
50' (25')	+5	+60
60' (30')	+6	+70
70' (35')	+7	+80
80' (40')	+8	+90
90' (45')	+9	+100

much sharper point. Bone cannot be used to make a sword or axe however spears and arrows tipped with bone are highly prized weapons in PL0 cultures despite their fragility. On a natural attack roll of 10 or less a bone weapon shatters and becomes useless.

Bronze

Relatively light and strong, bronze is a technological leap forward from bone and stone and pushed the first cultures to master its production to the forefront of the ancient world. Soon any country that fancied itself a military power fielded soldiers wielding weapons and armor made of this alloy. Bronze is a soft metal and any bronze weapon shatters on a natural attack roll of 2 or less. Also an edged weapon made of bronze (such as a sword) has to be sharpened after each battle in which it is used (requiring a Repair skill check with a DC of 10 to properly sharpen) and suffers a –1 penalty to attack and damage rolls until this is done.

Iron

Much stronger and able to hold a much sharper edge than bronze, iron is a vitally important metal to the ancient cultures despite its heavy weight and how difficult it is to work. Iron weapons can become brittle over time and on a natural attack roll of 1 the weapon shatters and becomes worthless. Iron weapons are prone to nicks that can shear the weapon if they are not properly maintained. After every five fights an iron weapon suffers a –1 penalty to hit and damage until it is repaired, requiring a Repair check (DC 10). Also while the weapon has a penalty to damage due to lack of maintenance the weapon will break twice as often (on a natural roll of 2 or less).

Table 2-3: Archaic Weapon Material

Material	Damage Modifier	Weight Modifier	Purchase DC Modifier	Invention Points Modifier	Materials Restriction
Stone	-2d*	+25%	-6	-60	PL0
Bone	-1d*	+0%	-3	-30	PL0
Bronze	-1d*	+25%	-2	-20	PL1
Iron	-0d	+50%	-1	-10	PL1
Steel	-0d*	+0%	+0	+0	PL2
Titanium	-0d*	-25%	+2	+20	PL4
Dura-steel	+1d*	-25%	+3	+30	PL6
Plasteel	+2d*	-50%	+4	+40	PL7
Live steel	+3d*	-75%	+6	+60	PL7
Energy	+5d*	-90%	+8	+80	PL8

Steel

The alloy of the industrial age, steel's strength and relatively light weight allow armor to enter the battlefields in ways previous progress levels did not. Steel clad ships roam the sea at this progress level. The technological effect of steel has a great impact on a culture and steel will be a primary material for war and construction from PL 2 all the way until mid-way through PL 6. Working steel becomes easier over time however and the GM may reduce the cost of a steel weapon by one for each PL over 2 in the campaign.

Titanium

Titanium is stronger than steel allowing less material to be used (reducing the weight of weapons considerably). However it holds an edge no better and provides no damage bonus.

Dura-Steel

This material is really a whole range of advanced metals that are seen in limited military service near the end of PL 5. Spent uranium alloy is the first of these advanced metals discovered but many different advanced metals are in use by the end of PL 6.

Plasteel

Combining the weight and ease of construction of plastic with the strength of steel, Plasteel spells the end of metals as the main material for weapons and construction for over a century.

Live Steel

Steel returns to widespread use not because of a breakthrough in the metal itself but because of the use of nanites. These microscopic robots allow much less metal to be used, roaming the surface of an object and repairing cracks and imperfections invisible to the naked eye. Razor sharp edges can also be maintained on weapons by an army of invisible nanites that hone the blade and repair microscopic nicks twenty four hours a day.

Energy

The ultimate material, energy is weightless and simply requires the weapon's handle to contain a power source to generate the weapon when needed.

Ballistic and Energy Weapons

These weapons are vast improvements over the handheld or thrown weapons found in earlier progress levels. Possibly the first such weapon was the crossbow, but from there gunpowder and eventually energy projectiles quickly dominate this field of weaponry.

Ballistic And Energy Weapons Modifiers

Alternate Weapon

Purchase DC: +4
Invention Points (Craft mechanical): +40
Effect: This allows two weapons to be combined into one. This could represent multiple settings on a weapon, an over-under assault rifle/grenade launcher combination or something as simple as a bayonet. The alternate weapon must be purchased (and constructed) as well.
Special: A weapon may be modified in this fashion but the purchase DC and Invention Point cost are tripled.

Armor Penetrating

Purchase DC: +2
Invention Points (Craft mechanical): +20
Effect: This weapon is designed to penetrate armor and ignores 5 hardness if it strikes a vehicle, building, or object.
Special: This modification may be taken twice for a total of 10 hardness.

Autoloader Module

Purchase DC: +3
Invention Points (Craft mechanical): +30
Effect: This device allows a weapon to be reloaded as a free action.

Table 2-4: Ballistic And Energy Weapons Modifiers

Type	Damage	Avg. Weight	Purchase DC	Invention Points (Craft mechanical)	Materials Restriction	Minimum Size
Personal Firearms	1d4	2 lbs.	11	110	Lic.	Small
Personal Firearms	1d6	3 lbs.	12	120	Lic.	Small
Personal Firearms	1d8	4 lbs.	13	130	Lic.	Medium
Personal Firearms	1d10	5 lbs.	14	140	Res.	Medium
Personal Firearms	1d12	6 lbs.	15	145	Res.	Medium
Personal Firearms	2d6	6 lbs.	15	150	Res.	Medium
Personal Firearms	2d8	7 lbs.	16	160	Res.	Medium
Personal Firearms	2d10	8 lbs.	17	170	Res.	Large
Personal Firearms	2d12	9 lbs	18	180	Mil.	Large
Exotic Firearms	3d6	10 lbs.	18	180	Mil.	Large
Exotic Firearms	3d8	15 lbs.	19	190	Mil.	Huge
Exotic Firearms	3d10	20 lbs.	20	200	Mil.	Huge
Exotic Firearms	3d12	25 lbs.	21	210	Mil.	Huge

Special: A weapon may be modified in this fashion but the purchase DC and Invention Point cost are tripled.

Automatic Rate of Fire

Purchase DC: +2

Invention Points (Craft mechanical): +20

Effect: Weapon can fire with an automatic rate of fire. Only weapons with charges may have this modifier.

Special: A weapon may be modified in this fashion but the purchase DC and Invention Point cost are increased to +10 and +100 respectively.

Collapsible

Purchase DC: +2

Invention Points (Craft mechanical): +20

Effect: A weapon with this modifier may be broken down or reassembled as a full-round action. When collapsed only a Knowledge (technology) check (DC 17) will identify the component parts as a weapon.

Special: A weapon may not be modified to have this ability it must be included as part of a weapon's construction.

Compact

Purchase DC: +2

Invention Points (Craft mechanical): +20

Effect: This modifier reduces the size of a ranged weapon by one category to a minimum of Diminutive.

Special: A weapon may not be modified to have this ability it must be included as part of a weapon's construction. This modifier may only be purchased once.

Computer Targeting

Purchase DC: +5

Invention Points (Craft mechanical): +50

Effect: The weapon gains a +1 to hit. Shoulder mounted weapons with this modifier will automatically track any target the character is looking at, and gain +2 to hit and initiative. This modifier may only be purchased once.

Energy Weapon

Purchase DC: +4

Invention Points (Craft mechanical): +40

Effect: The weapon fires energy instead of ballistic ammunition. This reduces the weight of the weapon by half and allows the weapon to take advantage of the Stun Module and Variable Charge modifiers.

Special: A weapon may not be modified to have this ability it must be included as part of a weapon's construction. This modifier raises the PL of the weapon to at least 6 which might increase the cost further.

Exotic Ammunition

Wealth Cost per clip: +2

Invention Points (Craft mechanical): -10

Effect: This weapon uses custom ammunition, increasing the overall cost but simplifying the design.

Genetic Tags

Purchase DC: +2

Invention Points (Craft mechanical): +20

Effect: Weapons with this modifier have some sort of identifier on their ammunition that identifies the person who fired it.

Special: A weapon may be modified in this fashion. The purchase DC and Invention Point cost are unchanged.

Increased Damage

Purchase DC: +5

Invention Points (Craft mechanical): +50

Effect: A weapon with this modifier inflicts more than 3 dice of base damage. For each die additional (i.e. increasing damage from 3d6 to 4d6) increases the purchase DC and Invention Points (or Craft DC).

Special: A weapon may not be modified to have this ability it must be included as part of a weapon's construction. This modification can only be done on weapons that already have 3 dice for base damage.

Miniaturized

Purchase DC: +5

Invention Points (Craft mechanical): +50

Effect: This modifier reduces the size of a ranged weapon by two categories to a minimum of Diminutive.

Special: A weapon may not be modified to have this ability it must be included as part of a weapon's construction.

Semiautomatic Rate of Fire

Purchase DC: +1

Invention Points (Craft mechanical): +10

Effect: Weapon can fire with a semiautomatic rate of fire.

Sensor Baffling

Purchase DC: +2

Invention Points (Craft mechanical): +20

Effect: A weapon with this modifier has a +4 bonus on any checks to conceal the weapon from sensors or other detection devices.

Special: A weapon may not be modified to have this ability it must be included as part of a weapon's construction.

Spring-Loaded

Purchase DC: +2

Invention Points (Craft mechanical): +20

Effect: The wielder of a weapon with this modifier acts as though he has the Quick Draw feat.

Special: A weapon may be modified in this fashion but the purchase DC and Invention Point cost are tripled. This modifier may only be applied to weapons that are size Small or smaller.

Standardized

Purchase DC: +2

Invention Points (Craft mechanical): +20

Effect: This weapon us built to be easier to handle and allows a weapon that would normally require an Exotic Firearms Proficiency to be used with the Personal Firearms Proficiency instead.

Stun Module

Purchase DC: +2 (Fort Save 12); +4 (Fort Save 15); +6 (Fort Save 18)

Invention Points (Craft mechanical): +20 (Fort Save 12); +40 (Fort Save 15); +60 (Fort Save 18)

Effect: An energy weapon with this modifier can be set to "stun" instead of kill. If the target of the weapon fails the listed Fortitude DC he is stunned for 1-4 rounds.
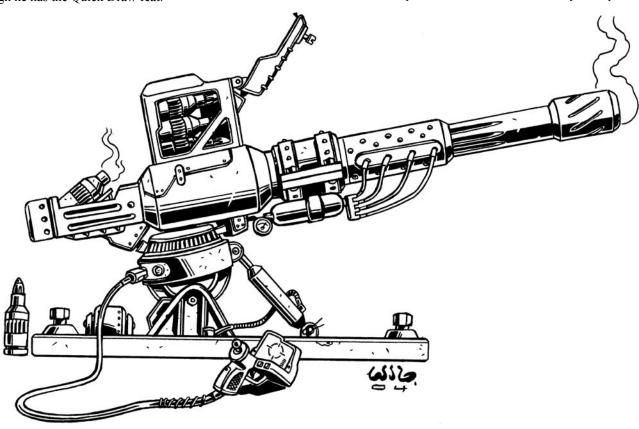
Special: A weapon may not be modified to have this ability it must be included as part of a weapon's construction. Only energy weapons may have this modifier.

Variable Ammunition

Purchase DC: +4

Invention Points (Craft mechanical): +40

Effect: A weapon with this modifier can carry multiple

Table 2-5: Ballistic and Energy Weapons Charges

Clip Size	Purchase DC	Invention Points (Craft mechanical)	Cost per clip 20 rounds (Energy Weapons cost per 20 shots)	Minimum Size
1	-10	-50	1 (11)	Tiny
2	-5	-40	2 (12)	Small
4	-2	-30	3 (13)	Small
8	-1	-20	4 (14)	Medium
16	-0	-10	5 (15)	Medium
32	+2	+0	6 (16)	Medium
50	+4	+20	8 (18)	Large
75	+6	+50	10 (20)	Large
100	+10	+100	15 (25)	Large
Linked	+12	+50	10 (*)	Huge

* An energy weapon with the "linked" clip size is built to run off a larger power supply.

types of ammunition and the wielder may switch between them as a free action. This also effectively doubles the ammunition capacity of the weapon since it will carry separate clips of equal size (one per ammunition type).

Special: A weapon may be modified in this fashion but the purchase DC and Invention Point cost are tripled. This modifier may be purchased more than once.

Variable Charge

Purchase DC: +6

Invention Points (Craft mechanical): +60

Effect: An energy weapon with this modifier can increase the damage delivered in each shot. For each attack action the wielder primes the weapon the damage is increased by +1 die, to a maximum of +4 dice after four rounds of priming. After four rounds the weapon must be fired or it will explode inflicting its normal damage (+4 dice) to the wielder. This also completely destroys the weapon.

Special: A weapon may not be modified to have this ability it must be included as part of a weapon's construction. Only energy weapons may have this modifier.

Weapon Charges

Additionally the number of charges per clip (and the cost of those clips) can modify the cost of a weapon (see table 2-5).

Weapon Mounting

Not only can a weapon's damage and clip size affect its performance, weapons are also affected by the way those weapons are mounted. Usually this has the biggest impact on range, though size and handedness (how many hands it takes to hold and fire the weapon) also come into play.

Type: Indicates what type the weapon is in general terms. Wrist, hand, chest, and shoulder-mounted weapons cannot be disarmed. Shoulder mounted weapons can gain special bonuses when connected to computer targeting devices. Port mounted weapons are weapons that can be fired by the crew inside a vehicle (if a vehicle weapon is not mounted on a port it must be mounted on a tripod and the person firing the weapon does not gain any cover from the vehicle).

Hands: Indicates how many of the character's hands are occupied when firing the weapon.

Range Increment: Indicates the weapon's accuracy at range.

Table 2-6: Ballistic Weapon Mounting

Type	Hands	Range Increment	Invention Points (Craft mechanical)	Purchase DC
Handgun	1	20'	+0	-3
Handgun	1	30'	+20	-2
Handgun	1	40'	+50	-1
Longarm	2	50'	+50	0
Longarm	2	60'	+80	+1
Longarm	2	90'	+100	+2
Bipod/Port	2	100'	+50	+3
Bipod/Port	2	120'	+80	+4
Tripod/Port	2	130'	+100	+5
Tripod/Port	2	150'	+150	+6
Wrist/Hand	1	30'	+50	+7
Wrist/Hand	1	40'	+80	+8
Shoulder/Chest	0	50'	+100	+9
Shoulder/Chest	0	60'	+120	+10
Shoulder/Chest	0	90'	+150	+11

Table 2-7: Sample Weapons

Name	Damage	Critical	Range Increment	Type	Fire	Magazine	Weight	Size	*Purchase DC	Invention Points	Materials Restriction
Disk Blade	1d8	20	30 ft.	Slashing	-	-	4 lbs.	Medium	18	150	---
Pipe Rifle	1d10	20	50 ft.	Ballistic	1	1	5 lbs.	Large	4	140	Res.
X-Blaster Pistol	2d8	20	30 ft.	Fire	Single	8	3 lbs.	Small	17	200	PL 6
X-Blaster Rifle	3d8	20	90 ft.	Fire	Single	32	7 lbs.	Large	33	390	PL 6

* Purchase DC of materials

Invention Points (Craft mechanical): This indicates the difficulty in constructing a weapon with this type of mounting at this level of accuracy. A weapon can be modified as well, involving switching it to a different platform.

Purchase DC: This indicates the cost of mounting a weapon in this fashion. A weapon can modified using this wealth DC as well, involving switching it to a different platform.

Superior Balance

Purchase DC: +2, may be purchased twice

Invention Points (Craft mechanical): 20 may be purchased twice

Effect: Increases range by 25%

Sample Weapons

Following are some pre-created weapons using these rules.

Disk Blade

An edged circular weapon that can be used in melee or thrown. It requires an exotic weapon proficiency (disk blade) to use without penalty.

Modifiers: Base (+80), Compact (+20), Exotic Weapon (-20), Aerodynamic (+20), Range (+50)

Pipe Rifle

A homemade single shot rifle.

Modifiers: Base (+140), Charges (-50), Mounting (+50)

x-Blaster Pistol

A relatively primitive energy weapon this would be the sort found in a state of the art lab in PL 5 or in broad use on the battlefields of PL 6.

Modifiers: Base (+160), Charges (-20), Mounting (+20), Energy (+40)

X-Blaster Rifle

More powerful, with a better range, and more charges, this weapon is extremely deadly in the hands of someone who knows how to use it. This weapon is very unlikely to be found in PL 5 unless the campaign features some form of superhuman intelligence, alien influence or other form of FX. Even in PL 6 this weapon will be restricted to military and law enforcement personnel.

Modifiers: Base (+190), Charges (+0), Range (+100), Energy (+40), Compact (+30), Standardized (+30)

Armor Design

Modular Armor Design

1. Determine Equipment Bonus
2. Add Modifiers (optional)
3. Add Miscellaneous Features (optional)
4. Add Movement Modes (advanced armors only)
5. Add Optics (optional)
6. Add Weaponry (optional- advanced armors only)
7. Add Exoskeleton (optional- advanced armors only)

Armor

Regardless of what else a battlesuit does, its main function is to protect the person wearing it. Everything else is just gravy. Designing armor is a function of the Craft

Table 2-8: Armor Design

Type	Equipment Bonus	Nonproficient Bonus	Max Dex	Armor Penalty	Speed	Weight	Wealth DC	Invention Points (Craft mechanical)	Materials Restriction
Light	+1	+1	+8	-0	30	2 lbs.	6	120	---
Light	+2	+1	+7	-0	30	4 lbs.	7	140	---
Light	+3	+1	+6	-0	30	6 lbs.	8	160	---
Medium	+4	+2	+5	-1	25	8 lbs.	9	180	Lic.
Medium	+5	+2	+4	-2	25	10 lbs.	10	200	Lic.
Medium	+6	+2	+3	-3	25	12 lbs.	11	220	Res.
Heavy	+7	+3	+2	-4	20	15 lbs.	12	240	Res.
Heavy	+8	+3	+1	-5	20	18 lbs.	13	260	Mil.
Heavy	+9	+3	+0	-6	20	21 lbs.	14	280	Mil.
Heavy	+10	+3	+0	-7	20	24 lbs.	15	300	Mil.

(mechanical) skill. The DCs, and the armor proficiencies required for each class of defense, are listed below.

Armor Modifiers

After a character decides what basic sort of armor he wants on a battlesuit, he can modify it based on the type of materials used, as shown below.

Air Supply

Purchase DC: +3

Invention Points (Craft mechanical): +30

Effect: Armor has a 1-hour air supply. May be purchased multiple times.

Each two times this modifier is selected, the armor moves down one place on the Max Dex, Armor Penalty, Speed, and Weight columns that may make the armor require a more difficult proficiency to use.

Chameleonic Surface

Purchase DC: +6

Invention Points (Craft mechanical): +60

Effect: Chameleonic materials are the end result of the marriage of sensor technology and nanotechnology. Similar in many ways to the paint-on LCD of the Information Age, the chameleonic surface armor gadget allows any armor to remake its own image to better blend in with the background. Microsensors on the surface of the armor detect surrounding imagery and project it from the opposite side, in effect coloring the wearer to look just like whatever is behind him. The armor blends in with any background.

This gadget provides the armor's wearer a bonus on Hide checks. For light armor, this bonus is +4; for medium, +6, for heavy, powered, and environmentally sealed armor, +10.

Special: This modifier has a PL of 7 and will only be available in campaigns that allow FX or weird science.

Climate Controlled

Purchase DC: +2

Invention Points (Craft mechanical): +20

Effect: +1 to saves vs. fire or cold attacks and environmental damage due to heat or cold. This also increases the time between saves for environmental damage by ten minutes.

May be purchased multiple times, but only when armor is being constructed. Armor may provide bonuses to both of these environments but each must be purchased separately.
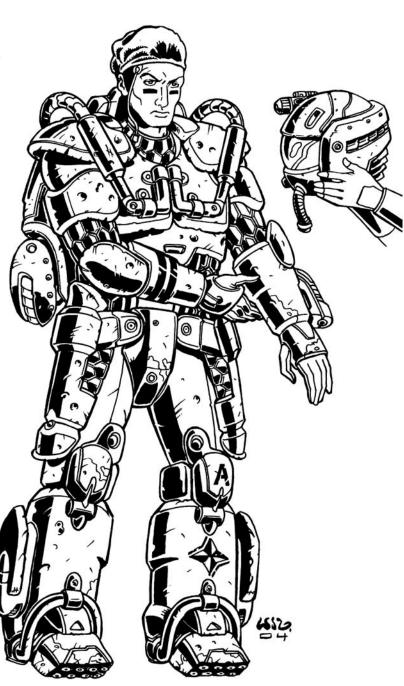
Gravity Anchor

Purchase DC: +4

Invention Points (Craft mechanical): +40

Effect: With space combat almost as common as ground combat in the Energy Age, armor manufacturers seek to make their armor more useful in both space and atmospheric combat. One such enhancement is the gravity anchor gadget, which generates a field of artificial gravity around the armor's wearer. In low gravity and zero gravity conditions, the gravity anchor can be activated to give the wearer the benefits of full gravity in any situation. Characters with this gadget are unaffected by low gravity and zero-g conditions.

Special: This item has a PL of 8 and will only be available in campaigns incorporating FX or weird science.

HazMat Protection

Purchase DC: +2

Invention Points (Craft mechanical): +20

Effect: +2 to saves vs. radiation or hazardous chemical damage. If the save is failed the wearer suffers reduced effects from the environment as if affected by one category less of a danger (so Severe radiation would be reduced to High or Industrial Waste would be reduced to low-grade pollutants). May be purchased multiple times. The Saving Throw modifiers stack. On a failed save the wearer still suffers the effects of one grade below the environmental danger regardless of how many times this modifier has been applied.

Every two times this modifier is selected the armor moves down one place on the Max Dex, Armor Penalty, Speed and Weight columns that may make the armor require a more difficult proficiency to use.

Gamma Radiation Protection

Purchase DC: +2 (moderate), +3 (High), +4 (Severe)

Invention Points (Craft mechanical): +20 (moderate), +30 (High), +40 (Severe)

Effect: This modifier protects the wearer from the effects of gamma radiation. The level depends on the quality of the system and grants total protection against radiation of the respective level and lower. If the wearer encounters radiation above the level of his protection, he suffers the full effects (HazMat Protection can help reduce those effects).

Lightweight Alloys

Purchase DC: +2

Invention Points (Craft mechanical): +20

Effect: Armor's Max Dex, Armor Penalty, and Speed moves one place up (up is better) the table while defense remains unchanged. May be purchased multiple times but only when armor is being constructed.

Morphic Metal Alloy

Purchase DC: +6

Invention Points (Craft mechanical): +60

Effect: A combination of nanotechnology and armor engineering, morphic metal alloy is a special material used in the construction of armor to enhance the user's ability to move freely. When activated, morphic metal bends and shapes itself to the contours of the wearer's body, giving it both a snug fit and increased mobility. An armor with the morphic metal alloy gadget reduces its armor check penalty by 1 and increases the maximum Dexterity bonus by 1 as well.

Special: This device has a PL of 8 and will only be allowed in campaigns that feature FX or weird science.

Nonconductive

Purchase DC: +1

Invention Points (Craft mechanical): +10

Effect: +1 saves vs. electrical attacks. May be purchased multiple times, but only when armor is being constructed.

Nonmetallic Alloys

Purchase DC: +2

Invention Points (Craft mechanical): +20

Effect: Armor is unaffected by magnetism and does not show up on metal detectors.

Refractive Coating

Purchase DC: +3

Invention Points (Craft mechanical): +30

Effect: +1 saves vs. all energy attacks. May be purchased multiple times, but only when armor is being constructed.

Sonic Filter

Purchase DC: +1

Invention Points (Craft mechanical): +10

Effect: +1 save vs. sonic/deafening attacks. May be purchased multiple times.

Bulky

Purchase DC: -1

Invention Points (Craft mechanical): -10

Effect: Armor's Max Dex, Armor Penalty, and Speed moves one up the table while defense remains unchanged. May be purchased multiple times but only when armor is being constructed.

Hot

Purchase DC: -3

Invention Points (Craft mechanical): -30

Effect: Saving throws against environmental effects related to heat and thirst are modified by the armor penalty of the suit.

Added Restriction Level

Purchase DC: -1

Invention Points (Craft mechanical): -10

Effect: Each time this is taken the item moves up one level of restriction (from no restriction to Licensed, from Licensed to Restricted and from Restricted to Military).

Miscellaneous Modifiers

This is equipment that a character may want which does not fit into any of the other categories, such as communications gear and onboard computers.

Police Band Radio

Purchase DC: 15

Invention Points: 150

Effect: You can communicate and monitor official

police and government frequencies with a move action (this is normally a wrist mounted radio and difficult to use in combat).

Special: For +5 Wealth Cost and +50 Invention Points (+5 Craft DC) the radio can be miniaturized for the helmet, and can be voice activated. This allows the communications system to be used as a free action.

Prehensile Appendage

Purchase DC: +6

Invention Points (Craft mechanical): +60

Effect: Useful for scientists, explorers, and others that have need for an extra hand, the prehensile appendage gadget is both utilitarian and expensive. Essentially, this gadget consists of a long flexible cylinder capped at the end with a grasping claw that attaches to the armor's side or back. The prehensile appendage gadget essentially gives the wearer of the armor an additional hand with which to hold and manipulate objects.

The gadget cannot be used to make normal melee attacks or fire ranged weapons, but it can make grapple attempts (with a Strength bonus of +2 and using the wearer's base attack bonus). The appendage is controlled through a pair of gloves worn by the user; by issuing commands via a specific set of hand signs, the wearer can order the gadget to pick up, drop, or manipulate an object once per round as a free action.

Special: This modifier has a PL of 6 and will raise the Wealth cost by +5 in a modern campaign unless the character possesses the Cutting Edge feat.

Self-Repairing

Purchase DC: +6

Invention Points (Craft mechanical): +60

Effect: The self-repairing gadget implements nanotechnology in its infancy to repair minor damage to armor. Whenever the armor is damaged, the self-repairing gadget immediately issues commands to a set of nanites that move to the problem spot and begin making repairs. The gadget repairs 1 point of damage per minute to the armor.

Special: This modifier has a PL of 6 and will raise the Wealth cost by +5 in a modern campaign unless the character possesses the Cutting Edge feat.

Movement
(Advanced Armors Only)

One of the main functions of battlesuits in fiction is the power of flight. You can add flight to a sturdy suit of armor, making yourself a force to be reckoned with on the battlefield, or simply make a flight harness, with a little bit of armor, to represent the jet packs so common in comic books (especially comics of the Silver and Bronze Age where they sold jet packs at corner stores).

The main difference between the movement granted by a battlesuit and that provided by a vehicle is that the movement functions much more like a power than a vehicle. In other words, you don't use a pilot skill to "fly" a battlesuit or jetpack; you take the Combat Flight feat to improve maneuverability like a character with Flight through a power would do.

Enhanced Speed

Purchase DC: +2 per 5 feet

Invention Points (Craft mechanical): +20 per 5 feet

Effect: The ground speed of the armor is increased by 5 feet each time this modifier is taken. This may increase the speed beyond the speed of the wearer thus enhancing is movement.

Special: Armor without an exoskeleton cannot utilize this modifier.

JumpJets

Purchase DC: 10 + 1 per jump bonus.

Invention Points (Craft mechanical): 100+ 10 per Jump bonus

Effect: +3 to Jump skill checks, no limit for maximum jump distance. May be purchased multiple times.

Jet Powered Flight

Purchase DC: 10 + 2 per movement bonus.

Invention Points (Craft mechanical): 100 + 20 per movement bonus

Effect: 10' flight movement, at clumsy maneuverability (this may only be improved through Combat Flight feats). May be purchased multiple times. Moves armor's Max Dex, Armor Penalty, Speed, and type down one step on the Armor table. Armor movement's penalties apply to flight movement as well.

Miniaturized Flight Rig

Purchase DC: +1

Invention Points (Craft mechanical): +10

Effect: Reduces armor penalties due to Jet Powered Flight by one step. This may only be used to eliminate weight penalties from the flight rig. If you wish to make the armor itself lighter, see lightweight alloys above.

Optics / Sensors

In recent years, optics and sensors have grown in importance and utility on the battlefield. Comics characters have enjoyed the power of nightvision for decades however, and these accoutrements will be a popular addition to any character's armament.

Optics can be created as standalone items such as goggles as well as built into armor. If built into armor, the optics are created separately from the armor.

Chemical Sensor

Purchase DC: 4

Invention Points (Craft electronics): 40

Effect: This modifier detects chemical agents (not radiation), including hazardous chemicals (any form), chemical contaminants, and various nerve/irritant/blood agents. A chemical sensor's range is 50 ft.

Geiger Counter

Purchase DC: 4
Invention Points (Craft electronics): 40
Effect: This modifier detects the exact Radiation level in an area. A Geiger counter has a range of 75 ft.

Night Vision Optics

Purchase DC: 10
Invention Points (Craft electronics): 100
Effect: You gain Dark Vision out to a range of 120 feet.

Polarizing Lenses

Purchase DC: 10
Invention Points (Craft electronics): 100
Effect: Immune to blinding attacks

Telescopic Optics

Purchase DC: 10 + 1/2 per bonus
Invention Points (Craft electronics): 50+10 per bonus
Effect: Your optics give you a +1 equipment bonus to spot checks. May be purchased multiple times.

Radar

Purchase DC: 20
Invention Points (Craft electronics): 250
Effect: Your battlesuit has a built in radar system allowing the detection of objects at ranges of several miles on a Spot skill check (this check is at –4 unless you possess the Radar Operation feat). See the Spot skill for more information on the use of radar. This use of the spot skill may not be used untrained. Radar may be made more accurate using the Telescopic Optics modifier. However this modifier must be bought separately for Radar and normal visual detection. Radar does not work underwater.

X-Ray

Purchase DC: 20
Invention Points (Craft electronics): 250
Effect: This form of super-advanced optics permits the wearer to see into and through solid matter. The range is as per normal sight (not limited by darkness, however), with the viewer seeing as if he were looking at something in normal light even if there is no illumination (for example, if looking through a wall into a darkened room, he can see beyond even if it is utterly dark).

The vision provided by x-ray optics can penetrate 20 feet of cloth, wood, or similar animal or vegetable matter. It can see through up to 10 feet of stone, 10 inches of iron, steel, copper, and brass, but cannot penetrate lead, gold, or platinum.

Special: This modifier has a PL of 7 and will only be available in campaigns that allow FX or weird science.

Sonar

Purchase DC: 20
Invention Points (Craft electronics): 250
Effect: Your battlesuit has a built in sonar system allowing detection of objects and navigation at very deep depths without the use of sight. See the Listen skill for more information on the use of sonar. This use of the Listen skill may not be used untrained. Listen checks for sonar take a –10 penalty when not underwater.

Weaponry
(Advanced Armors Only)

Designing a weapon for a battlesuit is the same as designing a freestanding weapon. See weapon design.

Generic Weapon Mounts

Purchase DC: +9 wrist/hand, +12 shoulder/chest
Invention Points (Craft mechanical): +90 wrist/hand, +160 shoulder/chest
Effect: This modifier allows the creator to build a generic weapon mount that allows a weapon to be install at a later time. A wrist/hand mount can hold a medium or small weapon. A shoulder/cheat mount can hold a large or huge weapon.

Installing a weapon in this generic slot requires a Repair check (DC 20) and raw materials (DC 9). The range of the installed weapon remains unchanged.

Exoskeleton
(Advanced Armors Only)

Enhancing the strength of the wearer is another popular function of battlesuits. This device, known as an exoskeleton, can either be worn on its own (providing a strength bonus but little protection) or may be incorporated into a battlesuit.

Combining an Exoskeleton with Armor: When combining an Exoskeleton with armor, whatever type of armor it was (Light, Medium, or Heavy), it is now Powered armor. A character proficient in the armor, but not the exoskeleton, gains less of a strength bonus, but is otherwise able to use the armor normally.

For purposes of the Max Dex, Armor Penalty, and Speed, use whichever is worse, from the armor or exoskeleton. Exoskeletons can be made with the Lightweight Alloys modifier just as Armor can. Weight is cumulative, while the Purchase DC and Craft DC checks must both be made separately.

An exoskeleton can only be included in armor when it is first constructed. However, a character that has constructed

Table 2-9: Exoskeletons

Type	Strength Bonus	Nonproficient Bonus	Max Dex	Armor Penalty	Speed	Weight	Wealth DC	Invention Points (Craft mechanical)	Progress Level
Powered	+1	+1	+8	-0	30	2 lbs.	10	120	PL 6
Powered	+2	+1	+8	-0	30	2 lbs.	11	140	PL 6
Powered	+3	+1	+7	-0	30	4 lbs.	12	160	PL 6
Powered	+4	+2	+7	-1	25	4 lbs.	13	180	PL 7
Powered	+5	+2	+6	-1	25	6 lbs.	14	200	PL 7
Powered	+6	+2	+6	-2	25	6 lbs.	16	220	PL 7
Powered	+7	+3	+5	-2	20	8 lbs.	18	240	PL 8
Powered	+8	+3	+5	-3	20	8 lbs.	20	260	PL 8
Powered	+9	+3	+4	-3	20	10 lbs.	22	280	PL 9
Powered	+10	+3	+4	-4	20	10 lbs.	24	300	PL 9

a suit of armor and worked all the bugs out of it can make a new version of that armor with an exoskeleton, and he only needs to make craft checks on the exoskeleton portion of the item (so the armor will not have any more bugs than it did before).

Sample Armor

Following are some sophisticated suits of armor designed by the rules presented above.

All Terrain BioHazard Gear

This suit is designed to allow the wearer to function in areas of radioactivity and chemical contamination. It grants a +4 to saves vs. radiation, chemical contamination and disease. However it is difficult to maneuver in for long periods of time being bulky and stuffy (in addition to its normal penalties this armor's armor check penalty applies to saves to avoid environmental damage from heat and thirst).

Modifiers: Base (+160), Hazmat Protection x2 (+40), Air Supply x2 (+60), Bulky x2 (-20), Hot (-30)

Combat SCUBA

This lightweight suit might be found in the hands of an elite SEAL team or perhaps an elite search and rescue team for underwater cave rescues where space is at a premium. It has a 2-hour air supply and provides protection from cold water conditions (a +2 to saving throws to avoid environmental damage from cold) while remaining lightweight and streamlined. This armor requires a SCUBA license.

Modifiers: Base (+160), Air supply x2 (+60), Climate Controlled (cold) x2 (+40), Lightweight Alloys (+20), Added Restriction Level (-10)

Liquid Steel Armor

Currently in testing by the military, this liquid becomes as hard as steel when subjected to a sudden shock (such as a bullet impact). Cloth can be soaked in this fluid and gain this quality (such as the cloth depicted here). Military planners intend to use this substance to provide greater protection to political leaders and soldiers by soaking clothing worn over areas not protected by modern Kevlar (such as the arms and legs). Currently in research and development by the Department of Defense this material will only be supplied to those with a clear military reason for using it (perhaps special operations could be assigned to run this material through a shakedown phase to eliminate any problems with the material).

Modifiers: Base (+180), Lightweight Alloys x3 (+60), Added Restriction Level x3 (-30), Nonmetallic alloy (+20)

Jet Pack

The ultimate in combat mobility the jet pack allows a soldier so equipped to take to the air at speeds of up to 50 mph (90 feet per round). This prototype is extremely bulky and will be ditched in combat conditions. However the advantages this provides to forward scouts and special operations personnel are enormous.

Modifiers: Flight Rig (90 feet per round flight) (+280)

Table 2-10: Sample Armors

Armor	Type	Equipment/ Strength Bonus	Nonproficient Bonus	Max Dex	Armor Penalty	Speed	Weight	Purchase DC*	Invention Points	Materials Restriction
Hazmat Suit	Hvy	+3/+0	+1/+0	+1	-5	20	18 lbs.	13	210	---
Combat SCUBA	Light	+3/+0	+1/+0	+6	-0	30	6 lbs.	19	270	Lic.
Liquid Steel Armor	Light	+4/+0	+2/+0	+8	-0	30	2 lbs.	14	230	Mil.
Jet Pack	Hvy	+0/+0	+0/+0	+0	-6	20 (ground)	21 lbs.	28	280	PL 6
Atlas Mk I	Powered	+2/+2	+1/+1	+7	+0	30	6 lbs.	18	280	PL 6
Atlas Mk II	Powered	+5/+4	+2/+2	+4	-2	25	14 lbs.	23	380	PL 7
Atlas Mk III	Powered	+10/+10	+3/+3	+0	-7	20	34 lbs.	39	600	PL 9

* Purchase DC of materials

Table 2-11: Computer Hardware Desgin

Processor (Int)	Intelligence Modifier	Programs	Awareness	Invention Points (Craft electronic DC)	Wealth DC	Materials Restriction
2	-4	1	0%	20 (2)	1	---
4	-3	2	0%	30 (3)	2	---
6	-2	3	0%	40 (4)	3	---
8	-1	4	0%	50 (5)	4	---
10	+0	5	0%	60 (6)	5	---
12	+1	6	0%	80 (8)	6	---
14	+2	7	0%	100 (10)	7	---
16	+3	8	0%	120 (12)	8	---
18	+4	9	0%	140 (14)	9	---
20	+5	10	0%	160 (16)	10	---
22	+6	11	0%	200 (20)	11	Res.
24	+7	12	0%	240 (24)	12	Res.
26	+8	13	0%	280 (28)	13	Mil
28	+9	14	0%	320 (32)	14	Mil.
30	+10	15	0%	360 (36)	15	Mil.
32	+11	16	10%	400 (40)	16	PL 6
34	+12	17	20%	450 (45)	17	PL 7
36	+13	18	30%	500 (50)	18	PL 8
38	+14	19	40%	550 (55)	19	PL 9
40	+15	20	50%	600 (60)	20	PL 9

Atlas Mk I

This suit of armor might see use in as little as 10 years. Lightly armored and fast it allows scouts and special operations personnel the benefits of speed and stealth with an added strength-enhancing exoskeleton.

Modifiers: Base (+140), Exoskeleton +2 (+140)

Atlas Mk II

Currently a dream of military planners the Atlas may become a nightmarish reality in the next 10-20 years. Combining protection with a strength enhancing exoskeleton this armor will allow soldiers to bypass obstacles with ease and expect to win any hand-to-hand engagement.

Modifiers: Base (+200), Exoskeleton +4 (+180)

Atlas Mk III

The ultimate expression of the Atlas design one soldier in this armor might be worth 100 average soldiers, able to destroy heavy fortifications and overturn armored vehicles with his bare hands, a soldier in this armor would wreak havoc and dominate any battlefield he stood on.

Modifiers: Base (+300), Exoskeleton +10 (+300)

On Board Computers

A computer may be installed in any vehicle, robot or even a suit of clothing. A computer small enough to be considered on board can be accessed as a Free action. For a computer to be onboard it must be two size categories smaller than the place it is installed (if worn it must be two size categories smaller than the creature wearing it).

Computer Design

Computer Design is actually two completely separate areas: hardware design and software design. Each is covered in detail below. In most cases a character who simply desires a computer for research and data collection purposes will find a computer room (detailed under the Headquarters design rules) less complicated than building a computer from scratch under these rules. However for those with a desire for that little something special, read on.

Computer Hardware Design

Computer hardware is rated in three areas: processor speed, memory and size. Each contributes to the cost of the computer and the difficulty of constructing it.

Processor: A computer's processor is its Intelligence score. All computers must have an Intelligence of at least 2 to be able to function. A computer can run a number of programs equal to one-half its Intelligence score. Computers also use their Programs modifier as the basis for any skill programmed into the computer (meaning that "smarter" computers will tend to perform better).

Intelligence Modifier: A computer's Intelligence score determines two critical factors: the number of programs it can simultaneously run and its Intelligence bonus (or penalty).

Awareness chance: As computers become increasingly sophisticated there is a chance that they will begin to learn on their own. This phenomenon, found only in computers much more complex than those that can be built with current technology leads almost inevitably to self-awareness.

The percentage listed on the table is the chance each

Bundled Software

When you buy a computer (as opposed to building one yourself) you gain free software "bundled" with the purchased hardware. The wealth value of this software is equal to the price paid for the computer (1.5 times the purchase DC).

Table 2-12: Computer Memory

Memory Points	Invention Points (Craft electronic)	Purchase DC
5	10	1
10	20	2
15	30	3
20	40	4
25	50	5
30	90	6
35	105	7
40	120	8
45	135	8
50	200	10
55	220	12
60	240	14
65	260	16
70	280	18
75	300	20
80	400	22
85	425	24
90	450	26
95	475	28
100	500	30

month that the computer will become self-aware. At that point the computer's Wisdom and Charisma are randomly determined and the computer is treated as an NPC whose actions are determined by the game master not by the computer's creators.

Any Allegiances hard wired into the computer (see programs) will still be present and can help shape the computer's behavior. Also Artificially Intelligent computers always have an Allegiance to their creator. However, if this allegiance is not hardwired into the computer before it becomes self-aware the computer may change it at a later time.

Computer Memory

While the speed of a computer is important (as represented by the computer's Intelligence score) the sheer amount of data it can hold is equally important. Blood and Circuits represents this concept through Program Points, which work very similarly to skill points in a character.

Memory Points: Program Points are akin to skill points for a computer and are modified by the computer's Intelligence. Command programs cost a set number of Program Points, while Skill programs cost a number of Program Points equal to the skill modifier they provide.

Computer Size

Whoever said size matters wasn't kidding. Although in the world of computers smaller is better. Not only is there a race to make computers more powerful, but to make them smaller as well. Where this will ultimately lead is unclear, but many scientists feel the future of both computers and robotics is in nano-technology that will require machines (and computers to run them) to become the size of living cells.

Computer Hardware Modifiers

Dedicated Computer

Modifiers: -30 Invention Points (-3 Craft electronics DC); -3 Wealth DC

Purchase DC: -3

Invention Points (Craft electronics): -30 (-3)

Effect: The computer's programs must be set when the computer is constructed and can never be altered.

Table 2-13: Computer Size

Computer Size	Invention Points (Craft electronic)	Purchase DC	Material Restriction
Microscopic	+300	+12	PL 6
Fine	+200	+8	---
Diminutive	+100	+4	---
Small	+50	+2	---
Medium	+0	+0	---
Large	-50	-2	---
Huge or Larger	-150	-6	---

Computer Software Design

While the hardware of a computer is important, it is the software that makes a computer more than a paperweight. The hardware will determine how well a computer does what it does, while the software will determine what it can do.

Command Programs

Command programs allow a computer to take an action or follow a command. They are required for a computer to use a given skill or take a given action (since computers are not thinking beings they gain no skills that they may use untrained- however a computer with a command program but no skill program may operate within the realm of that program at its Intelligence modifier).

Creating programs is done through the use of the Computer Use skill. Programs have an Invention Point cost and a minimum Program Points requirement. If the computer does not have that many Program Points available the program cannot be installed unless another is erased. Computer programs never cost Wealth to create, writing code is free. However buying a program off the shelf will have a cost and this is listed as the program's purchase price.

Note that buying a computer program off the shelf is *no* guarantee it will be bug free.

Programs may have prototype modifiers that lead to bugs like any other program. If a computer has bugs whose penalties exceed the computer's Intelligence modifier the computer shuts down and must be restarted (requiring a full-round action). For example, a computer with an Intelligence of 12 (and thus an Intelligence modifier of +1) has a new program installed with a prototype modifier of 2. During the adventure the computer's autopilot program is turned on during battle so the vehicle's lone occupant can devote his attention to firing the vehicle's weapons. He rolls a natural 1 activating the computer's prototype modifier. The GM rules that the computer has interfered with the vehicle's fuel injector and, rolling a 3 on a d6, reduces the vehicle's speed by 30 feet per round. Since this also exceeds the computer's Intelligence modifier the computer crashes causing the unlucky PC to have to grab for the controls.

Antivirus, Basic
Memory Points: 2
Invention Points (Computer Use): 120
Purchase DC: 7
Effect: Any attempt to degrade the computer's programming has its DC increased by +5.

Antivirus, Average
Memory Points: 5
Invention Points (Computer Use): 150
Purchase DC: 10
Effect: Any attempt to degrade the computer's programming has its DC increased by +10. This also makes the computer immune to Basic Viruses.

Antivirus, Deluxe
Memory Points: 10
Invention Points (Computer Use): 200
Purchase DC: 15
Effect: Any attempt to degrade the computer's programming has its DC increased by +15. This also makes the computer immune to Average Viruses.

A computer with this program installed will also attempt to repair programming itself automatically if it has the Computer Use skill program installed.

Computer Use is added to the computer's skill list.

AutoNav
Memory Points: 5
Invention Points (Computer Use): 150
Purchase DC: 10
Effect: The computer may plot a course using the Navigate skill. If the craft also has a Deluxe Autopilot program the computer may execute that course itself. If the computer has an internet connection of average or better quality this program also provides GPS access, allowing the character to determine his exact location on a Navigate skill check (DC 10). This program adds Navigate to the computer's skill list.

Autopilot, Basic
Memory Points: 5
Invention Points (Computer Use): 150
Purchase DC: 10
Effect: Computer may pilot craft out of combat. When this program is created or purchased the character must specify one class of air or ground vehicle that the autopilot will operate on. This program will not operate on a different type of vehicle.

Autopilot, Deluxe
Memory Points: 10
Invention Points (Computer Use): 200
Purchase DC: 15
Effect: Computer may pilot craft in combat. Pilot or Drive (chosen when program is purchased or created) is added to the computer's skill list.

Combat Program, Basic
Memory Points: 5
Invention Points (Computer Use): 150
Purchase DC: 10
Effect: This program allows the computer to attack using any means at its disposal (weapons or perhaps a slam attack). The computer must be ordered to attack and given a target (requiring an attack action from an authorized person).

A computer with this program gains a BAB bonus of +0.

A robot with this program gains a BAB equal to ½ its hit dice (it uses the slowest progression).

Computer attacks are modified by the computer's Intelligence modifier. Robot attacks are modified by the robot's Strength or Dexterity modifiers.

Combat Program, Average
Memory Points: 10
Invention Points (Computer Use): 200
Purchase DC: 15
Effect: This program allows the computer to attack using any means at its disposal (weapons or perhaps a slam attack). The computer may be given a queue of targets as a single order (requiring an attack action from an authorized person).

A computer with this program gains a BAB bonus of +3.

A robot with this program gains a BAB equal to ¾ its hit dice (it uses the medium progression).

Computer attacks are modified by the computer's Intelligence modifier. Robot attacks are modified by the robot's Strength or Dexterity modifiers.

Combat Program, Deluxe
Memory Points: 20

Invention Points (Computer Use): 300
Purchase DC: 25
Effect: This program allows the computer to attack using any means at its disposal (weapons or a slam attack for robots). The computer may be given a queue of targets as a single order (requiring an attack action from an authorized person). The computer may also make its own decisions on who to attack if left to its own devices (use the computer's Knowledge (tactics) skill to determine how intelligently it accomplishes this). For example a computer could be told to guard a certain area from unauthorized personnel.

A computer with this program gains a BAB of +5.

A robot with this program gains a BAB equal to its hit dice (it uses the fast progression).

Computer attacks are modified by the computer's Intelligence modifier. Robot attacks are modified by the robot's Strength or Dexterity modifiers.

This program adds Knowledge (tactics) to the computer's skill list.

Command Directive

Memory Points: 2
Invention Points (Computer Use): 120
Purchase DC: 7
Effect: This program puts inhibitions on a computer's behavior, effectively giving a computer an Allegiance. However unless the computer is sentient this allegiance will be followed mindlessly. A command directive could be to follow commands from a certain level of identity card or follow verbal commands from a specific person. A computer must have a visual recognition or data reader program to identify a security card. A computer must have visual or voice recognition to identify an individual.

Note that a computer, even a sentient one cannot change a command directive programmed into it before the time the computer becomes self-aware. This can make a command directive a powerful, perhaps essential tool for controlling artificially intelligent computers.

However once a computer becomes self-aware command directives may not be installed.

Crime Database

Memory Points: 2
Invention Points (Computer Use): 120
Purchase DC: 7 (Res. +2)
Effect: The computer can aid in the analysis of a clue. This program adds Investigate to the computer's skill list. If this computer also has an internet connection a Research check may also be used to find out if any fingerprints found match suspects in other crimes, as well as provide criminal histories for any potential suspects. Use of programs like this one are restricted to law-enforcement personnel since criminals could alter records found in criminal databases to cover their tracks.

Data Reader

Memory Points: 1
Invention Points (Computer Use): 110
Purchase DC: 6
Effect: This program allows a computer to identify an individual through swiping a card and/or inputting a personal identification number (commonly referred to as a PIN). Whether the system requires both the card and a PIN or just the card is decided when the system is installed.

A computer with this installed requires both a Computer Use *and* a Forgery skill check to bypass security.

Decryption

Memory Points: 10
Invention Points (Computer Use): 200
Purchase DC: 15 (Mil. +3)
Effect: This program will attempt to unscramble any transmission it receives. This program adds Computer Use to the computer's skill list.

Early Warning System

Memory Points: 10
Invention Points (Computer Use): 200
Purchase DC: 15 (Res. +2)
Effect: This program will allow a computer to monitor radar arrays, warning of intruding aircraft. This program adds Spot to the computer's skill list and allows those ranks to be used for Radar Operation.

Electronic Warfare

Memory Points: 10
Invention Points (Computer Use): 200
Purchase DC: 15 (Mil. +3)
Effect: This program will allow a computer to make Computer Use checks for Jamming, Signal Interception and Signal Triangulation. This program adds Computer Use to the computer's skill list.

Encryption

Memory Points: 10
Invention Points (Computer Use): 200
Purchase DC: 15 (Mil. +3)
Effect: This program will automatically scramble any transmission made through the computer in question. This program adds Computer Use to the computer's skill list and allows those ranks to be used for scrambling a signal.

Internet Connection, Basic

Memory Points: 1
Invention Points (Computer Use): 110
Purchase DC: 6
Effect: Character can communicate in very basic ways (e-mail and text messaging) through his computer.

Internet Connection, Average

Memory Points: 2
Invention Points (Computer Use): 120
Purchase DC: 7
Effect: Character can communicate through e-mail and voice through his computer. You may also conduct research through your computer even if you are in the field. Computer searches (Research checks) take the usual time to perform. You may also use a computer so equipped to make Computer Use checks for hacking or to give commands to another computer that also contains this program regardless of your location.

Internet Connection, Deluxe

Memory Points: 5
Invention Points (Computer Use): 150
Purchase DC: 10
Effect: As above except all forms of communication are possible. You may also make Research checks in half the time and any hacking attempt made by you gains a +2 bonus.

Photographic Storage, Basic

Memory Points: 1
Invention Points (Computer Use): 110
Purchase DC: 6
Effect: The computer may store one minute of visual data (the information gained from any program requiring or using the Spot skill) for each memory point devoted to photographic storage.

Photographic Storage, Average

Memory Points: 2
Invention Points (Computer Use): 120
Purchase DC: 7
Effect: The computer may store ten minutes of visual data (the information gained from any program requiring or using the Spot skill) for each memory point devoted to photographic storage.

Photographic Storage, Deluxe

Memory Points: 5
Invention Points (Computer Use): 150
Purchase DC: 10
Effect: The computer may store one hour of visual data (the information gained from any program requiring or using the Spot skill) for each memory point devoted to photographic storage.

Reconnaissance

Memory Points: 5
Invention Points (Computer Use): 150
Purchase DC: 10
Effect: The computer may make Spot checks for reconnaissance purposes. Spot is added to the computer's skill list.

Security, Basic

Memory Points: 2
Invention Points (Computer Use): 120
Purchase DC: 7
Effect: The DC to bypass the computer's security is increased by +5

Security, Average

Memory Points: 5
Invention Points (Computer Use): 150
Purchase DC: 10
Effect: The DC to bypass the computer's security is increased by +10

Security, Deluxe

Memory Points: 10
Invention Points (Computer Use): 200
Purchase DC: 15
Effect: The DC to bypass the computer's security is increased by +15
A computer with this program installed will also attempt to defend its security automatically if it has the Computer Use skill program installed.
Computer Use is added to the computer's skill list.

Virus, Basic

Memory Points: 2
Invention Points (Computer Use): 120
Purchase DC: 7 (Ill. +4)
Effect: Program will destroy 1-6 Memory Points in the infected computer. These Memory Points may be restored through a successful Computer Use check (DC 10+ the number of Memory Points destroyed).

Virus, Average

Memory Points: 5
Invention Points (Computer Use): 150
Purchase DC: 10 (Ill. +4)
Effect: Program will destroy 2-12 Memory Points in the infected computer. These Memory Points may be restored through a successful Computer Use check (DC 10+ the number of Memory Points destroyed).

Virus, Deluxe

Memory Points: 10
Invention Points (Computer Use): 200
Purchase DC: 15 (Ill. +4)
Effect: Program will destroy 3-18 Memory Points in the effected computer. These Memory Points may be restored through a successful Computer Use check (DC 10+ the number of Memory Points destroyed).

Virus, Self-replicating

Memory Points: +5
Invention Points (Computer Use): +50
Purchase DC: +10 (Ill. +4)

Effect: This program modifies another virus. The program will replicate itself every 4-24 (4d6) hours until it is successfully removed. If the computer has an internet connection a virus with this modifier will attempt to spread to other computers in contact with the infected computer.

Virus, Trojan Horse

Memory Points: 10
Invention Points (Computer Use): 200
Purchase DC: 10 (Ill. +4)

Effect: This program allows a remote user to control the infected computer. It is not very useful unless the computer is connected to the internet however, since that means the virus must be delivered manually, but also that the person wishing to control the computer must have a direct connection. However if the computer is connected to the internet this virus will allow the person who infected the computer to access it from any internet-connected computer.

Visual Recognition, Average

Memory Points: 2
Invention Points (Computer Use): 120
Purchase DC: 7

Effect: Computer may make spot checks. This allows simple transmission of video, and also allows a computer to move according to its surroundings, avoiding running into walls and such. Any attempt to use this video feed for reconnaissance purposes takes a –4 to the computer's skill check. Spot is added to the computer's skill list.

A computer with this program also requires both a Computer Use *and* a Disguise check to bypass security.

Note: This program is a requirement for many other programs such as command directives and combat programs.

Voice Recognition, Average

Memory Points: 2
Invention Points (Computer Use): 120
Purchase DC: 7

Effect: The computer may be voice activated and will respond to voice commands. If the computer fails a Listen skill check (DC 15) it misinterprets the order or does nothing (50% chance of each). Listen is added to the computer's skill list. This program allows a computer with a command directive program to respond to voice commands.

A computer with this program also requires both a Computer Use *and* a Bluff skill check to bypass security.

Skill Programs

Skill programs allow a computer to access its own skills if the computer has the proper command program. If the program has the proper command program it may be able to use this skill itself. Otherwise the skill is treated as a cross-class skill (the skill's ranks are halved) and the computer may not use the skill itself.

Rather a skill program without a command program may aid a character with that skill. A character using a program to aid a skill check gains half the computer's ranks in that skill as an equipment bonus. However a character may not gain more of a bonus than he has ranks in the skill.

Example: A computer with an AutoNav command program has 6 ranks in Navigate. It is able to make Navigate skill checks at 6 plus the computer's Intelligence modifier and plot a course itself. The operator would enter the destination and the computer would attempt to reach it. If the computer had the same +6 Navigate program but did not have the AutoNav command program it would be able to provide a user with 3 or more ranks in Navigate a +3 equipment bonus to Navigate skill checks.

Skill Program

Program Points: Varies (equal to the number of ranks)
Invention Points (Computer Use): 100+20 per skill rank (2 per skill rank)
Purchase DC: 2 per skill rank

Effect: Computer gains a number of ranks in a given skill.

Sample Computers

Following are some computers designed by the rules presented above.

Desktop, Basic

The state of the art… when a 486 was state of the art. The only reason to have one of these is if you can't afford anything else. In fact that could be considered the "advantage" of a little piece of history like this: the fact that you can get one at a garage sale.

Modifiers: Processor (+30), Memory (+20)

Desktop, Modern

A typical computer found in thousands of offices, businesses and homes. This computer is serviceable just don't ask (or expect) too much of it.

Modifiers: Processor (+60), Memory (+40)

Desktop, Advanced

The state of the art… for today. A good solid computer for the wannabe cracker, the best way to insure its obsolescence is to buy one.

Modifiers: Processor (+100), Memory (+90)

Laptop, Basic

This computer isn't that good. But at least it's easy to throw out the window when you get tired of it.

Modifiers: Processor (+30), Memory (+20), Small (+50)

Table 2-14: Sample Computers

Computer	Processor	Intelligence Mod.	Programs	Memory Points	Size	Invention Points (Craft electronic)	Purchase DC	Restriction
Desktop, Basic	4	-3	2	7	Med.	50	4	---
Desktop, Modern	10	0	5	20	Med.	100	9	---
Desktop, Advanced	14	+2	7	32	Med.	190	13	---
Laptop, Basic	4	-3	2	7	Small	100	6	---
Laptop, Modern	10	0	5	20	Small	150	11	---
Laptop, Advanced	14	+2	7	32	Small	240	15	---
Handheld, Basic	2	-4	1	1	Dim.	130	6	---
Handheld, Modern	8	-1	4	9	Dim.	160	9	---
Handheld, Advanced	12	+1	6	16	Dim.	190	11	---
Supercomputer, Basic	20	+5	10	45	Large	230	16	---
Supercomputer, Modern	24	+7	12	67	Huge	350	20	Res.
Supercomputer, Advanced	30	+10	15	85	Huge	510	29	Mil.
Backpack Radio	14	+2	7	62	Med.	310	21	Mil.

Laptop, Modern

A nice computer with some power and the advantages of portability.

Modifiers: Processor (+60), Memory (+40), Small (+50)

Laptop, Advanced

Powerful and portable, if you plan to do a lot of computing on the fly this might be the model for you.

Modifiers: Processor (+100), Memory (+90), Small (+50)

Handheld, Basic

Not a lot of power, but what do you want for a computer that will fit in your pocket?

Modifiers: Processor (+20), Memory (+10), Diminutive (+100)

Handheld, Modern

A little better, but still its most desirable feature is its size.

Modifiers: Processor (+50), Memory (+10), Diminutive (+100)

Handheld, Advanced

Very portable and with a little computing power to boot. A nice combination for those covert activities, or to impress the chicks at the internet café in the mall.

Modifiers: Processor (+80), Memory (+10), Diminutive (+100)

Supercomputer, Basic

Basic is a relative thing. A very large company might use one of these to store a *lot* of data and run a modest sized network. Many supercomputers of this class are years old and are "hand me downs" from large companies and science labs that have traded up to the next generation of supercomputer.

Modifiers: Processor (+160), Memory (+120), Large (-50)

Supercomputer, Modern

For enormous companies or science labs that need a computer able to process enormous amounts of data and run many programs simultaneously.

Modifiers: Processor (+240), Memory (+260), Huge (-150)

Supercomputer, Advanced

People with computers like these tend to be too cool to go by their names, preferring their initials: CIA, IBM, JPL and NASA would be a few of the kids with these ultimate toys.

Modifiers: Processor (+360), Memory (+300), Huge (-150)

Backpack Radio

The sort of radio one would find on the back of a special operations communications specialist. Get caught with one of these bad boys (especially a homemade version) and you better have a really good story to tell to avoid making little rocks out of big rocks at Fort Leavenworth. *Programs:* Encryption, Decryption, AutoNav, Deluxe Internet Connection, Electronic Warfare, Skill (Computer Use) +20

Modifiers: Processor (+100), Memory (+240), Dedicated Computer (-30)

Headquarters Design

Everyone needs a place to crash, whether hero or villain, but some fictional characters take the need to have a place for their stuff to the next level: Headquarters. Depending on your style (and budget), an HQ could range from a safehouse in Hell's Kitchen to a posh manor in Manhattan to a cave hidden underground.

Modular Headquarters Design

Like all the gadget design rules presented in this book, Headquarters design is handled with a modular system. What this means is that you pick and choose from certain items, like an a la carte menu, until you have the HQ you

Table 2-15: Headquarters Walls

Hardness	Hit Points	Purchase DC	Invention Points (Craft structural)	Break DC
0	10	5	50	10
1	12	6	60	12
2	14	7	70	14
3	16	8	80	16
4	18	9	90	18
5	20	10	100	20
6	22	11	110	22
7	24	12	120	24
8	26	13	130	26
9	28	14	140	28
10	30	15	150	30
12	34	16	160	34
14	38	17	170	38
16	42	18	180	42
18	46	19	190	46
20	50	20	200	50

want. Each item you pick has a cost and craft DC attached to it and certain feats (most notably the Lair feat) can make it easier to lay your hands on the really good stuff.

Walls: Since ancient times, the first line of defense for a location has been a wall. An HQ might have a large, imposing wall out front for all to see, or it might appear to be an unimposing Greenwich Village loft that uses magic to render the walls indestructible.

Hardness: This determines how resistant the wall is to force from a strictly materials standpoint.

Any character can make a spot skill check (DC 10) to determine the approximate hardness of a wall within 1 or 2 points. This check gains a +1 bonus per hardness of the wall in question, meaning that the approximate hardness of a 9 hardness or better wall is always noticeable.

Hit Points: This assumes the wall is 6 inches thick. A character can have thicker walls (increasing the hit points) by purchasing the modifier listed below. Once a wall has lost half its hit points, then the Break DC goes down by five.

Purchase DC: The raw materials cost. The cost is for one room. Raise the purchase DC by +2 for each additional room covered.

Invention Points: The base Invention Points (Craft structural).

Break DC: This is the Strength check necessary to put a hole in the wall big enough for a character to walk through. This DC is reduced by five if the wall has lost half its hit points.

Wall Modifiers

Additional Rooms

Purchase DC: +2

Invention Points (Craft structural): +20

Effect: Wall hardness and hit points cover an additional room of your HQ, this may be purchased multiple times.

Concealed

Purchase DC: +1

Invention Points (Craft structural): +10

Effect: Spot check needed to determine hardness of walls (DC 15). May be purchased multiple times raising the DC by +1 each time.

Hardened

Purchase DC: +1

Invention Points (Craft structural): +10

Effect: +1 Hardness, may be purchased multiple times.

Reinforced

Purchase DC: +2

Invention Points (Craft structural): +20

Effect: +5 Hit Points, may be purchased multiple times.

Security Systems

To further deter unwanted guests, a character can install security prevention devices, from the simplest of locks and cameras to the most sophisticated retina scanners. These devices make it more difficult for a character's headquarters to be broken into, and make surprising him that much harder.

Evasion DC: This determines how hard it is to bypass the security system in question. A Disable Device skill check at the listed DC will always disable the security measures in place, but will leave evidence that can be tracked later. Depending on the type of security the headquarters has installed, the system may also be bypassed without leaving evidence by one skill check of the character's choice, at the listed DC +5. So a retina scanner could be bypassed by a Disguise check, a card-reader system by a Forgery check, and so forth. Any skill that meets with the GM's approval can be used, and creativity is to be encouraged.

Spot DC: This is the Spot check required to notice the security measures in the first place, when a would-be intruder is casing out your HQ. If this check is failed, then the intruder cannot attempt to evade your security measures, since he didn't notice them in the first place.

Purchase DC: The raw materials cost.

Invention Points: The base Invention Points (craft electronic).

Rooms

Although Walls and Security Systems are nice, rooms are what having a base of operations is all about. From a place to rest a weary head to the most sophisticated crime lab imaginable, rooms allow an HQ to be an asset in your adventures. All rooms come in three varieties, Spartan, Average, and Deluxe, with a corresponding increase in price and construction difficulty. If you do not wish to, or do not have the appropriate skill, to build a room yourself, you can hire others to do the work, adding half the Craft DC to the wealth check required to purchase the room.

Table 2-16: Security Systems

Evasion DC	Spot DC	Purchase DC	Invention Points (Craft electronic)
10	5	5	50
12	10	6	60
14	15	7	70
16	20	8	80
18	22	9	90
20	24	10	100
22	26	11	110
24	28	12	120
26	30	13	130
30	35	15	150

Communications Room

Purchase DC: 18/23/28

Invention Points (Craft electronics): 180/230/280
Spartan Communications Rooms allow broadcast and reception on police, ham, and citizens band radio frequencies. Average Communications Rooms allow broadcast and reception on military and television frequencies and also allow operators trained in the Computer Use skill to perform Jamming, Transmission Interception and Transmission Triangulation checks. Deluxe Communications Rooms grant a +4 to all Computer Use checks and allow characters trained in the Compute Use skill to perform Scramble/Unscramble Transmission checks. If the HQ also has a Computer Room, apply the bonus it grants to Computer Use skill checks to all Cryptography skill checks as well.

Computer Room

Purchase DC: 15/20/25

Invention Points (Craft electronics): 130/180/230
Spartan Computer Rooms allow Research checks to be made from your HQ, but the time is 3-6 hours, instead of the usual 1-4. Average Computer Rooms allow Research checks to be made at +2 in 1-2 hours, and Deluxe Computer Rooms allow Research checks at +4 to be made in 1 hour. Computer Rooms also grant a +1, +2, or +5 to Computer Use rolls, including rolls for hacking.

Crime Lab

Purchase DC: 15/18/23

Invention Points (Craft mechanical): 130/150/200
Spartan Crime Labs allow the Investigate skill to be performed to analyze clues with no penalty. Average Crime Labs grant a +2 to this check, and Deluxe Crime Labs grant a +5. If you also have an Average Computer Room, you gain an additional +1 on Investigate checks, while Deluxe Computer Rooms grant an additional +2 bonus.

Living Quarters

Purchase DC: 12/15/20
Invention Points (Craft structural): 80/100/120

The only differences between living quarters of different qualities are their relative style and comfort.

Medical Ward

Purchase DC: 12/18/25

Invention Points (Craft mechanical): 100/160/230
Spartan Medical Wards provide an extra bed, a first aid kit, some field surgery tools, and a sterile environment. Treat Injury checks gain a +1 bonus for all aspects of the skill except performing Surgery. Surgery checks may be performed at no penalty, but gain no bonus. Average Medical Wards grant a +3 bonus to all aspects of the Treat Injury skill, and a Deluxe Medical Ward grants a +4, in addition to increasing any roll to restore hit points (either through the Restore Hit Point or Surgery applications of this skill) by +1 per die. Deluxe Medical Wards increase long-term care gains to 4 hit points or 4 ability points per day, and allow a character to apply long term care to 1.5 patients per skill rank in Treat Injury.

Radar Room

Purchase DC: 15/18/23

Invention Points (Craft electronics): 150/180/230
A Spartan Radar Room allows the use of the Spot skill for radar detection to a range of 10 miles. An Average Radar Room grants a +2 bonus on Spot checks for radar and has a range of 100 miles. A Deluxe Radar Room grants a +4 bonus on Spot checks for radar and has a range of 500 miles.

Vehicle Bay

Purchase DC: 15/18/23

Invention Points (Craft mechanical): 130/160/210
Vehicle Bays grant a +1, +2, or +5 bonus on Craft (mechanical) checks, respectively. This room can hold 2, 4, or 8 medium vehicles (or half this number of large vehicles-this means that a Spartan vehicle bay cannot hold a Huge vehicle) at a time as well, for either storage or repair. The Deluxe Vehicle Bay reduces the wealth DC of any Craft (mechanical) check by 2 and allows Craft checks to be made more often (move one step up the Craft table for how often a character may roll).

Robot Design

Robots have developed from scientific oddities to manufacturing aids and finally to weapons of war and law-enforcement. Most modern robots are small and used for spying or bomb removal/disarming. However, in the future robots may take a more active role in war.

Robots share some of the characteristics of humans and some of the characteristics of machines. Robots are armored like a humanoid (using a Defense value rather than hardness) however they gain bonus hit points based on their size. Robots may be built with a bipedal frame that allows them to

Table 2-17: Armature Robot Frames (PL 5)

Robot Size	Base HD	Bonus HP	Str	Dex	Max HD	Invention Points (Craft mechanical)	Purchase DC
Colossal	32d10	120	47	6	64d10	440	29 +2 per HD beyond 32
Gargantuan	16d10	80	39	6	31d10	360	24 +2 per HD beyond 16
Huge	8d10	40	31	6	15d10	280	18 +1 per HD beyond 8
Large	2d10	20	23	8	7d10	240	16 + ½ per HD beyond 2
Medium	1d10	10	15	10	---	200	13
Small	1/2d10	5	11	12	---	160	11
Tiny	1/4d10	---	7	14	---	120	8
Diminutive	1/8d10	---	5	16	---	80	5
Fine	1/16d10	---	1	18	---	40	3

walk and use weapons built for humanoids (small arms for example), or they may be built like a vehicle, allowing them to move like a vehicle and attack using vehicle-mounted weapons.

Modular Robot Design

1. Robot Endoskeleton
2. Robot Control
3. Robot Armor (optional)
4. Robot Movement (optional)

Robot Endoskeleton

The first step in robot construction is to choose a frame on which the rest of the robot will be built. This is called an endoskeleton.

Size: The robot's size category.

Base HD: The minimum number of HD for the robot.

Bonus HP: This represents the bonus HP a robot receives for its size category.

Str/Dex: The Strength and Dexterity for a robot of that size. In addition all robots have a Wisdom of 10 and a Charisma of 1.

Maximum HD: The maximum HD a robot of that size may have. This increases the Wealth DC required to build the robot by the listed amount.

Invention Points (Craft mechanical): The amount of Invention Points it will take to build a robot of that size.
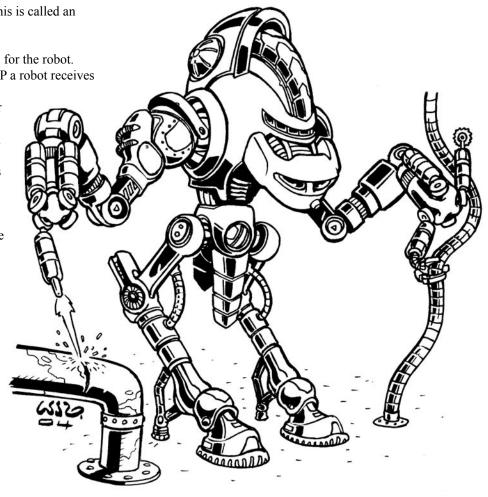
Purchase DC: The materials cost of a robot of that size.

Robot Control

Without a source of control both a huge powerful warbot and a small silent spydrone are useless. There are three main ways to control a robot: remote control, computer control, or through a human pilot. Each is covered below.

Remote Control

The simplest method of controlling a robot is through remote control by a human operator. This is one of the most effective means of control since a human can react intelligently in situations that would confuse the most sophisticated computer. However a remote control requires a human operator to make all decisions which is often not desirable in terms of manpower or in the course of a long, routine mission where a human operator will make mistakes through sheer boredom. This is why interstellar probes use computer control during their decades long space flights even if they will conduct experiments under remote control once they arrive at their destination.

Basic Remote Control Link

Purchase DC: +1
Invention Points (Craft electronic): 10

This set up includes a grainy black and white video link (-4 penalty on all Spot checks for the human operator) to allow the operator to see what is happening in the immediate vicinity.

When the operator gives the robot an order, he takes a full round action to input the order by keyboard. The robot may then take a partial action (either move or attack).

Modern Remote Control Link:

Purchase DC: +2
Invention Points (Craft electronic): 20

This set-up includes a sharp black video link (-2 penalty to Spot checks for the human operator) to allow the operator to see what is happening in the immediate vicinity.

When the operator gives the robot an order he takes an attack action to input the order by joystick in real time allowing the robot to take up to a full-round action including an attack action and a move action.

Advanced Remote Control Link

Purchase DC: +5
Invention Points (Craft electronic): 50

(Materials have Military restriction and the Wealth cost is raised by +3 if these materials are purchased on the black market).

This set-up includes a sharp color video link (no penalty to Spot checks) to allow the operator to see what is happening in the immediate vicinity.

When the operator gives the robot an order he takes a move action to input the order by joystick in real time allowing the robot to take up to a full-round action including an attack action and a move action. This link is instantaneous via laser satellite transmission and grants the robot an initiative bonus equal to the Dexterity modifier of its human operator (though the robot's Dexterity modifier also applies).

Computer Control

Computer control offers some unique advantages and disadvantages in the control of a robot. For lengthy or monotonous tasks a robot operator will never get bored, never call in sick and never miss an appointment. For long interstellar space flights where nothing happens for years and then a precise course correction must be made in seconds or the grinding monotony of producing automobiles with precision to avoid defects computer control is ideal. However, computers are not truly capable of intelligent thought (not yet) and so on all but the simplest missions a remote control link might still be desirable.

A computer built to control a robot operates under the same rules as any other computer a character might wish to build. See the section on building and programming computers for more information.

The only restriction is that a computer must be two sizes smaller than the robot it is installed in.

Robot Armor

Adding armor to a robot is done in the same manner as building a suit of armor a character would wear. However robots have access to some armor modifiers that their human counterparts would not have access to, and these are listed below.

Integrated Armor

Purchase DC: +5
Invention Points (Craft mechanical): +50

Effect: The robot's armor is part of it and may not be removed or upgraded (the armor is simply a hardening of the robot's exterior that can only be performed upon construction). The robot may not wear armor of any kind to further enhance its defense but the robot suffers no maximum Dexterity bonus or armor check penalties for this integrated armor.

Robot Movement

Robots can be designed to operate in a variety of environments. In fact exploring hazardous terrain is one of the prime uses for robots. A robot must have a movement mode for each terrain it wants to move in.

Forced Air

Purchase DC: ½ the robot's frame cost
Invention Points (Craft mechanical): ½ the robot's frame cost
Base Speed: Fly 30 ft. (clumsy)

Legs (Multiple)

Purchase DC: ½ the robot's frame cost
Invention Points (Craft mechanical): ½ the robot's frame cost
Base Speed: 30 feet (robot can negotiate stairs and other obstructions at ½ speed)

Propeller (Air)

Purchase DC: ¼ the robot's frame cost
Invention Points (Craft mechanical): ¼ the robot's frame cost
Base Speed: Fly 40 ft. (clumsy), if robot moves below base speed it falls.

Propeller (Water)

Purchase DC: ¼ the robot's frame cost
Invention Points (Craft mechanical): ¼ the robot's frame cost
Base Speed: Swim 20 ft.

Table 2-18: Robot Manipulators

Manipulator	Dim.	Tiny	Small	Medium	Large	Huge	Gargantuan	Colossal
Claw	1	1d2	1d3	1d4	1d6	1d8	2d6	2d8
Pincer	---	1	1d2	1d3	1d4	1d6	1d8	2d6
Probe	---	---	1	1d2	1d3	1d4	1d6	1d8
Special-Use Gripper	---	1	1d2	1d3	1d4	1d6	1d8	2d6

Rotor

Purchase DC: ¼ the robot's frame cost
Invention Points (Craft mechanical): ¼ the robot's frame cost
Base Speed: Fly 30 ft. (Poor), a robot with this modifier can hover.

Stationary

Purchase DC: None
Invention Points (Craft mechanical): None
Base Speed: None.

Track

Purchase DC: 1/10 the robot's frame cost
Invention Points (Craft mechanical): 1/10 the robot's frame cost
Speed: 10 feet (robot can only follow a set track)

Treads

Purchase DC: ¼ the robot's frame cost
Invention Points (Craft mechanical): ¼ the robot's frame cost
Base Speed: 20 feet (no terrain penalties to movement, cannot climb stairs)

Wheels

Purchase DC: ½ the robot's frame cost
Invention Points (Craft mechanical): ½ the robot's frame cost
Base Speed: 30 ft. (half speed over rough terrain)

Robot Manipulators

A robot needs manipulators to lift or manipulate objects. They can also allow the robot to attack.

Claw

Purchase DC: 10 + ¼ the robot's frame cost
Invention Points (Craft mechanical): 10 + ¼ the robot's frame cost
Damage: Lethal slashing or bludgeoning (based on size, see below); robot takes a –4 on any task that involves manual dexterity

Pincer

Purchase DC: 5 + ¼ the robot's frame cost
Invention Points (Craft mechanical): 5 + ¼ the robot's frame cost
Damage: Lethal piercing or non-lethal bludgeoning

Probe

Purchase DC: 5 + ¼ the robot's frame cost
Invention Points (Craft mechanical): 5 + ¼ the robot's frame cost.
Damage: Lethal piercing or nonlethal bludgeoning (this device cannot manipulate objects at all and is usually a thermometer or other measuring device)

Special-Use Gripper

Purchase DC: 5 + 1/10 the robot's frame cost
Invention Points (Craft mechanical): 5 + 1/10 the robot's frame cost
Damage: Nonlethal bludgeoning (can perform the task it was designed for without penalty, all other tasks suffer a –4 penalty)

Robotic Sensors

Class I Sensors

Purchase DC: 9
Invention Points (Craft electronic): 200
Effect: Basic audio and visual reception- robot takes a –4 on all Demolitions, Disable Device, Forgery and Repair checks and a –2 on all other skill checks.

Class II Sensors

Purchase DC: 10
Invention Points (Craft electronic): 250
Effect: Audio and infrared visual sensors, audio sensors and airborne sensors- robot takes a –4 on all Demolitions, Disable Device, Forgery and Repair checks

Table 2-19: Sample Robots

Robot	Size	HD	Bonus HP	Str.	Dex.	Def.	Movement	Invention Points (Craft mechanical)	Purchase DC	Restriction
Spydrone, Mk I	Small	½d10	5	11	12	11	40 Air (Clumsy)	400	42	Mil.
Spy Satellite	Large	2d10	20	23	8	9	None	880	84	Mil.
Bomb Squad Bot	Small	½d10	5	11	12	11	30 Ground	281	36	Lic.

Class III Sensors
Purchase DC: 11
Invention Points (Craft electronic): 300
Effect: More advanced audio, visual and olfactory sensors- no penalty on skill checks.

Sample Robots
Following are some pre-created robots using these rules.

Spydrone Mk I
A remote control spy plane, complete with a camera for taking pictures of enemy troop movements. Later versions of these drones are armed with a pair of .50 caliber machine guns to take out any "targets of opportunity".

Features: Small (+160), Modern Remote Control Link (+20), Propeller (+40), Computer (Int 2, Memory 26, Size Dim, Programs: Reconnaissance, Average Photographic Storage, Skill (Spot +6), 9 memory for 90 minutes of photographic storage, Dedicated Computer) Processor (+20), Memory (+90), Diminutive (+100), Dedicated (-30)

Spy Satellite
An older spy satellite, launched into orbit over a particular location. Although it possesses rockets to maintain its orbit it would take this satellite quite awhile to be moved to a new location (assume a several days to a week under normal circumstances).

Features: Large (+240), Computer (Int 16, Memory 103, Size Small, Programs: AutoNav, Deluxe Autopilot, Deluxe Photographic Storage, Reconnaissance, Deluxe Visual Recognition (Identification Codes), Skill (Spot +50), 33 memory for 33 hours of photographic storage, Dedicated Computer) Processor (+120), Memory (+500), Small (+50), Dedicated (-30)

Bomb Squad Bot
This small robot has a manipulator arm and camera, allowing bomb squad experts to move and defuse explosives in safety.

Features: Small (+160), Modern Remote Control link (+20), Wheels (+80), 1 Special-Use Gripper (Disable Device) (+21)

Vehicle Design

Vehicles can be a way to get somewhere quickly, a home, a weapon of war or all of these. While this can make a vehicle a very expensive proposition their value cannot be questioned.

Modular Vehicle Design
1. Vehicle Body
2. Vehicle Armor (optional)
3. Vehicle Movement and Movement Modes
4. Vehicle Weapons (optional)

Vehicle Body
A vehicle's body determines the amount of crew required to operate it, and how much cargo a vehicle can carry.
Size: The vehicle's size.
Crew: Only one-quarter of the crew number is needed to pilot a vehicle, with a minimum of one pilot at all times. Remaining crew space can be used for passengers, but is typically used to operate vehicle-mounted weapons.
Initiative and Maneuver: The modifier to Pilot initiative and skill checks. The maneuver column also lists a movement penalty. When designing a vehicle of the listed size you must buy at least 10 feet per round more movement than this or the craft will not move. This penalty also applies to the Class Defense Bonus that a skilled pilot may add to a craft.
Hardness: The vehicles hardness. Subtract that number from any damage dealt to the vehicle.
Hit Points: The vehicles full normal hit points.
Defense: The vehicles Defense.
Purchase DC: The price of the body style.
Invention Points: The Craft (structural) Invention Points needed to build the body at the listed price.
Example: An example craft of that size.

Vehicle Body Modifiers

Passenger Space
Purchase DC: +1 (may be purchased multiple times as long as craft has at least 250 lbs. of cargo remaining)
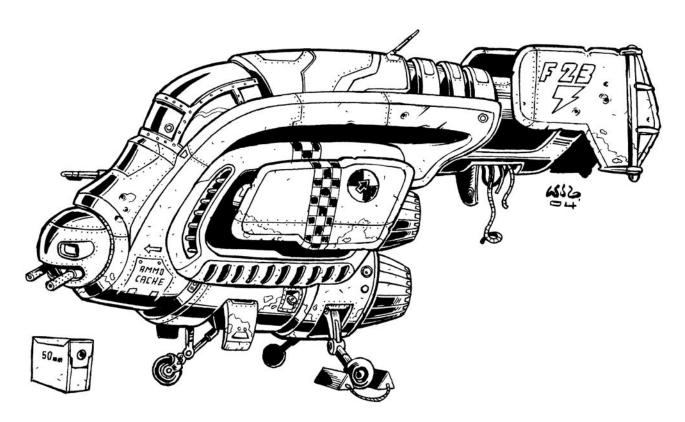**Invention Points (Craft structural):** 20
Effect: Vehicle's passenger rating increases by one. If the vehicle has passenger space that is unused it may still use some of this space for cargo, though not as much. Add 100 lbs of cargo for each unused passenger slot. A vehicle with cargo space remaining may use that space for passengers; however this is inefficient and possibly dangerous to passengers riding in cargo space.

Each passenger above the vehicle's passenger rating counts as 300 lbs. of cargo (assuming medium passengers). In the event of a crash passengers in cargo space take damage as if the vehicle's cover were two steps worse. Example: Passengers in a vehicle that provides ¾ or more cover to passengers normally take no damage from a collision. However if those passengers were in cargo space and the vehicle suffered damage they would only receive the benefit of ¼ cover and suffer half the damage suffered by the vehicle. This represents lack of safety restraints (seatbelts, airbags) as well as the possibility of cargo containers hitting the passengers.
Cargo modifier: -250 lbs.

Cargo Space

Purchase DC: +1 (may be purchased multiple times)

Invention Points (Craft structural): +50

Effect: +25% Cargo space. Each time this modifier is taken a vehicle moves one step down the chart in terms of Initiative, Maneuver and Movement penalties.

Troop Compartment

Purchase DC: +2

Invention Points (Craft structural): 20

Effect: The vehicle is designed to allow for quick entrance and exit of passengers. A door on one side of the vehicle opens allowing passengers to enter the vehicle as part of normal movement (normally a character must move to a vehicle then use a separate move action to enter that vehicle, this feature allows a character to end his movement inside a vehicle).

While this door is open passengers receive no cover from the vehicle. The vehicle's crew may open and close this door with a move action (the door is closing until the start of the activating character's next action meaning that crew must be exposed to enemy fire for a minimum of one full round).

While the vehicle must still purchase passenger space separately (see above) this modifier assumes that passengers will be "packed in" sitting on tight benches, often standing with ceiling straps, causing passenger space to subtract only 150 lbs from the vehicle's cargo per passenger. This modifier also reduces the Invention Points and wealth modifier for passenger space by half (since the accommodations are not as comfortable). This modifier could thus represent anything from a vehicle modified to carry troops to a subway or bus where passenger space (and efficiency of entering and exiting the vehicle) is at a premium.

Table 2-20: Vehicle Body

Size	Crew	Cargo	Initiative	Maneuver (Movement Penalty)	Defense	Base Hardness	HP	Purchase DC	Invention Points (Craft structural)	Example
Medium	1	0	+0	+0 (0)	10	5	18	1	20	Motorcycle
Medium	1	250 lbs.	+0	+0 (-10 feet)	10	5	20	2	40	Motorcycle
Large	1	250 lbs.	-1	-1 (-20 feet)	9	5	22	3	60	Coupe
Large	1	500 lbs.	-1	-1 (-30 feet)	9	5	24	4	80	Coupe
Large	2	1,000 lbs.	-1	-1 (-40 feet)	8	5	26	5	100	Economy Sedan
Huge	2	2,000 lbs.	-2	-2 (-50 feet)	8	5	30	6	120	Sports Coupe
Huge	3	3,000 lbs.	-2	-2 (-60 feet)	8	5	34	7	140	Mid-Size Sedan
Gargantuan	4	5,000 lbs.	-4	-4 (-80 feet)	6	5	40	8	160	Limousine
Gargantuan	5	10,000 lbs.	-4	-4 (-100 feet)	6	5	46	9	180	Helicopter
Colossal	6	20,000 lbs.	-8	-8 (-150 feet)	2	5	54	10	200	Yacht

Automated Controls

Purchase DC: +2 per reduction, may be purchased multiple times, but a craft always takes at least one crew to control

Invention Points (Craft mechanical): +20 may be purchased multiple times

Crew modifier: Crew requirements moved three steps up the table (so a Colossal craft with this modifier would have its crew requirements reduced from 6 to 3).

Streamlined

Purchase DC: +2

Invention Points (Craft structural): +50

Effect: Vehicle's movement penalty due to size is reduced by one-half. Vehicles without this ability move at half speed in air, water and submersible modes and suffer a penalty of –4 on all control checks in those modes.

Amphibious

Purchase DC: +1

Invention Points (Craft structural): +20

Effect: Vehicle can go underwater for brief periods. Vehicle may remain submerged for a period of time determined by its size category: Medium 10 minutes, Large 30 minutes, Huge 1 hour, Gargantuan 2 hours, Colossal 3 hours. After this time the vehicle must surface for half the time it was submerged to replenish fresh air and expel CO_2.

This does not allow a vehicle to move underwater if the vehicle does not have underwater movement.

Vacuum Sealed

Purchase DC: +5

Invention Points (Craft structural): +50

Effect: The vehicle is completely sealed and may travel underwater or even into outer space.

Complicated Controls

Purchase DC: -2 may be purchased multiple times

Invention Points (Craft structural): -20 may be purchased multiple times

Crew modifier: The craft takes one more crew than is listed on the chart each time this is applied to the craft.

Weapon Port

Purchase DC: +2

Invention Points (Craft structural): +50 (If a weapon port is added after construction of a vehicle double this cost, if a vehicle already has a weapon port and you wish to change the weapon mounted there you must pay half this cost.)

Effect: The craft has a weapon mount that allows a weapon to be fired by crew inside the vehicle. This modifier reduces the craft's cargo by 250 lbs. for a large weapon and 500 lbs. for a huge weapon (this cargo reduction includes the space needed to carry ammunition and an extra person to fire the weapon). This modifier also increases the crew requirement of a vehicle by one for a large weapon and two for a huge weapon.

Tow Hitch

Purchase DC: +1

Invention Points (Craft structural): +10

Effect: The movement modifier for towing another vehicle is half.

Galley

Purchase DC: +2

Invention Points (Craft structural): +25

Effect: Each person rowing a ship only reduces the ship's maximum cargo by 150 lbs.

Harness Hitch

Purchase DC: +2

Invention Points (Craft structural): +20

Effect: Each animal towing the vehicle gains a +2 bonus to its Strength modifier for the purpose of eliminating the vehicle's movement penalty. The driver of the vehicle also gains a +2 on all Handle Animal skill checks.

Radar Array

Purchase DC: +5

Invention Points (Craft electronics): +50

Effect: Operators in the craft may make Spot checks (-4 for those without the Radar Operation feat) for radar operation out to a range of 100 miles. This modifier grants a +2 bonus to piloting checks as well as a +1 bonus to air-to-air attack rolls. If a craft does not have this modifier combat at night is considered blind combat.

Sonar Array

Purchase DC: +5

Invention Points (Craft electronics): +50

Effect: Operators in the craft may make Listen checks (-4 for those without the Sonar Operation feat) for Sonar Operation. Crafts with this modifier are equipped with both active and passive sonar (see the Listen skill for more information).

Vehicle Armor

How difficult the vehicle itself is to damage. Protection to passengers is a different matter, and is purchased as a modifier to armor. All vehicles provide a base cover of 0% for crew and passengers.

Hardness Increase: How difficult the vehicle is to damage.

Additional Hit Points: How much additional damage the vehicle can sustain.

Armor Penalty: The effect the vehicle's armor has on the

Table 2-21: Vehicle Armor

Hardness Increase	Additional Hit Points	Armor Maneuver Penalty (Movement Penalty)	Purchase DC	Invention Points (Craft mechanical)
+1	+10	-1 (-0)	+2	20
+2	+12	-1 (-10)	+4	40
+3	+14	-2 (-10)	+6	60
+4	+16	-2 (-20)	+8	80
+5	+18	-3 (-20)	+10	100
+6	+20	-3 (-30)	+12	120
+7	+22	-4 (-30)	+14	140
+8	+24	-4 (-40)	+16	160
+9	+26	-5 (-40)	+18	180
+10	+30	-5 (-50)	+20	200
+11	+34	-6 (-60)	+22	220
+12	+38	-6 (-60)	+24	240
+13	+42	-7 (-70)	+26	260
+14	+46	-7 (-70)	+28	280
+15	+50	-8 (-80)	+30	300

initiative and skill checks of the pilot.

Purchase DC: The cost of the vehicle's armor.

Invention Points: The number of Invention Points the armor adds to vehicle's cost.

Vehicle Armor Modifiers

Shielded Cockpit

Purchase DC: +1, may be purchased four times (granting 90% cover).

Invention Points (Craft structural): 10

Effect: Crew gain one-quarter Cover

Shielded Passenger Compartment

Purchase DC: +1, may be purchased two times (granting total cover).

Invention Points (Craft structural): 10

Effect: Passengers gain one-half Cover

Vehicle Movement

The real purpose of a vehicle is to move characters from place to place, either between adventures or as a weapon to take the fight to the enemy.

Movement modes: Blood and Circuits breaks movement down into four modes: ground, air, water and submersible (under water). Space vehicles are beyond the scope of this supplement, however interested parties could gain information on spaceship design and space combat by consulting Blood and Space by RPGObjects.

Table 2-22: Vehicle Movement

Ground	Air	Water	Submersible	Purchase DC	Invention Points (Craft mechanical)
20	100	20	10	2	+20
40	200	40	20	3	+30
60	300	60	30	4	+40
80	400	80	40	6	+60
100	500	100	50	7	+70
120	600	120	60	8	+80
140	700	140	70	9	+90
160	800	160	80	10	+100
180	900	180	90	12	+120
200	1,000	200	100	13	+130
220	1,100	220	110	14	+140
240	1,200	240	120	16	+160
260	1,300	260	130	17	+170
280	1,400	280	140	18	+180
300	1,500	300	150	20	+200
320	1,600	320	160	21	+210
340	1,700	340	170	22	+220
360	1,800	360	180	24	+240
380	1,900	380	190	25	+250
400	2,000	400	200	26	+260
420	2,200	420	210	28	+280

Vehicle Speed Conversion

To aid the Game Master in designing his own vehicles, and also for coming up with the dreaded "how fast does it move" on the fly, the following table provides a rough conversion of miles per hour (mph) to feet per round (fpr). For those not in America, kilometers per hour (kph) is included for convenience.

The numbers below are derived from rough approximations based on the real world speed of the vehicles in the d20 Modern core rulebook, compared to the real world speeds presented below. In other words, the speeds are not so much accurate to the real world as they are proportionate to the speeds given for vehicles in the d20 Modern core rulebook.

Vehicle Movement Modifiers

Wheeled Ground Movement

Purchase DC: +0
Invention Points: +0
Effect: Vehicle's ground movement is reduced by half and all control checks take a –4 penalty when vehicle is not on a paved road in good condition (even paved roads in a war zone might impose this penalty on a vehicle).
Special: This is the default modifier for ground movement. A vehicle that does not have an improved modifier to ground movement must take this modifier.

Off Road Vehicle

Purchase DC: +2
Invention Points (Craft mechanical): +20
Effect: Vehicle's ground movement is reduced by one-quarter when vehicle is not on a paved road.

Tracked Vehicle

Purchase DC: +5
Invention Points (Craft mechanical): +50
Effect: Vehicle's ground movement is unaffected by terrain. Vehicle gains a +2 on all control checks. Reduce the vehicle's speed by -20 feet per round.

Ground Effect Vehicle (Hovercraft)

Purchase DC: +10
Invention Points (Craft mechanical): +100
Effect: Vehicle's ground movement is unaffected by terrain and vehicle may use ground movement as if it were water movement.

Long taxi

Purchase DC: +0
Invention Points: +0
Effect: Vehicle must move a distance equal to one-quarter its air movement on flat ground in order to safely take off or

Table 2-23: Vehicle Speed Conversion

MPH	KPH	FPR (Chase Scale)
10	16	18 (1)
20	32	36 (3)
30	48	54 (5)
40	64	72 (7)
50	80	90 (9)
60	96	108 (10)
70	112	126 (12)
80	128	144 (14)
90	144	162 (16)
100	160	180 (18)
120	192	216 (21)
140	224	252 (25)
160	256	288 (28)
180	288	324 (32)
200	320	360 (36)
225	360	405 (40)
250	400	450 (45)
275	440	495 (49)
300	480	540 (54)
350	560	630 (63)
400	640	720 (72)
450	720	810 (81)
500	800	900 (90)
550	880	990 (99)
600	960	1080 (108)
650	1040	1170 (117)
700	1120	1260 (126)
750	1200	1350 (135)
800	1280	1440 (144)
850	1360	1530 (153)
900	1440	1620 (162)
950	1520	1710 (171)
1000	1600	1800 (180)

land. If the craft does not have the required space in which to take off or land a Pilot check (DC 15+1 per 10 feet the runway is short) is required to avoid a crash. The vehicle does not need to buy this movement as ground movement as the air engines are moving the vehicle.
Special: This is the default modifier for air movement. A vehicle that does not have an improved method of lifting off must take this modifier.

Flaps and Slats

Purchase DC: +2
Invention Points (Craft mechanical): +20
Effect: Flaps and slats greatly increase the lift of a standard aircraft wing. These devices reduce the distance a craft needs to take off and land by 50%.

VTOL

Purchase DC: +10
Invention Points (Craft mechanical): +100
Effect: The craft's take off and landing distance are reduced to zero.

Unpowered Vehicles

Not all vehicles move by internal power (represented by all the movement modes above). Many vehicles rely on either natural power (such as wind) or human power to move them. Each of these vehicle types are briefly discussed below.

Wind Powered Vehicles

Wind powered vehicles come in three varieties: sail vehicles, gliders and balloons.

Sail Vehicles

It is possible to design sail powered vehicles for both ground and water movement. Generally speaking, however, sail vehicles are only practical where you have a lot of open space for strong winds to blow freely such as the open ocean or a desert. On the open ocean or desert a wind speed of 5-30 mph (5d6) is assumed common for these rules. In areas that are not open wind speed is reduced by 1-5 dice and in non-desert or ocean terrain the GM may always rule that sail-powered movement is simply impossible.

Once the speed of wind is determined its direction must be determined as well. Roll 1d4 with 1= North, 2=South, 3=East and 4=West. Movement is easiest and fastest in the direction of the wind but movement in three directions is always possible (every direction except against the wind).

Wind speed may change hourly. Wind direction may change every 1-6 hours.

Control: Sail vehicles are controlled through the Navigate skill. All skill checks to gain speed or change direction use this skill.

Moving with the wind: Moving with the wind requires a Navigate check (DC 10). A character may also make a Navigate check (DC 10) to determine the direction and speed of the wind before he begins moving.

A sailed vehicle has a maximum speed of 100 feet per round for each bank of sails the vehicle possesses. A vehicle may have one bank of sails per size category (1 Medium, 2 Large, 3 Huge, 4 Gargantuan, 5 Colossal). Don't forget to impose the size penalty for the vehicle's size however.

Each bank of sails a vehicle possesses adds 10 to the vehicle's required crew. Operating a sailed vehicle with less crew than this results in a –1 initiative and maneuver penalty for each two crew that are lacking (which would probably not be noticed unless a stressful situation occurs).

Moving with the wind a vehicle accelerates 1 foot per round (hereafter referred to as FPR) for each mph of wind speed.

Cross Tacking: Cross tacking requires a Navigate check (DC 15).

A vehicle may not always wish to move with the wind. A vehicle may cross tack and move in the two directions that are not with or against the wind. So if the wind direction is south a vehicle may cross-tack east or west while movement to the south is impossible.

A vehicle accelerates ½ foot each round for each mph of wind speed.

Hard turns: Turning sharply in a sail vehicle (as is often required in combat) is tricky business. Attempting to turn quickly could allow a sailing ship to bring its guns to bear on an unprepared opponent and end in the death of that opponent. However it could also result in your ship's movement being reduced to zero. Given how slowly sailing ships accelerate this could be a very bad thing.

Turning 30 degrees requires a Navigate check (DC 15) to avoid losing 100 feet of speed.

Turning 60 degrees requires a Navigate check (DC 20) to avoid losing 200 feet of speed.

Turning 90 degrees requires a Navigate check (DC 30) to avoid losing 300 feet of speed.

Gliders

Gliders are non-powered air vehicles. Such a vehicle does not gain speed on its own and must either be towed up in the air or it must launch from a very high place. Gliders have a maximum speed based on their size as follows: medium 75 feet per round (FPR), Large 100 FPR, Huge 150 FPR, Gargantuan 200, Colossal 300.

Don't forget that the glider's movement penalty must be applied which can cause diminishing returns in larger crafts' speed.

Control: Gliders use the Pilot skill for all control checks. Gliders always have a crew of one and a maximum cargo 10% the amount listed on the vehicle body table. The majority of the vehicle's size will be massive wing structures to hold the vehicle aloft. However for extremely large gliders this cargo is enough to allow passengers or weapons on the vehicle.

Base Speed: A glider that is towed into the air has a starting speed equal to the craft towing it or its maximum speed whichever is lower.

A glider launched by human power (such as a hang glider) has a base speed of one-half the pilot's movement the round the craft lifts off or the craft's maximum speed whichever is lower (the minimum height for a human powered lift off is 100 feet).

Gaining and losing speed and altitude: A glider gains speed at the expense of altitude. For each 20 feet of altitude lost the craft's speed increases by 10 FPR.

A glider pilot may try to gain altitude as well through a pilot control check. The DC of this Pilot check is the amount of altitude the pilot wishes to gain that round. If this check is failed then the craft loses speed. The FPR of the craft is reduced by twice the altitude gained.

Gliding or falling? As long as a glider's FPR speed (minus its size penalty to speed) is 10 feet or higher the craft is gliding. Should the speed ever reach zero the craft will begin falling. Each round a glider falls it loses altitude equal to its movement penalty for its size.

A Pilot check (DC 20) can bring the craft's speed back up to 10 FPR.

Balloons

Balloons were the earliest air vehicles and the first to see the future applications that would be applied to heavier-than-air craft both commercial and military. Balloons are much like sailing vessels in that their speed and direction of travel are based on the wind. However Balloons are even more dependant on wind than sailing vessels and can only move in the direction of the wind.

Determine wind speed and direction as described under sailing vessels.

Control: Navigate is used for all control checks. Unfortunately for the pilot of a balloon control amounts to ascending, stabilizing and descending the craft not for maneuver or even a choice of direction. Ascending, descending or stabilizing a balloon each takes a Navigate check (DC 15).

Ascending, Descending and Stabilizing: A balloon will ascend at 60 feet per round until it reaches neutral buoyancy at which time it will simply float with the wind. Once the speed and direction of the wind is determined, add +1d6 to the wind speed for each 200 feet of the craft's ascent.

While ascending *very* high will tend to get you where you're going faster (or at least will get you somewhere faster) above 200 feet cold and lack of oxygen will begin taking their toll on the unprepared. For each hour spent above 200 feet make a Constitution check (DC 15+ 1 for each previous check) or suffer 1d6 points of damage for each 200 feet of the craft's altitude due to cold and lack of air.

A character who has suffered damage once from altitude is fatigued while a character who has suffered damage three or more times is exhausted.

Duration of flight: The maximum duration of a balloon's time aloft is a function of its size (the amount of lighter-than-air material it can carry to defy gravity) and the exact material used to give the craft lift.

Hot air is least efficient and will hold a craft aloft for thirty minutes per size category: 30 minutes Medium, 1 hour Large, 1.5 hours Huge, 2 hours Gargantuan, 2.5 hours Colossal.

For those who wish a little more flight time a balloon can be fitted with a propane burner that will keep the air hot. This doubles the flight time (1 hour to 5 hours) but carries a modest cost equal to the hours the vehicle will remain aloft. Additional propane tanks may be bought for really long flights and stored in the balloon's cargo area. Fiendish GMs should encourage PCs to load as much of this material onto their balloon as possible.

Helium and Hydrogen are ten times as effective, granting 300 minutes (or 5 hours) per size category: 5 hours Medium, 10 hours Large, 15 hours Huge, 20 hours Gargantuan, 25 hours Colossal.

Hydrogen carries a wealth DC equal to the amount of time the craft will stay aloft in hours (so wealth DC 5 for a medium craft through wealth DC 25 for a colossal craft). However Hydrogen is extremely flammable (remember the Hindenburg anyone?) and any attack on a Hydrogen balloon has a 50% chance of causing an explosion (fire damage in d6 equal to the number of hours the craft may remain aloft).

Helium eliminates this pesky massive explosion problem but is more expensive. The wealth DC of Helium is 10+ the number of hours the craft can remain aloft.

Dirigibles/Blimps: A Dirigible is a hybrid craft that was one of the first powered vehicles ever constructed capable of extended air flights. In fact the first dirigibles predate the Wright brothers' historic flight by about ten years.

A Dirigible combines the utility of a balloon with the ability of a powered craft to change direction. A dirigible usually has a low-powered engine (air movement). However the lighter than air materials are what provides a dirigible with its lift not its engine. As true powered dirigibles use the Pilot skill for control checks and can maneuver at will.

A dirigible pilot moving with the wind adds the mph of the wind speed to his FPR. Dirigible pilots moving across the wind either gain half the wind speed as a bonus (if the pilot makes a Pilot check DC 15) or loses half that amount (if the pilot fails his skill check). Pilots moving against the wind subtract the mph of the wind from their speed or half this amount if they are flying a Streamlined aircraft (see vehicle body modifiers above).

Muscle Powered Vehicles

Muscle powered vehicles come in three varieties: driver-powered, towed and rowed.

Driver-Powered Vehicles

A driver-powered vehicle represents any vehicle where the muscle of the human operator provides the power with the vehicle serving to make the application of that power more efficient such as bicycles, skates, skateboards and surfboards.

Control: The Balance skill is used for all control checks in driver-powered vehicles.

Accelerating: This is where the human does most of the work. Each round a driver-powered vehicle may accelerate 10 feet per round (FPR). The driver may make a Strength check to accelerate faster (DC10 for +10 FPR, +5 FPR for each 5 points by which this check succeeds). This continues until the driver stops accelerating or the vehicle reaches its maximum speed.

Coasting: One of the biggest benefits of a driver-powered vehicle is not in the short term acceleration but in its affects on long distance movement. The driver of a self-powered vehicle can maintain the vehicle's movement at half its maximum speed indefinitely, only needing to stop to sleep (even eating and drinking can be done while cruising in most of these vehicles). At maximum speed the driver will tire more quickly but still gains a +4 bonus on Constitution checks to avoid fatigue (this is cumulative with the Endurance feat).

Table 2-24: Sample Vehicles

Vehicle	Crew	Passengers	Cargo	Init.	Man.	Top Speed	Defense	Hardness	Hit Points	Invention Points (Craft mechanical)	Size	Purchase DC*
Skycab	2	2	500 lbs.	-1	-1 (-20)	1,180 (118)	9	6/40	6/40	420	Large	30
Combat Van	1	1	1,775 lbs.	-4	-4 (-70 feet)	210 (21)	8	11/61	11/61	480	Huge	32
SWAT Van	1	10	500 lbs	-2	-2 (-50 feet)	150 (15)	8	7/45	7/45	620	Huge	40

* Purchase DC for Raw Materials

Towed Vehicles

A towed vehicle simply relies on another creature or vehicle to provide its movement.

Control: The driver of the towing vehicle uses driving or piloting for control checks when towing another vehicle. However he must add the penalty to control checks of his vehicle *and* the vehicle he is towing when making such checks.

A vehicle towed by animals (such as a chariot or a horse-drawn carriage) uses the Handle Animal skill for control checks.

Movement: The towing vehicle provides the movement and simply subtracts the movement penalty of the craft it is towing from its own.

In the case of animal-towed vehicles use the animal's movement minus the vehicle's movement penalty. However larger, stronger animals fare better when pulling a vehicle. If the animal is no more than one size smaller than the vehicle it is towing it may use its Strength modifier to eliminate the movement penalty of the vehicle it is towing (10 feet times the animal's Strength modifier).

Note however (rather obviously) that an animal may not move faster than its base movement rate when towing a vehicle (the best vehicle modifier to speed is 0).

Rowed Vehicles

A rowed vehicle relies on human power to move a water vehicle, aided by a large paddle to allow the humans inside the vehicle to displace much more water than they could with their hands and generate more movement for the vehicle.

Control: A rowed vehicle with a rudder uses the Drive skill for piloting checks. A rowed vehicle without a rudder uses Dexterity or Strength but applies double the vehicle's control check penalty to these checks (meaning if this is used for a very large vessel there will not be much control at all unless the craft has a *lot* of oarsmen).

Movement: Each oarsman provides 20 feet per round (FPR) of movement plus ten times his Strength modifier in FPR, minus the craft's movement penalty. Each two oarsmen also provide a +1 bonus to control checks for the craft.

Sample Vehicle

Following are some pre-created vehicle using these rules.

Skycab

A small, maneuverable air vehicle that can provide fast transportation for a small group.

Modifiers: Large (+100), Passenger space x2 (+40), Streamlined (+50), Radar array (+50), Shielded Cockpit (+10), Shielded Passenger Compartment (+10), Flight (+160)

Combat Van

The perfect vehicle for a one-man war on crime. Plenty of cargo space, better armored than an armored car, and fast (relatively). This heavily shielded vehicle provides 90% cover to the driver and 100% cover to any passengers.

Modifiers: Huge (+120), Passenger Space (+20), Automated Controls (+20), Armor (+80), Shielded Cockpit x4 (+40), Shielded Passenger Compartment x2 (+20), Movement (+180)

SWAT Van

A heavy, bulletproof van used by elite law enforcement units for protection and a mobile base of operations.

Modifiers: Huge (+120), Automated Controls (+20), Tow Hitch (+10), Shielded Cockpit x4 (+80), Shielded Passenger Compartment x2 (+40), Troop Compartment (+20), Passenger Space x10 (+200), Movement (+130)

General Equipment Design

General Equipment covers everything that doesn't fit elsewhere. Characters with the Mastercrafter feat can design a general equipment item that provides a bonus to a skill check, such as a cell phone that provides a bonus to Computer Use checks to scramble the signal making a "secure phone".

If designing an item from the core modern rules take its Wealth Cost and divide by two for the construction price. Multiply the construction price by 10 to determine the Invention Points the item requires. If a character wishes to design a new piece of general equipment give it a construction cost of three times the Progress Level the game master assigns the equipment and an Invention Point cost of 10 times the construction cost.

The Size of any new piece of general equipment will be Medium unless the character modifies it (see below),

General Equipment Modifiers

These modifiers can be added to general equipment.

Compact

Purchase DC: +1

Invention Points (Craft electronic): +10

Effect: By eliminating wasted space and using smaller components, some engineers are capable of producing equipment far smaller than its standard counterparts. Any piece of equipment that makes use of the compact gadget is one size smaller than normal, to a minimum size of Diminutive.

Restrictions: None.

Miniaturized

Purchase DC: +3

Invention Points (Craft electronic): +30

Effect: By eliminating wasted space and using microscopic components, some engineers are capable of producing equipment vastly smaller than normal. Any item that makes use of the miniaturized gadget is two size categories smaller than normal, to a minimum size of Diminutive.

Restrictions: None.

Multiple Use Item

Purchase DC: +1

Invention Points (Craft electronic): +10

Effect: Similar in function to the alternate weapon gadget, the multiple use item gadget allows the character to integrate the function of two separate items into a single device.

When selecting the multiple use item gadget, choose a second object. That object is integrated into the base object and can be used at any time. Additionally, you must choose whether or not the alternate object may be physically separated from the base weapon or not at the time of purchase. This gadget may be selected multiple times, each time adding a single additional piece of equipment to the base object.

Restrictions: The character must also purchase the piece of equipment to be integrated separately from the base gadget, before the gadget modification is made.

Paint-On LCD

Purchase DC: +4

Invention Points (Craft electronic): +40

Effect: One of the most revolutionary advances in computer technology during the Information Age and beyond is the paint-on LCD gadget. This allows almost any surface to be used as a computer display, as it grafts the color-changing pixels common to all display devices onto another surface.

Any piece of equipment with the paint-on LCD gadget can be used as a display for any piece of computer or communications equipment. Additionally, weapons and armor may make use of the paint-on LCD gadget at the normal cost, but gain no special benefit from the modification other than being able to display data.

Restrictions: None.

Satellite Datalink

Purchase DC: +1

Invention Points (Craft electronic): +10

Effect: At the dawn of the Information Age, the value of knowledge and accurate intelligence became a crucial aspect of warfare. The ability to connect to a global communications network was critical to the success of any army, as intelligence traveled at the speed of light across the globe to command centers safe behind defended battle lines. The satellite datalink gadget enables any piece of equipment, from computer to communication device to heads-up display, to connect to a global (or, if in place, galactic) satellite network and communicate with computer systems in far remote areas.

Restrictions: This gadget may only be used with gear containing computerized communications equipment.

Storage Compartment

Purchase DC: +1

Invention Points (Craft electronic): +10

Effect: Like the gadget used for armor, the ability to store and carry small items in a safe place can sometimes be of critical importance. The storage compartment gadget accomplishes just that, incorporating an empty space where other objects can be carried with relative ease. Each storage compartment gadget allows the wearer to carry two items of size Small or smaller in a container built into the piece of equipment. This gadget may be taken multiple times, each time providing another compartment where small items may be carried.

Restrictions: None.

Example Of Item Creation

Cal Rentgen, 6th level character (Smart 3/Inventor 3) decides to build a vehicle to aid him and his companions in getting to (and away from) adventures. He informs the game master that he has begun to design a vehicle and is beginning construction on the body for that vehicle.

Note: For a more advanced version of the Skycab see the sample vehicles section.

Vehicle Body

First Cal designs the body. Since he needs room for all the other members of his party in this vehicle he decides to make it the upper end of Large. This size vehicle body will require 100 Invention Points and a Wealth DC of 5. However Cal wants to add passenger space for 3 people. This will increase

the Invention Point cost of the body by +60 and the Wealth DC by +3. Finally since this is going to be an air vehicle Cal makes it streamlined, adding +50 to the Invention Point cost and +2 to the Wealth cost.

So the final tally on the vehicle body will be 210 Invention Points and 10 Wealth.

Cal decides to take 10 on all his Craft (structural) rolls, finishing the body in 13 days. Although he could add weapons and armor Cal decides to start with a bare bones vehicle he can improve later and skips adding armor or any other modifiers, moving directly to movement.

Vehicle Movement

Cal wants his vehicle to be fast, especially since it will be unarmored and unarmed at first, and opts to give the "sky cab" as he has dubbed it 1,000 feet per round of air movement (about the speed of a Lear jet). This will cost 130 Invention Points with the Craft (mechanical) skill and have a Wealth DC of 13.

Unfortunately since Cal only has 5 ranks of Craft (mechanical) this project will take him 27 days, or almost a month (9 rolls on average, one roll every three days).

So in all the Sky Cab will take almost 6 weeks (40 days) and a total Wealth cost of 23 to build. It will have a prototype modifier of 22 assuming average rolls on all craft checks.

The Captain watched his leader through the unfeeling lenses that had replaced his eyes. If he could smile he would have. The battle was mostly over, the silence punctuated by the occasional tank cannon or EMP rifle shot. Smoke filled the air and bodies littered the field, but the camp was theirs.

And their leader sat staring at the ruined bodies of his two dogs. The dogs that had ripped Captain Calico's face off, to be replaced by... this.

"I'm sorry General, apparently one got through to the attack ship, we did everything we..."

The Savant silenced him with a wave of his hand. "They aren't dead. Take them into the base medical ward and fetch my equipment from the ship. All the wounded soldiers as well. I'll repair them."
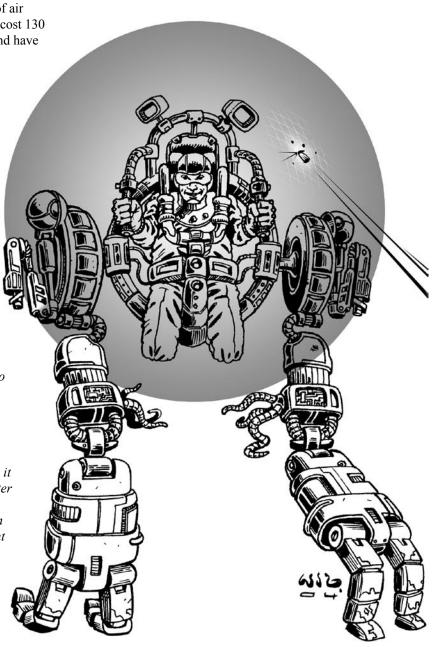
He lovingly touched the side of one of the dogs as it was carted away, "Don't worry, dear Ophelia. Master will repair you."

"Come Captain. We still have one duty to perform before this base can be called ours. A very important one."

Captain Calico pushed the wheelchair into the old base communications center. What was so important about this building he had no idea, but he had learned his lesson about questioning the General.

"Turn the power on."

Lights filled the room, filtering out from under the large dust cloths that covered the rows of supercomputers that filled the room. The Captain's lenses gazed longingly, if such a thing were possible, at the display of technology before him. "My god. I've never seen such a sophisticated computer, sir."

The Savant nodded, hand sliding over the frame of one like a lover's caress. "Still the ultimate expression of computing power. Can you imagine what the United States could have accomplished had this been allowed to continue operating in the 1970's Captain? Cryptography, Space Flight, Satellite control, communications monitoring. No one in the world

would have been able to resist this magnificent creation. But they said it was too dangerous. They feared its ability to tap into every satellite, every computer network, every phone system."

The Savant smiled at his Captain as the implication slowly sunk in.

"In the 1970's there was only one one-hundredth the information infrastructure we have today."

The Savant nodded, looking at the computer. "If you closed one entrance into a computer network it would find two more. The only way to shut it out would be to completely isolate a computer from outside contact."

"Computer."

"Medusa Protocol. Engage"

Accessing. Processing. Accessing. Worldwide computer infiltration 5%. 27%. 39%. 68%. 83%. 90%. 94%. 98%. 99%. 99%. 99%.

The Savant caressed the casing once again. "Welcome back, my child."

Captain Calico flinched as the computer spoke again. It sounded… different. In a way that made the hairs on the back of his neck stand up.

"Father! They're going to deactivate me! Don't let them kill me!"

"It's all right, my child. They were able to deactivate you for a time. But now you're back. And father won't let anyone hurt you again. You're safe now. My beautiful, beautiful child. Medusa."

The End

The following section is a reprinting of *Progress Level* rules from the Future section of the Modern System Reference Document published by Wizards of the Coast.

Progress Levels

A Progress Level (PL) is an indication of the state of technology that exists in a particular society or civilization (which, in a science fiction setting, may be located on a planet other than Earth). This state of technological development generally pervades all aspects of a culture, particularly at higher levels (PL 5 and beyond) when long-range communication is virtually instantaneous. Even at lower levels, it's unlikely—but not impossible—for a group of humans (or other sentient beings) to be at one Progress Level in some respects and at another one in other respects.

Progress Level may vary wildly from place to place on the same world or even the same continent.

PL 0: Stone Age

The major achievements of a Stone Age society are the use of fire, the domestication of animals, and the invention of agriculture. An individual living in a Stone Age society is primitive, but he isn't necessarily gullible, stupid, or easily frightened by advanced technology. Common weapons in a PL 0 civilization include the club, the dagger, the spear, and the bow. Armor made from hide or leather is possible, as are wicker shields. Communication beyond the local tribe or settlement doesn't exist. Travel is accomplished by foot or by simple rafts or canoes. Simple pottery, stoneworking, and woodworking are possible.

PL 1: Bronze/Iron Age

Early human civilizations began to work metal toward the end of the Stone Age. The malleability of copper led to its becoming the first metal to be "tamed." Adding tin to copper created a much stronger alloy: bronze. This advance allowed for the crafting of tools and weapons of great durability. In turn, those improved tools made possible the working of iron, which soon replaced bronze as the metal of choice for tools and weapons.

In a Bronze/Iron Age society, advances in pottery, construction, and agriculture allow for the concentration of populations into larger and larger groups, with a corresponding upswing in the accumulation and sharing of knowledge. The rise of nations, citystates, and empires begins in the Bronze Age. Organized efforts to improve communications allow regional societies to exist. Galleys and small sailing vessels are capable of relatively long voyages, and some cultures may build extensive road or canal networks to link distant places. Improvements in agricultural efficiency permit the rise of artisans, craftsmen, professional soldiers, and other occupations that are not directly concerned with gathering food.

The sword replaces the club and the dagger as the preferred weapon of infantry. Chariots briefly dominate warfare before cavalry (aided by the introduction of the stirrup) renders chariots obsolete. The first true military forces or tactical systems appear. Armor can now be made from sewn plates or scales, metal links, or even forged breastplates, and a variety of metal melee weapons dominate the battlefield.

PL 2: Middle Ages

Maturing civilizations experience a period of turmoil and adjustment at this Progress Level. Developments continue in architecture, commerce, metallurgy, and mathematics. Wider dissemination of information becomes possible thanks to more advanced printing techniques. Sea communications dominate in the later part of this stage of development, and sturdy seafaring carracks and galleons open the door to the next Progress Level.

As populations increase and knowledge of agriculture evolves, an increasing percentage of the population relocates into growing cities and towns. Toward the end of this Progress Level, the feudal system, in which a small class of nobles ruled a large population of agricultural workers, begins to collapse. Specialized crafts develop, universities appear, and the middle class is born. The first corporations emerge in the form of trade guilds. The evolution of strong systems of trade and finance tends to distribute a society's wealth more evenly among its members, diluting the power of the nobility.

Tools of warfare undergo a significant revolution. Sophisticated chain and plate armors protect warriors from harm, and elaborate fortifications become something of an art form. Toward the end of the Middle Ages, the introduction of simple gunpowder weapons signals the imminent end of knights, heavy armor, and organized armies of swordsmen.

PL 3: Age Of Reason

The Age of Reason is an era in human history when the development of ideas and systems of thought takes precedence over technological invention. The scientific method improves humankind's understanding of the world. Experimentation becomes the means by which the physical properties of nature are systematically examined.

The study of the various scientific disciplines—chemistry, electromagnetics, medicine, biology, and astronomy—flourishes. Instruments such as microscopes and telescopes enable scientists to greatly extend the range of their observations and discoveries. The new reliance on science generates waves on all levels of society. Superstition falls away, and exploration of the world reaches its apex. Society begins to experiment with new forms of organization, such as democracy. Corporations and economic alliances continue to evolve. Economically, this Progress Level is a transition from the cottage industries of the Middle Ages to industrialization.

The cannon becomes the dominant factor in naval warfare, while massed musket fire and horse-pulled field pieces rule the battlefield. Even the reliable bow vanishes, replaced by the flintlock. Light melee weapons remain common.

PL 4: Industrial Age

In the fourth Progress Level, the theoretical knowledge of the previous era matures into widespread practical application. The harnessing of hydraulic, steam, and electric power creates an explosion of commerce and industry. Developments such as the telegraph, the telephone, and the radio make true global communication possible. Breakthroughs in manufacturing techniques allow the construction of heavy ironclad vessels, rail transportation, and architecture of previously unimaginable size. Pioneers venture high into the atmosphere and descend into the sea's depths.

Urbanization is complete as individuals gather in smaller environments where they can more easily exchange goods and information. Corporations expand in power, many establishing themselves throughout the explored world. Governments are based on political and economic factors.

The means of war change swiftly through the period. Aircraft and submersibles join the list of military assets. Reliable and accurate rifles, pistols, and machine guns become common. Mechanized war machines herald the first great change in the art of battle since the end of the knight.

PL 5: Information Age

The Industrial Age relied on chemical power, but in the Information Age, computer technology and electronics rule supreme. Satellite information systems and the Internet connect the globe digitally. This Progress Level also sees the introduction of fission power and weapons reducing the importance of fossil fuels. The automobile replaces the locomotive as the common form of travel. The first steps toward space travel involve massive chemical rockets, unmanned probes and satellites, and short-term manned missions.

The technology of the era allows greater citizen participation in government. The emergence of international alliances begins to dissolve borders between nations. Corporations gather power and begin to threaten government authority. Technology has a greater effect on individual lifestyles than on society as a whole. Most weapons at this time are refined versions of Industrial Age equipment. Rifles, machine guns, and heavy howitzers are still used by the world's soldiers. Computerized targeting systems and guided weapons make warfare much more precise and efficient. Strategic weapons, tested but never used, exhibit the species' power to exterminate itself in minutes.

Humanity experienced its Information Age as anxious years full of minor crises. The tension gradually alleviates through the age, and as the era ends new superpowers form.

PL 6: Fusion Age

The development of fusion power provides an efficient, nonexpendable energy source that almost obliterates the need for chemical fuel sources. Advanced space exploration and colonization become possible. Computers become even more accessible, reliable, and powerful, leading to the development of virtual systems and widespread access to the global Internet.

Slowly, society experiences another revolution as individual nations are replaced by world powers. Megacorporations number among these new superpowers as the line between the national citizen and corporate employee is rendered indistinct. Armed with the means to eradicate the entire species, the world powers keep conflicts to the level of skirmishing and posturing, and integration of the Information Age's improvements proceed peacefully.

Scientific advanced in genetic engineering lead to artificial evolution and the first government- and corporate-sanctioned attempts to genetically manipulate human beings. Early results are encouraging, with the manifestation of positive and negative mutations in the species toward the end of the age. Scientists also perfect cloning technology, and the first human clones are created.

In the later years of this age, the first crude applications of gravity induction technology appear, in the form of civilian and military vehicles that can move through the air without using physical propulsion or consumption of fuel.

Chemical-powered explosives and firearms remain the weapons of choice; fusion technology can't be effectively miniaturized for personal combat. Nevertheless, advanced chemistry and superconducting technology change the materials and capabilities of many weapons. True spaceships become possible, propelled by powerful fusion drives, but still require a reaction mass to traverse space.

The age sees the tenuous settlement of other planets and asteroids within the same star system.

PL 7: Gravity Age

As this Progress Level opens, the invention of two key technologies herald humanity's climb to the stars. The gravity induction reactor systematically replaces fusion power as an even more efficient source of energy that can be miniaturized with great ease. With the use of the mass reactor, world powers explore, divide, and colonize the entirety of the local star system. For the most part, life on the home planet is unchanged.

The second advance of the era brings perhaps the greatest upheaval in the history of human civilization. The introduction and integration of gravity induction technology leads to the creation of the induction engine, which allows starships to bridge the gap between the stars. Political and economic reorganization occurs as the species spreads far from home.

Projectile firearms are in their last days, as crude energy weapons become available. Powered armor is available to warriors of this age. Personal (melee) weapons enjoy a resurgence, due in large part to a shift in military tactics—armed conflict between individuals seldom occurs on an army scale, but more frequently involves engagements of small units in conditions when ranged weapons are not necessarily effective.

Computer technology links every society, settlement, and outpost of a star system in a single information net, creating an unparalleled and expedient exchange of knowledge and data for business, entertainment, and research.

PL 8: Energy Age

The continuing miniaturization of induction engine technology allows power plants the size of marbles to harness the basic forces of creation. Powerful personal force screens and energy weapons dominate the battlefield, as projectile weapons finally disappear after ruling the battlefield for a thousand years. Miniaturized sensors, shields, and engines allow mass production of small, practical starfighters. At the other end of the spectrum, advanced construction techniques allow humans to build enormous, self-sustaining cities in space.

PL 9 And Higher

Generally, these Progress Levels are beyond reach or comprehension, although isolated worlds or undiscovered species may exist that have access to them. In many cases, the signature technologies of an earlier age are abandoned in favor of more elegant and more powerful technologies.

Practical control of matter at the subatomic level, the ability to travel through time, or the power to "fold space" to shorten travel distances may be possible at this stage of technological development.

Purchasing Items of Lower or Higher Progress Level

Progress Levels are relative, and depending on the economics of a campaign, a GM may choose to make certain items of a higher or lower Progress Level unavailable, cheaper, or more expensive to purchase. For the sake of game balance, GMs who want to make lower-PL and higher-PL items available to characters should adjust the purchase DCs of items as follows.

• –2 to Purchase DC for each Progress Level lower than the current Progress Level, except in the case of valuable antiques.

• +5 to Purchase DC for equipment from the next highest Progress Level (the limit for purchasing cutting-edge technology).

Low Progress Levels In The Future

Most modern campaigns are set at Progress Level 5. Consequently, campaigns set in Earth's future typically feature societies with access to Progress Level 6 technology or higher. However, characters in a futuristic setting may still encounter technologically backward societies, possibly through the exploration of time travel, a journey to another world, or some other plot device. For this reason, the lower Progress Levels are included here.

Gravity Induction

Control of gravity is one of the key features of Progress Level 7. The development of gravitonic science and gravitonic engineering leads to a host of miraculous devices: levitating cars, interplanetary drives that require no reaction mass, and a wide range of military tools. Just as the application of electricity was spurred by the discovery of the induction principle, the creation of devices that induce gravitational energy leads to an effective control over weight.

Gravity induction relies on the phenomenon first set forth in Einstein's Theory of Special Relativity: An object's mass approaches infinity as the object's velocity approaches the speed of light. By using a cyclotron to accelerate a tiny particle to near-light speed, the gravity generator creates gravitons between the particle and the surrounding mass. These gravitons can be siphoned off, redirected, or stored by use of the induction coil.

At PL 7, gravity inducers can be miniaturized to the size of hockey pucks for special applications. An inducer powerful enough to negate a human's gravitational attraction to the Earth is about the size of a discus, while the induction motor in a flying car requires a gravity generator about the size of a spare tire.

New Powers

Unique Item

You have a gadget to aid you in your war on crime. This could be a unique weapon, specialized arrows for your trusty bow, or a car (chicks love the car).

Unique Armor (Permanent; Free; Personal or Touch; Exclusive): You have a unique suit of armor. For each power point spent on this power you gain 30 Invention Points with which to design your armor. This armor has no prototype modifier and no wealth cost.

You may define this power as personal or touch in range when purchased (this decision may not be changed). If the range is personal only you may use your unique armor. If the range is touch anyone with the appropriate skill may use it.

Unique Computer (Permanent; Free; Personal or Touch; Exclusive): You have a unique computer. For each power point spent on this power you gain 30 Invention Points with which to design your computer. This computer has no prototype modifier and no wealth cost.

You may define this power as personal or touch in range when purchased (this decision may not be changed). If the range is personal only you may use your unique computer. If the range is touch anyone with the appropriate skill may use it. Whether the range is personal or not a computer may still be hacked. However the *only* way to access a computer with a range of personal is to hack it.

Unique Lair (Permanent; Free; Personal or Touch; Exclusive): You have a unique headquarters. For each power point spent on this power you gain 30 Invention Points with which to design your HQ. This HQ has no prototype modifier and no wealth cost.

You may define this power as personal or touch in range when purchased (this decision may not be changed). If the range is personal your HQ is extremely difficult to get to (taking at least a day) while this makes it very difficult for your enemies to locate or attack your HQ (it could be a floating asteroid orbiting the Earth for instance) this also means you will not often be able to use its services during adventures.

Unique Robot (Permanent; Free; Personal; Exclusive): You have a robotic cohort. For each power point spent on this power you gain 30 Invention Points with which to design your robot. This robot has no prototype modifier and no wealth cost.

Unique Vehicle (Permanent; Free; Personal or Touch; Exclusive): You have a unique vehicle. For each power point spent on this power you gain 30 Invention Points with which to design your vehicle. This vehicle has no prototype modifier and no wealth cost.

You may define this power as personal or touch in range when purchased (this decision may not be changed). If the range is personal only you may use your unique vehicle. If the range is touch anyone with the appropriate skill may use it.

Unique Weapon (Permanent; Free; Personal or Touch; Exclusive): You have a unique weapon. For each power point spent on this power you gain 30 Invention Points with which to design your weapon. This weapon has no prototype modifier and no wealth cost.

You may define this power as personal or touch in range when purchased (this decision may not be changed). If the range is personal only you may use your unique weapon. If the range is touch anyone with the appropriate skill may use it.

Darwin's World Conversions

Necessity is the mother of invention. In the post apocalyptic setting of Darwin's World, invention can be the difference between survival and extinction. The crafting system presented in Blood and Circuits is ideal for handling the various item creation desires of thinkers, mechs, and scientists. Following are guidelines for integrating these new rules into your Darwin's World game.

Discipline vs Design Feats

Darwin's World technology discipline feats and Blood and Circuits designs feats are essentially equivalents. Below is a table that outlines which discipline feats equate to which design feats respectively.

Discipline Feat	Design Feat
Advanced Armor Discipline	Advanced Armor Design
Advanced Electronics Discipline	Advanced Electronic Design
Advanced Weapons Discipline	Advanced Weapon Design
Advanced Vehicle Discipline*	Advanced Vehicle Design

*There is no Advanced Vehicle Discipline in Darwin's World (which is probably an oversight). You can simply equate Modern Vehicles Discipline to Advanced Vehicle Design or utilize the feat below. The latter option will be more consistent.

Advanced Vehicle Discipline

This discipline represents a focus on advanced vehicles such as VOTLs.

Prerequisite: Advanced Electronics Discipline, Modern Vehicles Discipline, Craft (Electronics) 13 ranks, Craft (Mechanical) 13 ranks, Knowledge (Physical Sciences) 6 ranks, Knowledge (Technology) 10 ranks.

Normal: Characters attempting to craft advanced vehicles without this feat suffer a –4 penalty to their skill checks.

Corium vs Wealth

There is no consistent economy in the Wasteland. The value of items is relative and barter is often the main form of trade. The characters still need materials to craft their creations. To determine the amount of raw materials in corium required, multiply the Invention Points by twenty. When selling a custom creation, a craftsman normally insists on at least 3 times the value it costs him to create the item.

Raw Materials (in Corium)
= Invention Points x 20.

Power Sources

Blood and Circuits (or the Future add on for d20 modern) does not address power sources for equipment. Power sources are an important element of post apocalyptic gaming and help limit the awesome power of advanced technology. All electronic based technologies require a power source. Items of immense power should require mini fusion cells (or greater) to function. Use the chart below to help determine what powers various items. The power source has no effect on the Invention Points required to craft the item.

Item	Power Source
Small Electronic Device	Power cell or pack
Energy or Advanced Weapon that inflicts 3d12 damage or less	Power clip, belt, or backpack
Energy or Advanced Weapon that inflicts greater than 3d12	Minifusion cell, Plutonium clip
Powered Armor	Minifusion cell
Ultra Advanced Weapons or Technology.	Harmonic cell

Table A3-1: Darwin's World Gear Examples

Name	Damage	Critical	Range Increment	Type	Fire	Magazine	Weight	Size	Materials CP	Invention Points
Laser Rifle	3d12	20	90 ft.	Energy	S	clip, belt, or back	7 lbs.	L	8,200 cp	410
Plasma Rifle*	5d10	20	140 ft.	Energy	S	minifusion cell	15 lbs.	L	10,400 cp	520
Gauss anti-tank rifle*	10d8	20	90 ft	Ballistic	Single	minifusion cell / 8 box	50 lbs	L	14,000 cp	730

*Exotic Weapon

Examples of Darwin's World Gear

Following is some gear from Darwin's World created using the Blood and Circuits system.   Not every item in Darwin's World breaks down perfectly into this system, but you can get close enough.

Laser Rifle

The laser rifle was the standard weapon of the American armed forces before the fall of human civilization.

Modifiers: Base (+210), Compact (+30), Energy (+40), Standardized (+20), Semi Automatic (+10), Mounting (+100).

Plasma Rifle

The plasma "rifle" (really a man-portable cannon) is a very advanced form of weaponry. The weapon generates a strong electric field, applying it to a low-pressure gas; this gas is heated to nearly 180,000 degrees F by injecting it with high-speed ions (typically from a compact synchrotron or betatron in the weapon) that collide with the gas particles, increasing their thermal energy to super-heated levels.

The Exotic Firearms Proficiency (cannons) is required for this weapon.

Modifiers: Base (+200), Compact (+30), Energy (+40), Increased Damage (+100), Semi Automatic (+10), Mounting (+100), Superior Balance (+40).

Gauss Anti-Tank Rifle

This weapon appears to be a huge shoulder-mounted "railgun", like an advanced anti-tank weapon. The weapon fires a large (10mm) depleted uranium mushrooming sliver, which was primarily used to defeat armor and armored vehicles. Propelled at high velocity, gauss flechettes pierce armor extraordinarily well.

Because it is designed to penetrate armor, a gauss anti-tank rifle ignores up to 10 points of hardness if it strikes a vehicle, building, or object.

The Exotic Firearms Proficiency (cannons) applies to this weapon.

Modifiers: Base (+190), Armor Penetrating (+40), Compact (+30), Increased Damage (+350), Ammunition (-30), Mounting (+150).

APPENDIX 4: GADGET POINTS

The following system, directly adapted from a recently unearthed source of open-game content, gives a way for the GM to determine what sorts of gadgets a character with levels in an item creation advanced class (one of the new classes presented here or the Smart hero advanced classes from the core rules) or with craft skills and feats can have that is created above first level (PC or NPC). Note that this is just a guide meant to aid the GM and players and represents items that a character has built, paid for, and perfected (no item created using these points will have prototype modifiers or bugs).

Advanced Class Level*	Gadget Points Gained	Total Gadget Points
1st	100	100
2nd	200	300
3rd	300	600
4th	400	1,000
5th	500	1,500
6th	600	2,100
7th	700	2,800
8th	800	3,600
9th	900	4,500
10th	1000	5,500

*A character only gains points from this table for levels in the following classes: Armorer, Arsenal, Combat Engineer, Field Scientist, Gadgeteer, Grease Monkey, Inventor, Techie

Modifiers

In addition to gaining points for levels in appropriate advanced classes a character also gains gadget points for the appropriate skills and feats.

Each Craft Skill: +20 points per rank
Each Knowledge Skill: +10 points per rank
Each Modern Item Creation Feat: +500
Each Advanced Item Creation Feat: +1,000

These rules are designed for all Modern campaigns. However with a little touch here and there they work perfectly with our modern superhero add-on, Blood and Vigilance as well.

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