Rifts Weapons & Equipment

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Rifts Earth

Battlefield Artillery for Rifts Earth by Kitsune & Chris Curtis. (12/18/98)
Free Quebec SAMAS augmentation by Kitsune. (11/12/1998)
REEF Equipment by Kitsune. (11/15/1998)
REEF Missile Pods by Kitsune. (04/01/1998)
Revised bomb and missile table (Hosted at Section 7) By Chris Curtis, Mad Dog, & Kitsune .
New Rifts Weapons & Armor by Kitsune . (01/24/2000)

Mutants in Orbit

CSDF Weapons & Armor by Mischa (12/11/1998)
Heckler & Koch Meteor Railgun by Mischa (09/03/1998)

Phase World

Battle Link by Mischa & Kitsune. (12/17/1998)
Star Hammer Weapon System by Mischa (12/18/1998)
Graviton Bomb Missile by Mischa (11/26/1998)
New Coventry Pepper Box unmanned cruise missile launcher by Kitsune. (07/11/1998)
Phase World Armor, Weapons & Special Ammo by Kitsune. & Ki-Tarn Zilkia. (01/24/2000)
Phase World Medical Treatments by Kitsune . (09/03/1998)
Phase World Missile Warheads & Guidance by Kitsune . (01/19/2000)
Phase World Space Mines by Kitsune. (12/23/1997)
Phase World Special Equipment by Kitsune. (06/03/1999)
Phase World Starship Equipment by Mischa & Kitsune. (01/19/2000)

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Battlefield Artillery for Rifts (Version 1.1):

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Introduction:

In modern battle, artillery is an important component of the battlefield. Likewise it still is very important in the war torn world of the Rifts. To a certain extent, vehicle missile launchers have replaced cannon artillery but cannon style artillery is still far less expensive both to purchase and use. Artillery fits into two general categories: towed and self-propelled. Since self-propelled artillery varies greatly, it will be covered separately and written up as vehicles based off of modern equivalents where possible.

Listed are the most common types of artillery and rounds for the Pre-Rifts United States, there have been nuclear artillery shells but I have not listed their damages and effects. Nuclear artillery shells are also extremely rare, even more than nuclear missiles and bombs are. This is because nuclear weapons are normally considered strategic weapons and in the hand of the Government not the military.

Towed artillery is designed for ease of carrying but towed artillery has a much lower rate of fire then automatic loading systems which would be used in some self propelled artillery and most naval vessels. As a hand loaded artillery continues fire, it cannot sustain a full rate of fire. This is because of loader fatigue, robots used as loaders allow the cannon to fire at full rate of fire continuously.

These rules may also be used for many naval ships weaponry as well as for other modern Palladium games games in addition to Rifts.

Towed Artillery rates of fire:

For Rate of fire of the 105 mm Howitzer: For the first minute (four melees), the gunners and loaders can fire 2 shots per melee. For the next three minutes, the gunners and loaders can fire at a rate of 3 shots every two melees. The gunners and loaders can sustain a rate of 3 shots every four melees. A 105 mm towed artillery also usually requires a crew of 5 people to operate at this rate of fire.

For Rate of fire of the 155 mm Howitzer: For the first minute (four melees), the gunners and loaders can fire 1 shot per melee. For the next three minutes, the gunners and loaders can fire at a rate of 3 shots every four melees. The gunners and loaders can sustain a rate of 1 shots every two melees. A 155 mm towed artillery also usually requires a crew of 10 people to operate at this rate of fire.

For Rate of fire of the 203 mm Howitzer: for the first minute (four melees), the gunners and loaders can fire 1 shot per melee. For the next three minutes, the gunners and loaders can fire at a rate of 3 shots every four melees. The gunners and loaders can sustain a rate of 1 shots every two melees. A 203 mm towed artillery also usually requires a crew of 15 people to operate at this rate of fire.

Guns:

Artillery Size:	Weight: Towed	Range: Non-Rocket Assisted	Range: Rocket Assisted:	Cost: Towed
105 mm Howitzer	4100 lb (1859 kg)	8.7 miles (14 km)	12.1 miles (19.5 km)	100,000 Credits
155 mm Howitzer	15800 lb (7170 kg)	13.7 miles (22 km)	23.5 miles (36.4 km)	250,000 Credits
203 mm Howitzer	16800 lb (7600 kg)	16.1 miles (25.9 km)	22.7 miles (36.4 km)	450,000 Credits

Warheads:

Fragmentation:

Fragmentation: Artillery Size:	Standard: Mega Damage:	Standard: Blast Radius:	Standard: Cost:	Rocket: Mega Damage:	Rocket: Blast Radius:	Rocket: Cost:
105 mm Howitzer	1D6x10	25 feet	550 Cr	1D4x10	20 feet	750 Cr
155 mm Howitzer	2D4x10	40 feet	1800 Cr	1D6x10	30 feet	2000 Cr
203 mm Howitzer	3D4x10	50 feet	4000 Cr	2D4x10	40 feet	5000 Cr

High Explosive Rounds:

High Explosive: Artillery Size:	Standard: Mega Damage:	Standard: Blast Radius:	Standard: Cost:	Rocket: Mega Damage:	Rocket: Blast Radius:	Rocket: Cost:
105 mm Howitzer	2D4x10	15 feet	600 Cr	1D6x10	10 feet	800 Cr
155 mm Howitzer	2D6x10	25 feet	2000 Cr	2D4x10	20 feet	2400 Cr
203 mm Howitzer	3D6x10	35 feet	5000 Cr	3D4x10	30 feet	6000 Cr

Armor Piercing

Armor Piercing: Artillery Size:	Standard: Mega Damage:	Standard: Blast Radius:	Standard: Cost:	Rocket: Mega Damage:	Rocket: Blast Radius:	Rocket: Cost:

105 mm Howitzer	2D6x10 [1]	4 feet	750 Cr	2D4x10 [1]	3 feet	900 Cr
155 mm Howitzer	3D6x10 [1]	6 feet	2200 Cr	2D6x10 [1]	5 feet	2800 Cr
203 mm Howitzer	4D6x10 [1]	10 feet	6000 Cr	3D6x10 [1]	8 feet	7000 Cr

[1] Due to the weapons high penetration, warheads inflict critical strikes (double damage) on natural 18, 19, and 20

Plasma

Plasma Artillery Size:	Standard: Mega Damage:	Standard: Blast Radius:	Standard: Cost:	Rocket: Mega Damage:	Rocket: Blast Radius:	Rocket: Cost:
105 mm Howitzer	3D4x10	20 feet	900 Cr	2D6x10	15 feet	1200 Cr
155 mm Howitzer	4D6x10	30 feet	2500 Cr	3D6x10	25 feet	3200 Cr
203 mm Howitzer	5D6x10	40 feet	7500 Cr	4D6x10	35 feet	9000 Cr

Incendiary:
Incendiary inflicts less damage than other warhead types but instead burns for several melees. An Incendiary burns for 6 melees and does damage all 6 melees. The damage should be applied on the start of each melee that Incendiary is burning the target.

Incendiary Artillery Size:	Standard: Mega Damage:	Standard: Blast Radius:	Standard: Cost:	Rocket: Mega Damage:	Rocket: Blast Radius:	Rocket: Cost:
105 mm Howitzer	4D6	4 feet	800 Cr	3D6	3 feet	1100 Cr
155 mm Howitzer	6D6	6 feet	2300 Cr	5D6	5 feet	3000 Cr
203 mm Howitzer	1D4x10	10 feet	6500 Cr	6D6	8 feet	8000 Cr

Smoke:
Use the blast radius of smoke for knockout gas, tear gas, and fire regardant as well.

Smoke: Artillery Size:	Standard: Mega Damage:	Standard: Blast Radius:	Standard: Cost:	Rocket: Mega Damage:	Rocket: Blast Radius:	Rocket: Cost:
105 mm Howitzer	None	30 feet	50 Cr	None	20 feet	150 Cr
155 mm Howitzer	None	40 feet	200 Cr	None	30 feet	400 Cr
203 mm Howitzer	None	50 feet	800 Cr	None	40 feet	1200 Cr

Cluster Munition:
Cluster Munition warheads work by dispersing numerous sub-munitions. Each sub-munition is a small grenade-like bomb. These bombs impact all over the target area causing massive amounts of damage. These are used against runways, highways, bridges, and sometimes large fuel tanks. If used against a runway, highway or bridge, the bombs will crater the entire target area. This will cause a runway to become unusable and highways and bridges to be very dangerous to traverse.

Cluster Munition Artillery Size:	Standard: Mega Damage:	Standard: Blast Radius:	Standard: Cost:	Rocket: Mega Damage:	Rocket: Blast Radius:	Rocket: Cost:
105 mm Howitzer	5D6 [2]	5 feet	800 Cr	5D6 [2]	5 feet	1100 Cr
155 mm Howitzer	5D6 [2]	5 feet	2300 Cr	5D6 [2]	5 feet	3000 Cr
203 mm Howitzer	5D6 [2]	5 feet	6500 Cr	5D6 [2]	5 feet	8000 Cr

[2] This weapon works by distributing (100 for 105 mm standard, 75 for 105 mm rocket assisted, 200 for 155 mm standard, 150 for 155 mm rocket assisted, 300 for 203 mm standard, and 200 for 203 mm rocket assisted) grenade type bombs on the target. Each grenade does 5D6 MD to a 5 ft radius. All of the grenades are dispersed in a radius on target, thus causing widespread damage. 105 mm standard create an area 40 feet in diameter, 105 mm rocket assisted creates an area 30 feet in diameter, 155 mm standard create an area 60 feet in diameter, 155 mm rocket assisted creates an area 50 feet in diameter, 203 mm standard creates an area 80 feet in diameter, and 203 mm rocket assisted creates an area 60 feet in diameter.

Top-Attack Anti-Armor:
Top-attack anti-armor (TA3) artillery rounds are designed to strike armored vehicles from above, where they are most vulnerable. These artillery rounds work by delivering what is known as an explosively-formed-projectile or EFP. These EFPs travel at velocities in excess of 6,560 ft/s (2,000 m/s)

and are usually capable of punching through the relatively thin upper armor of many vehicles. These munitions are also sometimes used against underground bunkers and fuel storage

Anti-Armor Artillery Size:	Standard: Mega Damage:	Standard: Blast Radius:	Standard: Cost:	Rocket: Mega Damage:	Rocket: Blast Radius:	Rocket: Cost:
105 mm Howitzer	2D4x10 [3]	5 feet	800 Cr	2D4x10 [3]	5 feet	1100 Cr
155 mm Howitzer	2D4x10 [3]	5 feet	2300 Cr	2D4x10 [3]	5 feet	3000 Cr
203 mm Howitzer	2D4x10 [3]	5 feet	6500 Cr	2D4x10 [3]	5 feet	8000 Cr

[3] TA3 warheads will penetrate the armor if the damage done equals or exceeds 30% of the total armor of the area being attacked. If an EFP penetrates, all targets inside, including equipment, take one-third damage.

For number of warheads, 155 mm artillery using the TA3 warhead actually carry two EFPs and 203 mm artillery using the TA3 warhead actually carry four EFPs. Each EFP, once deployed, is capable of attacking a separate target independently within 75 ft (22.9 m) of dispersal. EFPs will automatically attack separate targets unless there are fewer targets than there are warheads are present, in which case all targets will be attacked with multiple hits on the largest target.

Deployable Minefield:
Deployable minefield artillery shells are used to deliver mines in front of, behind, or even on top of enemy troops. Minefields will usually severely slow down advancing troops as they attempt to either clear or bypass the field. This time can be used by friendly troops to regroup, attack, or any of a number of things.

Anti-Personnel Artillery Size:	Standard: Mega Damage:	Standard: Blast Radius:	Standard: Cost:	Rocket: Mega Damage:	Rocket: Blast Radius:	Rocket: Cost:
105 mm Howitzer	7D6 [4]	20 feet	800 Cr	7D6 [4]	20 feet	1100 Cr
155 mm Howitzer	7D6 [4]	20 feet	2300 Cr	7D6 [4]	20 feet	3000 Cr
203 mm Howitzer	7D6 [4]	20 feet	6500 Cr	7D6 [4]	20 feet	8000 Cr

[4] 105 mm standard delivers 50 mines covering an area 150 ft (45.7 m) in diameter and 105 mm rocket assisted delivers 40 mines covering an area 100 feet (30.5 m) in diameter. 155 mm standard delivers 100 mines covering an area 200 ft (61 m) in diameter and 155 mm rocket assisted delivers 80 mines covering an area 150 ft (45.7 m) in diameter. 203 mm standard delivers 200 mines covering an area 300 ft (91.4 m) diameter and 203 mm rocket assisted delivers 160 mines covering an area 200 ft (61 m) in diameter.

Anti-personnel mines will be triggered by pressure of over 100 lb (45 kg) within 15 ft (4.6 m).

Anti-Armor Artillery Size:	Standard: Mega Damage:	Standard: Blast Radius:	Standard: Cost:	Rocket: Mega Damage:	Rocket: Blast Radius:	Rocket: Cost:
105 mm Howitzer	1D4x10 [5]	20 feet	800 Cr	1D4x10 [5]	20 feet	1100 Cr
155 mm Howitzer	1D4x10 [5]	20 feet	2300 Cr	1D4x10 [5]	20 feet	3000 Cr
203 mm Howitzer	1D4x10 [5]	20 feet	6500 Cr	1D4x10 [5]	20 feet	8000 Cr

[5] Number of warheads and radius is identical to anti-personnel mines but the Anti-vehicle mines will be triggered by pressure of over 400 lb (180 kg) within 15 ft (4.6 m).

Illumination:
Illumination warheads deliver parachute-suspended flare type lights or "candles". These provide illumination over a battlefield for at least a limited amount of time.

Illumination: Artillery Size:	Standard: Mega Damage:	Standard: Blast Radius:	Standard: Cost:	Rocket: Mega Damage:	Rocket: Blast Radius:	Rocket: Cost:
105 mm Howitzer	None [6]	200 feet	200 Cr	None [6]	150 feet	300 Cr
155 mm Howitzer	None [6]	500 feet	600 Cr	None [6]	400 feet	700 Cr
203 mm Howitzer	None [6]	1000 feet	1000 Cr	None [6]	800 feet	1200 Cr

[6] Multiple candles are released from the warheads. The illumination will last for 10 melees (2.5 minutes).

General Rules:

Flight Time:
Without trying to make the system incredibly complex, Artillery rounds take 1 melee for every ten miles they travel.

Terms:
Direct Fire: The artillery is being fired directly on a target with no angle. Some artillery can be used as anti-aircraft weapons and this is the way they are operated when used in this role. In these cases, the gunner has full bonuses and does not use the special targeting tables

Indirect Fire: In this case the artillery is fired at an angle upwards and comes down onto the target. The rules after this are applied to indirect fire.

Rolling to strike:
The author has kept these rules simple for ease of use. If anyone can come up with a better systems that is still relatively simple, I would be willing to modify these rules. Unless artillery is being used for direct fire, first roll to strike as an unmodified roll except weapon systems gives a +1 to strike if roll is made. Having a spotter or automated observation equipment will increase bonuses to strike as well and reduce penalties. There are also special guided projectile that will home on a laser or radar beam. If these are used, do not use this system but instead have the person using the radar targeting system roll with their normal bonuses.

Target Numbers:
To strike an individual target: 12 or greater is needed,
To hit an Area: 8 or greater is needed

Penalties to Strike:
Choose only one Wind condition and one Precipitation / Fog condition base on the conditions on the battlefield. Fog may also include heavy smoke or dust. The conditions are then combined together for any penalties (if any) to be applied to gunnery rolls. The rules on target detection should also be used to determine if the target is spotted to be fired at in the first place

Wind:
Moderate Wind: -1 to Strike
Heavy Wind: -2 to Strike
Very Heavy Wind: -3 to Strike
Precipitation / Fog:
Moderate Fog / Moderate Rain: -1 to Strike:
Heavy Fog / Heavy Rain: -2 to Strike
Very Heavy Fog / Very Heavy Rain: -3 to Strike

Walking Onto Target:
Normally, the first strike of artillery will miss and the person firing must correct for this using data from an observer or via direct observation. If the person only has one set of target and no ability to refine the targets location, the gunner will get no bonuses to strike a target and will have a -4 penalty to strike moving targets with no bonuses as well including for weapon systems skill roll. The ability to strike moving target is limited, assume that targets that are traveling over 50 mph (80.5 kph) have no bonuses and targets that are traveling over 100 mph (161 kph) are unable to be hit by artillery except on direct fire.

Direct Observation:
This is if the gunnery crew has visual on the target. This does not include spotting using reconnaissance equipment. The big item to remember is that if you can see them, they can see you.
The gunners must have the skills of Navigation (cannot be Land Navigation), Read Sensory Equipment, and Weapon Systems. For each shot after the first, the gunner has a +1 to strike for every three rounds to hit an unmoving target and the gunner has a +1 to strike for every six rounds to hit a moving target

Using Spotter or Reconnaissance Equipment:

This is if the gunnery crew has a spotter in the field or reconnaissance equipment such as a min-aircraft doing spotting. In these cases, the gunner has no direct observation of the target. These bonuses with a -2 penalty can also be used for return fire. This is using the other artillery being fired at you to target that artillery. In that case, ignore the skills needed for the spotter.
The gunners must have the skills of Navigation (cannot be Land Navigation), Read Sensory Instruments, Radio: Basic, and Weapon Systems. If using a spotter, the spotter must have the skills of Navigation (cannot be Land Navigation) and Radio: Basic. For each shot after the first, the gunner has a +1 to strike for every four rounds to hit an unmoving target and the gunner has a +1 to strike for every eight rounds to hit a moving target.

Using Both:
This means that the gunnery crew has the ability to see the target but has an observing or observation equipment as well. These give you the best bonuses. Like just direct observation, the big item to remember is that if you can see them, they can see you.
The gunners must have the skills of Navigation (cannot be Land Navigation), Read Sensory Instruments, Radio: Basic, and Weapon Systems. If using a spotter, the spotter must have the skills of Navigation (cannot be Land Navigation) and Radio: Basic. For each shot after the first, the gunner has a +1 to strike for every two rounds to hit an unmoving target and the gunner has a +1 to strike for every four rounds to hit a moving target.

Misses:
Artillery often misses but the effects of the miss can still be effective.

How to determine where shell strikes:

Roll on eight sided die.

Roll	Direction
1	North
2	North East
3	East
4	South East
5	South
6	South West
7	West
8	North West

For every point that the strike roll was under the target number, the round will miss the intended target by 50 feet (15.2 m).

Note: If the target is within the blast or strike radius of the round, then the target still takes damage as appropriate

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Return

Free Quebec SAMAS augmentation pack:

While Free Quebec has the ability to convert their factories to completely new flying power armor designs, this would have been both expensive and caused manufacturing to stop while retooling at what could be a critical time. Instead, Free Quebec opted for upgrading their SAMAS with augmentation of extra mini missile launnher. The SAMAS only need to have fire control upgrades and some mounting racks put on it to take advantage of the new weapon systems for this. The system was inspired by the Coalition's new Striker SAMAS but is much simpler. The augmentation includes six mini-missile launchers on each wing and two mini missile launchers outside of each knee. This increase the number of mini missiles carried from two on the original to eighteen with the extra mounting racks. The only real disadvantage of the additional missile launchers that it reduces the power armors top speed when fully loaded.

A side not is that the SAMAS of the productions lines in Free Quebec no longer have the Skull features and look much the original SAMAS design did. This was done to conserve resources and the military no longer has the need to use the Skull Motiff. These can use the Augmentation pack along with most SAMAS designs. The main models that could not without major modifications are the New CS SAMAS.

Weight: 32 lbs (14.5 kg) unloaded and 80 lbs (36.3 kg) fully loaded
Mega-Damage: By mini-missile type (Use modified missile table)
Rate of Fire: One at a time or in volleys of 2 or 4.
Maximum Effective Range: Varies by mini missile type (Use modified missile table)
Payload: 16 mini-missiles (forearm mini missiles make a grand total of 18 mini-missiles)
Penalties: -10% to top speed when fully loaded while flying, does not effect the Power Armors ground movement
Black Market Cost: 225,000 credits

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Return

Equipment of the R.E.E.F.

Armor:

Improved CVR-3 Series Cyclone Body Armor:

The engineers at Florida Base realized that they could improve the CVR-3 Body armor by using the new materials available especially the alloys used in the Coalition's new body armor types. The REEF was able to acquire a sample and create a modified version of the CVR-3 body armor. The alloy was modified so that the body armor would be resistant to laser weaponry (The suit takes half damage). The suit may still be used with cyclones but is available in a light and a heavy style. CVR-3B is the light style and CVR-3C is the heavy style.

M.D.C.: CVR-3B Light Cyclone Body Armor gives 75, CVR-3C Heavy Cyclone Body Armor gives 100, and both are laser resistant (Lasers do half damage).

Weight: 9 lbs (4.1 kg) for CVR-3B Light Armor and 15 lbs (6.8 kg) for CVR-3C Heavy Armor.

Mobility: No prowl penalty for CVR-3B Light Armor and Good mobility (-10% prowl) for CVR-3C Heavy Armor.

Features:

- Complete environmental battle armor suitable for use in space and other hostile environments.
- Computer controlled life support system.
- Internal cooling and temperature control.
- Artificial air circulation systems, gas filtration, and humidifier.
- Computer controlled, independent oxygen supply and purge system that automatically engages in low oxygen or contaminated air environments. Eight hour oxygen supply maximum.
- Insulated, high temperature resistant shielding for up to 300 degrees centigrade. Normal fires do no damage but Nuclear, Plasma, and magic fires do full damage.
- Radiation shielded.
- Polarized and light sensitive/adjusted tinted visor with additional sensors and advanced optics: Passive nightvision with 2,000 foot/610 m range, telescopic enhancement with 5 x magnification and 6,000 ft/1,820 m range, Laser distancer with 2,000 ft/610 m range, and Laser Targeting that gives +1 strike bonus with 2,000 ft/610 m range.
  Directional short range radio built into helmet. Range is 5 miles (8 km.)
- Helmet with removable faceplate
- Wrist and Helmet Mini-Computer: A multi-purpose miniature computer and display that will indicate system errors within the armor, damage levels, and oxygen supply, as well as directions (Compass), calculator, time, date, air pressure, and radiation.

Black Market Cost: Very rarely if every available

Weapons:

Gallant H-90B:

Modified version of the Gallant H-90 with the main additional feature of controlled burst firing, slightly better ranges, and slightly more powerful in pistol mode. It has been fitted to use standard Rifts long E-Clips in rifle mode but still uses a special Mini E-Clip in pistol form. The weapon has the addition of a three round burst setting in both pistol and rifle mode. The weapon still retains the ability to fire longer bursts. Like the original weapon, the base weapons is a pistol but with the addition of additional barrel length and a stock with power boosting equipment built in becomes a powerful energy rifle. The final addition is an integral laser targeting system and optional cyber-link equipment. The weapon may be fitted with a vibro bayonet in rifle mode. This weapon is slowly replacing the M-160 in REEF service

Weight:

1.8 lbs (.8 kg) for pistol section
7.8 lbs (3.5 kg) for assembled rifle (Vibro Bayonet adds an additional 2 lbs (.9 kg)

Mega-Damage:

Pulse Energy Pistol: 2D6 for single shot or 6D6 for a rapid fire burst of three shots virtually simultaneously.
Pulse Energy Rifle: 4D6 for single shot or 1D6x10+10 for a rapid fire burst of three shots virtually simultaneously.
Vibro-Dagger: 1D6

S.D.C. Damage: *Pistol or Rifle Mode:* 4D6 for single shot or 1D6x10+10 for a rapid fire burst of three shots virtually simultaneously
Rate of Fire: Single Shot, Three Round Burst, and Extended Bursts (Use standard burst rules).
Maximum Effective Range: *Pulse Energy Pistol:* 800 ft (244 m), *Pulse Energy Rifle:* 2000 ft (610 m)
Payload: *SDC:* 500 shots, *Pulse Energy Pistol:* 15 shots from mini E-Clip, *Pulse Energy Rifle:* 30 shots (uses Rifts standard long E-Clip in stock)

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Return

R.E.E.F. Aircraft Hard point Pods & Ordnance Loads

Most R.E.E.F. aircraft has hard points. Unless it states otherwise, the hard points can carry a variety of bomb, missiles, missile pods, weapons pods, and/or various electronic passages. Normally hard points will be filled in pairs. Gun pods can be linked with each other and/or with internal weapons systems to increase damage. Torpedoes are treated like missiles and can be carried on hard points in the same numbers. Because of the size of extra-heavy bombs, they cannot be carried by wing hard points. If an aircraft is carrying ordnance on Hard Points, aircraft speed is reduced by 10%.

1. **Missiles and Bombs:** The REEF hard points can carry a variety of different ordnances on a hard point. The only restriction is that a hard point must carry all the same type of missile and missile. Both unguided and guided bombs can be carried. In two pilot vehicles, short range missile racks are controlled by either the pilot or the weapons officer.
   Effective Range: Varies by missile type for missile and varies by altitude dropped at (See bomb and missile tables for details).
   Mega Damage: Varies by missile or bomb type (See bomb and missile tables for details).
   Rate of Fire: Missile can be fire and bombs can be dropped one at a time or in volleys of 2, 3, or 4 per hard point (up to
   payload of hard point). Multiple hard points can be linked as one attack but must be the same size (light, medium, or heavy)
   and style of ordnance (all missiles or bombs in a volley)
   Payload: 4 short range missile or light bombs, 2 medium range missiles or medium bombs, or 1 long range missile or heavy bomb (all ordnance on a hard point must be the same size and type of ordnance).
2. **Heavy Rail Wing Gun Pod:** A long range and heavy damaging weapon that is designed to add to the aircrafts firepower. The weapon is also very effective against targets that are impervious to energy. It is designed using a Shemarrian Rail gun and ammo and putting it into a special weapon pod. Rail Gun pods can be fired individually or together. In two pilot vehicles, rail gun is are controlled by the pilot.
   Effective Range: 6,000 ft (1,828 m)
   Mega-Damage: 2D6x10 M.D. per round, each gun pod adds an additional 2D6x10 M.D.
   Rate of Fire: Equal to number of combined hand to hand attacks (usually 4-6) fired as aimed or Wild Each gun pod can be combined with others or internal weapon systems and still costs one attack.
   Payload: 440 rounds (2 belts of 220 rounds)
   Bonuses: +2 to Strike
3. **Mini-Missile Pod:** Large capacity mini-missile pod. The Aircraft normally carries missile pods for ground strafing, anti-troop, and anti-emplacement attacks. Normal missile used are armor piercing, plasma, fragmentation, or concussion mini-missiles. In two pilot vehicles, mini missile pods are controlled by the pilot
   Range: Varies with missile types, mini-missiles only.
   Damage: Varies with missile types.
   Rate of fire: Each pod can fire one at a time or in volleys of 2, 4, 8, 16, or 24 and can be linked with other mini missile pods for greater number of missiles (Counts as one attack no matter how many missiles in volley)

Payload: each pod carries 24 mini-missile.

4. **Jamming Pods:** Similar system to internal jamming equipment carried of Hurricane Alpha Fighters. Jams all radars, radio communications, and electromagnetic sensors including friendly forces and aircrafts sensors when activated. Activating jamming pods does not cost an attack.
   Range: Each pod increases range by a 20 mile (32.2 km) radius per Jamming pod.
   Effects: When activated, radio communications, radars, and electromagnetic sensors are reduced in range by 95% . Laser communications and light-based sensors are unaffected by jamming. Jamming also causes -8 to all radar guided weapons with Jamming. Some missile will home on jamming and will go after aircraft carrying them.
5. **Sonar Pod:** Pod designed to give Veritechs better sensor ability underwater. The sensor includes a passive sonar, active sonar, and an underwater communication unit. Active sonar and an underwater communication unit when being use can be detected by any vehicle using passive sonar when within their sonar range. Sonar can track up to 280 simultaneously and identify up to 120 of them. The sonar equipment has a unit that can be lower into water while hovering or flying up to 30 mph (26 knots/ 48 km) per hour. Often for Anti Submarine Warfare (ASW) operation, this pod is carried with a MAD pod
   Range: Passive Sonar: 8 mile (12.8 km) Active Sonar: 12 miles (19.3 km) milse Underwater Communication: 4 miles (6.4 km)
6. **M.A.D. Pod:** This is special pod that has the ability to detect metal objects. M.A.D. stands for Magnetic Anomaly Detector. This is very effective at detecting submarines.
   Range: 2 miles (3.2 km) to either side of aircraft.
7. **Radar Image Enhancement:** This is a special pod that allows the ship to increase the vehicles radar image, allowing it to trick missiles going towards another target and deceiving someone who is using radar.

R.E.E.F. Hard Point Pods & Ordnance Loads based on Versatile Weapon Configuration system from Robotech: RPG book Eight: Strike Force by Wayne Breaux Jr.

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Return

Revised and Expanded Missile & Bomb Tables

Or:
The Net-Book of Ordnance and General Destruction

(Version 2.1 - Last modified: 05/06/98)

Both missiles and bombs have been used in warfare since well before the first World War. Early designs were usually inefficient and often didn't work well. As time passed, both missile and bomb technology grew greatly. By the late twentieth century, it was possible to aim the weapons remotely with accuracies of within less than three meters. Use of inertial,GPS, and other types of navigation later enabled even more precise targeting.

The ability to carry missiles or bombs gives a vehicle a high degree of versatility in the amount and combinations of firepower it can carry into combat. Several special types of missiles can be carried in addition to normal, conventional (general purpose) missiles. These include air-to-air, air-to-ground, and surface-to-air missiles.

In addition to these types, various kinds of warheads can be placed on the different missile types. Warheads can vary from smoke or tear gas to high explosive or even thermonuclear warheads.

Bombs, though not quite as diverse as missiles in type, can also use a multitude of warheads. For their size, bombs can carry a larger payload than comparative missiles.

This netbook is designed to both replace and expand upon the missile table presented in the *Rifts® Main Book*. The original statistics presented were far from realistic and quite often rediculous. The tables and articles in this netbook are intended to be used for **Rifts® Earth**. Phase World™ and other advanced settings are **not** covered and would normally have more powerful and advanced weaponry (including perhaps anti-matter and gravity-based weapons).

Below are articles covering the destructive power, ranges, speeds, and other statistics of different types of missiles and bombs available.

1. Conventional Missiles: mini-, short-, medium-, long-range, and cruise-missiles.

2. Specialty Missiles: air-to-air, air-to-ground, and surface-to-air missiles.

3. Special Warheads: cluster, deployable minefields, and more.

4. Conventional Bombs: conventional bombs.

5. NEW! Special Bombs: cluster, deployable minefields, and fuel air explosives.

6. Thermonuclear Weapons: thermonuclear missiles and bombs.

7. NEW! Weapon Guidance: different guidance types and availability.

8. NEW! Gary Gore's article on Nuclear Weapons: detailed data on nuclear weapons.

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With help from Mad Dog (maddog1@Alaska.NET) and
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Conventional Missiles table based off of UN Spacy missile tables by Dave Deitrich.

Conventional Missiles

All standard missiles are available in either guided or unguided versions. **Guided missiles** use sensors to home in on the intended target once locked and launched. See the Weapon Guidance article for more information on different guidance types and availability.

Unguided missiles (essentially rockets) are dumb-fire missiles without sensors and thus have no bonus to hit. However, since unguided missiles don't carry tracking systems they have extra room for fuel and more powerful engines (increase speed by 20% and range by 50%). Remember that missiles do NOT benefit from the strike bonuses of the pilot unless specifically noted.

New Rule: The damages listed are for being caught within the blast radius of the explosion. Everything within the blast radius takes the damage listed. If the missile hits the target directly, double damage is taken. To determine whether the target was hit directly, use the **natural**, unaugmented, strike roll. If the roll was 18, 19, or 20 then the target was hit directly, otherwise it was only caught in the blast radius. Effectively, this means that in this case critical strikes are on a roll of 18, 19, or 20 instead of only the normal 20.

Smart Missiles:

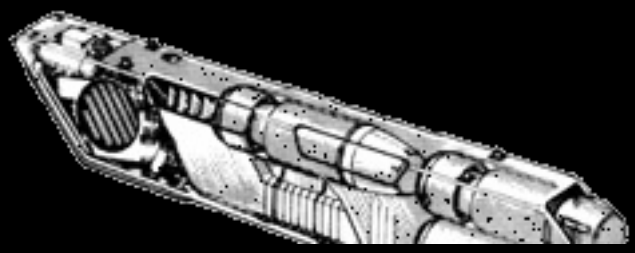
Some of the larger missiles are available as **smart missiles**. These smart missiles have advanced tracking and avoidance systems that give them a +5 to strike, +4 to dodge, and 2 attacks per melee until they strike their target or run out of fuel. Missiles will run out of fuel 1 minute after engaging the target. In other words, the missile has 4 melees or 8 attacks to strike the target. **Smart missiles cost an extra 40,000 credits** (i.e. add 40,000 to the price). See the Weapon Guidance article for more information.

Fusion Warheads:

Fusion warheads are non-nuclear explosives that are much more powerful than other warheads of comparable size. Generally, only nuclear weapons are more powerful for their size. Fusion warhead technology is quite advanced, therefore only the most high-tech nations and city-states (such as CS, NGR, Republic of Japan) will possess these. These weapons do not emit deadly radiation, an EMP, or any of the other side-effects normally associated with nuclear weapons. (Please note that the term "fusion" is not meant to imply a fusion reaction.)

Mini Missiles

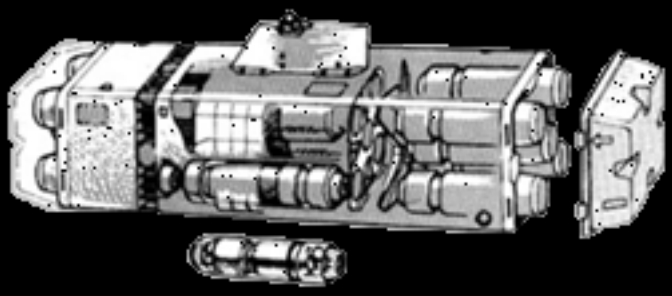
Mini-missiles (MMs) are small rockets the size of a mortar round or bazooka shell. Some robots and vehicles carry large quantities of MMs



allowing them to fire enormous spreads of missiles that can surprise and often damage or disable enemies. Because of their small size, MMs are **NOT** available as smart missiles, though some forms of guidance are available.

Warhead	Damage	Speed	Maximum Range	Blast Radius	M.D.C.	Price
High Explosive	1D4x10	500mph (804kmph)	1 mile (1.6km)	5ft (1.5m)	1	800
Fragmentation	1D4x10	500mph (804kmph)	1/2 mile (0.8km)	20ft (6.1m)	1	800
Armor Piercing	1D6x10	1400mph (2251kmph)	1 mile (1.6km)	3 t (0.9m)	1	2000
Plasma/Heat	2D4x10	1200mph (1929kmph)	1 mile (1.6km)	15ft (1.5m)	1	2000
Tear Gas	None	500mph (804kmph)	1/2 mile (0.8km)	20ft (6.1m)	1	500
Knock-Out Gas	None	500mph (804kmph)	1/2 mile (0.8km)	20ft (6.1m)	1	500
Smoke	None	500mph (804kmph)	1/2 mile (0.8km)	20ft (6.1m)	1	500
Fire Retardent	None	500mph (804kmph)	1/2 mile (0.8km)	20ft (6.1m)	1	500

Short Range Missiles

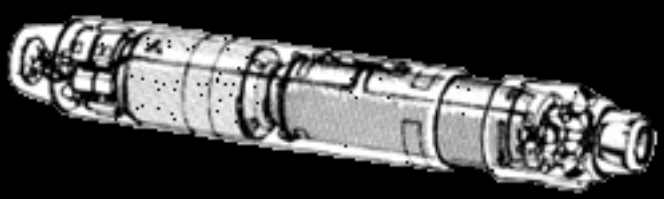


Short Range Missiles (SRMs) are intended as anti-armor armaments for use in close-range engagements and fighter combat. They are small enough that groups of them can be mounted in clusters, or inside the body of a vehicle where they are protected until needed. SRMs are **NOT** normally available as smart missiles (only specialty missiles could be considered "smart"), though some forms of guidance are available.

Warhead	Damage	Speed	Maximum Range	Blast Radius	M.D.C.	Price
High Explosive (light)	1D4x10	700mph (1127kmph)	4 miles (6.0km)	10ft(3m)	5	1800
High Explosive (medium)	1D6x10	700mph (1127kmph)	3 miles (4.8km)	15ft (4.6m)	5	2000
High Explosive (heavy)	2D4x10	700mph (1127kmph)	2 miles (3.2km)	20ft (6.1m)	5	2200
Fragmentation (light)	1D4x10	600mph (966kmph)	2 miles (3.2km)	20ft (6.1m)	5	1800

Fragmentation (medium)	1D6x10	600mph (966kmph)	1.5 miles (2.4km)	25ft (7.6m)	5	2000
Fragmentation (heavy)	2D4x10	600mph (966kmph)	1 mile (1.6km)	30ft (9.1m)	5	2200
Armor Piercing (light)	1D4x10	900mph (1448kmph)	6 miles (9.6km)	5ft (1.5m)	5	4000
Armor Piercing (medium)	1D6x10	900mph (1448kmph)	5 miles (8km)	5ft (1.5m)	5	4500
Armor Piercing (heavy)	2D6x10	800mph (1287kmph)	2.5 miles (4km)	5ft (1.5m)	5	5000
Plasma/Napalm (light)	1D4x10	800mph (1287kmph)	4 miles (6.0km)	10ft (3m)	5	4000
Plasma/Napalm (medium)	1D6x10	700mph (1127kmph)	3 miles (4.8km)	15ft (4.6m)	5	4500
Plasma/Napalm (heavy)	2D6x10	700mph (1127kmph)	1.5 miles (2.4km)	25ft (7.6m)	5	5000
Tear Gas	None	450mph (724kmph)	1/2 mile (.8km)	30ft (9.1m)	5	1500
Knock-Out Gas	None	450mph (724kmph)	1/2 mile (0.8km)	30ft (9.1m)	5	1500
Smoke	None	450mph (724kmph)	1 mile (1.6km)	30ft (9.1m)	5	1500
Fire Retardent	None	450mph (724kmph)	1/2 mile (0.8km)	30ft (9.1m)	5	1500

Medium Range Missiles



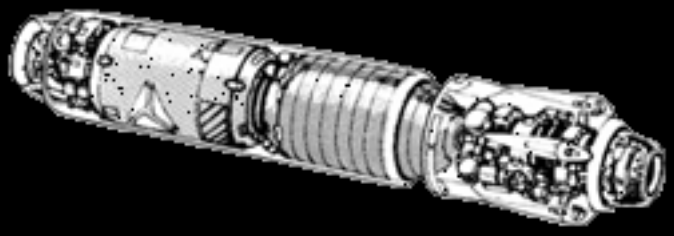
Medium Range Missiles (MRMs) often make up the bulk of missile armaments, at least on fighters. Intended for medium- to long-range engagements between robots, vehicles and small ships, these missiles are usually mounted externally and launched in the initial seconds of combat.

Warhead	Damage	Speed	Maximum Range	Blast Radius	M.D.C.	Price

High Explosive (light)	1D6x10	1500mph (2411kmph)	50 miles (80.4km)	20ft (6.1m)	10	7000
High Explosive (medium)	2D4x10	1200mph (1929kmph)	40 miles (64.3km)	20ft (6.1m)	10	8500
High Explosive (heavy) *	2D6x10	1200mph (1929kmph)	40 miles (64.3km)	30ft (9.1m)	10	10,000
High Explosive (x-heavy) *	3D6x10	1000mph (1608kmph)	30 miles (48.2km)	30ft (9.1m)	10	12,000
Fragmentation (light)	1D6x10	1000mph (1608kmph)	50 miles (80.4km)	35ft (10.6m)	10	7000
Fragmentation (medium)	2D4x10	1000mph (1608kmph)	40 miles (64.3km)	40ft (12.2m)	10	8500
Fragmentation (heavy) *	2D6x10	1000mph (1608kmph)	30 miles (48.2km)	50ft (15.2m)	10	10,000
Fragmentation (x-heavy) *	4D4x10	800mph (1287kmph)	20 miles (32.2km)	60ft (18.2m)	10	12,000
Armor Piercing (light)	1D6x10	1800mph (2892kmph)	70 miles (112.7km)	10ft (3m)	10	15,000
Armor Piercing (medium)	2D4x10	1600mph (2571kmph)	60 miles (80.4km)	15ft (4.6m)	10	17,000
Armor Piercing (heavy) *	3D6x10	1500mph (2411kmph)	50 miles (80.4km)	20ft (6.1m)	10	20,000
Plasma/Napalm (light)	2D4x10	1500mph (2411kmph)	50 miles (80.4km)	30ft (9.1m)	10	15,000
Plasma/Napalm (medium)	2D6x10	1400mph (2251kmph)	40 miles (64.3km)	40ft (12.2m)	10	17,000
Plasma/Napalm (heavy) *	4D6x10	1200mph (1929kmph)	20 miles (32.1km)	50ft (15.2m)	10	20,000
Multi-Warhead (light)	2D4x10	1500mph (2411kmph)	80 miles (128.7km)	20ft (6.1m)	10	35,000
Multi-Warhead (heavy) *	5D6x10	1000mph (1608kmph)	50 miles (80.4km)	40ft (12.2m)	10	50,000
Smoke	None	1000mph (1608kmph)	40 miles (64.3km)	40ft (12.2m)	10	7500
Fire Retardent	None	1000mph (1608kmph)	40 miles (64.3km)	40ft (12.2m)	10	7500

* *Missiles are available as **Smart Missiles** (see above).*

Long Range Missiles



Long Range Missiles (LRMs) are generally the largest and most powerful missiles that can be carried by robots or vehicles. Intended for heavy anti-armor operations or for taking out groups of enemies, they are usually issued only in situations where heavy combat is unavoidable.

Warhead	Damage	Speed	Maximum Range	Blast Radius	M.D.C.	Price
High Explosive (light)	2D4x10	2500mph (4023kmph)	700 miles (1125km)	20ft (6.1m)	20	40,000
High Explosive (medium)	2D6x10	2010mph (3228kmph)	600 miles (965km)	30ft (9.1m)	20	45,000
High Explosives (heavy) *	3D6x10	1600mph (2571kmph)	500 miles (804km)	40ft (12.2m)	20	50,000
High Explosives (x-heavy) *	4D6x10	1600mph (2571kmph)	400 miles (643km)	50ft (15.2m)	20	65,000
Fragmentation (light)	2D6x10	1800mph (2892kmph)	600 miles (965km)	80ft (24.4m)	20	40,000
Fragmentation (heavy) *	3D4x10	1600mph (2571kmph)	400 miles (643km)	100ft (30.5m)	20	50,000
Armor Piercing (medium)	2D4x10	2500mph (4023kmph)	800 miles (1286km)	15ft (4.6m)	20	75,000
Armor Piercing (heavy) *	3D6x10	2500mph (4023kmph)	500 miles (804km)	30ft (9.1m)	20	100,000
Plasma/Napalm (light)	2D6x10	2010mph (3228kmph)	700 miles (1125km)	40ft (12.2m)	20	75,000
Plasma/Napalm (medium)	3D6x10	1800mph (2892kmph)	600 miles (965km)	50ft (15.2m)	20	85,000
Plasma/Napalm (heavy) *	4D6x10	1600mph (2571kmph)	500 miles (804km)	60ft (18.3m)	20	100,000

Plasma/Napalm (x-heavy) *	5D6x10	1600mph (2571kmph)	500 miles (804km)	80ft (24.4m)	20	120,000
Fusion (light) *	6D6x10	2500mph (4023kmph)	1400 miles (2249km)	80ft (24.4m)	20	150,000
Fusion (medium) *	1D4x100	2500mph (4023kmph)	1200 miles (1928km)	100ft (30.3m)	20	180,000
Fusion (heavy) *	1D6x100	2500mph (4023kmph)	1000 miles (1608km)	120ft (36.4m)	20	190,000
Fusion (x-heavy) *	2D4x100	2010mph (3228kmph)	1000 miles (1608km)	150ft (45.5m)	20	200,000
Fusion Multi-Warhead *	2D6x100	1800mph (2892kmph)	1200 miles (1928km)	200ft (61m)	25	240,000
Fusion Anti-Warship *	3D6x100	1400mph (2251kmph)	500 miles (804km)	400ft (121.9m)	25	300,000
** Missiles are available as **Smart Missiles** (see above).*						

Cruise Missiles

Cruise missiles (CMs) are generally the largest type of missile that can be carried by a craft. These missiles are extremely rare and expensive and thus will only be used when absolutely necessary, usually to take out large enemy ships or structures. CMs are only available in high-tech nations and city-states (such as CS, NGR, Republic of Japan). Each CM takes up two LRM slots in regards to carrying capacity and both slots must be together.

Warhead	Damage	Speed	Maximum Range	Blast Radius	M.D.C.	Price
Plasma/Napalm (heavy) *	1D4x100	2010mph (3228kmph)	1000 miles (1608km)	60ft (18.3m)	40	260,000
Plasma/Napalm (x-heavy) *	1D6x100	2010mph (3228kmph)	1000 miles (1608km)	80ft (24.4m)	40	300,000
Fusion (heavy) *	2D4x100	2500mph (4023kmph)	1200 miles (1928km)	120ft (36.4m)	40	420,000
Fusion (x-heavy) *	2D6x100	2010mph (3228kmph)	1200 miles (1928km)	150ft (45.5m)	40	500,000

Fusion Multi-Warhead *	3D6x100	1800mph (2892kmph)	1600 miles (2575km)	200ft (61m)	45	600,000
** Missiles are available as **Smart Missiles** (see above).*						

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Specialty Missiles

New Rule: The damages listed are for being caught within the blast radius of the explosion. Everything within the blast radius takes the damage listed. If the missile hits the target directly, double damage is taken. To determine whether the target was hit directly, use the natural, unaugmented, strike roll. If the roll was 18, 19, or 20 then the target was hit directly, otherwise it was only caught in the blast radius. Effectively, this means that in this case critical strikes are on a roll of 18, 19, or 20 instead of only the normal 20.

Air-to-Air Missiles

Air-to-Air missiles (AAMs) are one specific sub-category of normal missiles. These are carried by airborne units to use specifically against other airborne units. The missiles carry advanced targeting and maneuvering equipment as well as large engines. However, this results in the missiles being forced to carry a smaller payload. By far, the most useful and common warheads are usually fragmentation because of the larger blast radius, however, other types are available. All AAMs are "smart" and have special programming that gives +6 to strike, +5 to dodge, and 3 attacks per melee until they strike their target or run out of fuel. Missiles will run out of fuel 1 minute after engaging the target. In other words, the missile has 4 melees or 12 attacks to strike the target. Remember that missiles do NOT benefit from the strike bonuses of the pilot.

Warhead	Damage	Speed	Maximum Range	Blast Radius	M.D.C.	Price
High Explosive (SRM)	1D4x10	1500mph (2411kmph)	6 miles (9.6km)	15ft (4.6m)	5	55,000
High Explosive (MRM)	2D4x10	1800mph (2892kmph)	70 miles (112.7km)	30ft (9.1m)	10	62,000
High Explosive (LRM)	4D4x10	2500mph (4023kmph)	400 miles (643km)	60ft (18.3m)	20	100,000
Fragmentation (SRM)	1D4x10	1500mph (2411kmph)	6 miles (9.6km)	25ft (7.6m)	5	55,000
Fragmentation (MRM)	2D4x10	1800mph (2892kmph)	70 miles (112.7km)	50ft (15.2m)	10	62,000
Fragmentation (LRM)	3D4x10	2500mph (4023kmph)	400 miles (643km)	100ft (30.5m)	20	100,000

Plasma/Heat (SRM)	1D6x10	1500mph (2411kmph)	5 miles (8km)	15ft (4.6m)	5	58,000
Plasma/Heat (MRM)	2D6x10	1800mph (2892kmph)	60 miles (80.4km)	30ft (9.1m)	10	70,000
Plasma/Heat (LRM)	3D6x10	2500mph (4023kmph)	300 miles (483km)	50ft (15.2m)	20	150,000

Air-to-Ground Missiles

Air-to-Ground missiles (AGMs) are another sub-category of missiles. These are carried by airborne units to use specifically against ground targets such as buildings or vehicles. AGMs are in many ways similar to smart bombs. However, they have a much longer range, but lower damage capability due to their larger engine and guidance systems. If targeted properly, all AGMs will automatically hit a large stationary target like a building or bridge or blanket a specific area. They are "smart" and have special programming that gives a +6 to strike a moving target. Volleys can all strike the same target or they can each veer away to hit a different target. Remember that missiles do NOT benefit from the strike bonuses of the pilot.

Warhead	Damage	Speed	Maximum Range	Blast Radius	M.D.C.	Price
High Explosive (SRM)	1D4x10	700mph (1127kmph)	6 miles (9.6km)	15ft (4.6m)	5	50,000
High Explosive (MRM)	2D4x10	1400mph (2251kmph)	70 miles (112.7km)	30ft (9.1m)	10	58,000
High Explosive (LRM)	4D4x10	2010mph (3228kmph)	400 miles (643km)	60ft (18.3m)	20	90,000
Fragmentation (SRM)	1D4x10	700mph (1127kmph)	6 miles (9.6km)	25ft (7.6m)	5	50,000
Fragmentation (MRM)	2D4x10	1400mph (2251kmph)	70 miles (112.7km)	50ft (15.2m)	10	58,000
Fragmentation (LRM)	3D4x10	2010mph (3228kmph)	400 miles (643km)	100ft (30.5m)	20	90,000
Plasma/Heat (SRM)	1D6x10	700mph (1127kmph)	5 miles (8km)	15ft (4.6m)	5	55,000
Plasma/Heat (MRM)	2D6x10	1400mph (2251kmph)	60 miles (80.4km)	30ft (9.1m)	10	62,000

Plasma/Heat (LRM)	3D6x10	2010mph (3228kmph)	300 miles (483km)	50ft (15.2m)	20	135,000

Suface-to-Air Missiles

Surface-to-Air missiles (SAMs) are the third major sub-category of missiles. These weapons are carried by ground units to be used against airborne threats. They have virtually the same performance as AAMs, but are launched from the ground instead of the air. Use the same game statistics as the AAMs.

Back to Revised and Expanded Missile & Bomb Tables.

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Special Warheads

Most missiles used are not smart missiles. However, this does not mean that they do not have guidance systems. Missiles can employ a wide variety of different guidance systems. See the Weapon Guidance article for more information on different guidance types and availability.

Note: Unlike other missiles which often only damage through blast radius, the warheads described here do **not** inflict double damage on a direct hit. This is because either almost all of the hits are already direct, or being at the center of the explosion doesn't matter. Natural 20s still count as a critical strike.

Cluster

Cluster warheads work by dispersing numerous submunitions. Each submunition is a small grenade-like bomb. These bombs impact all over the target area cratering it, thus causing widespread damage. Historically, one of the more useful applications of these warheads was for disabling runways. The cluster munitions impact all over the runway, rendering it unusable. The runway must then be repaired before it is possible to use it again. Cluster missiles have become somewhat less useful, though, with the increasingly widespread use of VTOL aircraft.

Warhead	Damage	Speed	Maximum Range	Blast Radius	M.D.C.	Price
Cluster (MRM)	1D6x10 *	500mph (804kmph)	20 miles (32.2km)	5ft (1.5m)	10	25,000
Cluster (LRM)	1D6x10 *	1000mph (1608kmph)	200 miles (322km)	5ft (1.5m)	20	100,000

* This weapon works by distributing (100 for MRM, 200 for LRM) grenade type bombs to the target area. Each bomb does 1D6x10 MD to a 5 ft radius. The bombs are dispersed evenly within a 25ft radius for MRMs and a 35ft radius for LRMs.

Anti-Runway versions of the missiles are programmed slightly differently. All of the bombs are dispersed along a path down the runway, thus rendering is unusable. MRMs create a path 20ft wide by 75 ft long, LRMs create a path 30ft wide by 100 feet long.

Top-Attack Anti-Armor

Top-attack anti-armor (TA^3) missiles are designed to strike armored vehicles from above, where they are most vulnerable. These missiles work by delivering what is known as an *explosively-formed-projectile* or EFP. These EFPs travel at velocities in excess of 6560 ft/s (2000m/s) and are usually capable of punching through the relatively thin upper armor of many vehicles.

Warhead	Damage	Speed	Maximum Range	Blast Radius	M.D.C.	Price
Anti-Armor (MRM)	2D4x10 *	500mph (804kmph)	40 miles (64.4km)	5ft (1.5m)	10	30,000
Anti-Armor (LRM)	2D4x10 *	1000mph (1608kmph)	200 miles (322km)	5ft (1.5m)	20	125,000
* TA^3 warheads will **penetrate** the armor if the damage done equals or exceeds 30% of the remaining armor of the area being attacked. If an EFP penetrates, all targets inside, including equipment, take one-third inflicted damage.						
** Long-range missiles using the TA^3 warhead actually carry five EFPs. Each EFP, once deployed, is capable of attacking a separate target independently within 75ft (22.9m) of dispersal. EFPs will automatically attack separate targets unless fewer than 5 targets are present, in which case all targets will be attacked evenly with multiple hits on the largest target.						

Deployable Minefield

Deployable minefield missiles are used to deliver mines in front of, behind, or even on top of enemy troops. Minefields will usually severely slow down advancing troops as they attempt to either clear or bypass the field. This time can be used by friendly troops to regroup, attack, or any of a number of things.

Warhead	Damage	Speed	Maximum Range	Blast Radius	M.D.C.	Price
Anti-Personnel Minefield(MRM)*	7D6 **	600mph (966kmph)	50 miles (80.4km)	20ft (6.1m)	10	30,000
Anti-Personnel Minefield(LRM)*	7D6 **	1200mph (1929kmph)	400 miles (643km)	20ft (6.1m)	20	110,000
* MRMs deliver 50 mines covering a 150ft by 150ft (45.7m by 45.7m) area. LRMs deliver 100 mines covering a 200ft by 200 ft (61m by 61m) area. The delivery pattern ensures that the entire area is covered, with all areas within the trigger radius of at least one mine.						
** Anti-personnel mines will be triggered by pressure of over 100lb (45kg) within 15ft (4.6m).						
Anti-Vehicle Minefield (MRM)*	1D4x10 ***	600mph (966kmph)	50 miles (80.4km)	20ft (6.1m)	10	32,000

Anti-Vehicle Minefield (LRM)*	1D4x10 ***	1200mph (1929kmph)	400 miles (643km)	20ft (6.1m)	20	115,000
*** Anti-vehicle mines will be triggered by pressure of over 400lb (180kg) within 15ft (4.6m)						

Fuel Air Explosive

Fuel-Air Explosives (FAEs) are designed to cause massive damage by misting, then igniting a cargo of fuel. This detonation causes an incredible concussive effect. FAEs are much more effective against infantry or very lightly armored targets than against hard targets. One of the more useful aspects of the FAE is that the concussive effect is equal over virtually the entire blast radius. One unusual use for FAEs deals with minefields. The concussive pressure from the explosion will often either detonate pressure-sensitive mines or clear the dirt and earth off of them, making locating and disposing of them much easier.

Warhead	Damage	Speed	Maximum Range	Blast Radius	M.D.C.	Price
Fuel-Air Explosive (MRM)	4D4x10 * **	600mph (966kmph)	50 miles (80.4km)	75ft (22.9m)	10	22,000
Fuel-Air Explosive (LRM)	4D4x10 * **	1200mph (1929kmph)	400 miles (643km)	120ft (36.6m)	20	100,000
* Full damage is inflicted to all targets under 150 MDC. Targets possessing more MDC only take half damage.						
** Targets within the blast radius are likely (01-88%) to be knocked off their feet and stunned (01-65%). Targets knocked down will lose one melee action and initiative. Stunned targets are -10 to strike/parry/dodge/roll are the last to attack (no initiative) and lose half their attacks per melee for 1D4 rounds.						

Illumination

Illumination warheads deliver parachute-suspended flare type lights or "candles". These provide illumination over a battlefield for at least a limited amount of time.

Warhead	Damage	Speed	Maximum Range	Effect Radius	M.D.C.	Price
Illumination (MRM)	*	500mph (804kmph)	20 miles (32.2km)	1500ft (457m)	10	7500

Illumination (LRM)	*	1000mph (1608kmph)	200 miles (322km)	3500ft (1067m)	20	40,000
* Multiple candles are released from the warheads. The illumination will last for 10 melees (2.5 minutes).						

Electronic Jamming

This is a very specialized type of warhead. Instead of delivering a destructive payload, it deploys parachute-suspended jamming devices to interrupt battlefield control. The jamming covers a large portion of the electromagnetic spectrum and thus interferes with most forms of communication, radar, and other electromagnetic devices. Unfortunately, this also affects friendly forces in the area. However, with advanced notice friendly forces should be able to cope with the interruption while enemy forces will be caught by surprise and thrown into confusion.

Warhead	Damage	Speed	Maximum Range	Blast Radius	M.D.C.	Price
Jamming (MRM)	*	500mph (804kmph)	20 miles (32.2km)	200ft (61m)	10	8500
Jamming (LRM)	*	1000mph (1608kmph)	200 miles (322km)	500ft (152m)	20	45,000
* All communication or other sensor rolls are performed at -45% or operate at only 30% capability. Effects last for 20 melees (5 minutes).						

Laser Designating Devices

This is a very rare and expensive warhead. The warhead delivers several parachute-suspended laser designating devices. These devices will automatically illuminate or "paint" a target with a low-power laser. Laser-guided weapons are then able to home in on the target with pin-point precision. The laser designating devices possess advanced sensors which allow it to determine what is and isn't a target and give it an effective +6 to strike where applicable.

Warhead	Damage	Speed	Maximum Range	Blast Radius	M.D.C.	Price
Laser-Designator (MRM) *	**	500mph (804kmph)	20 miles (32.2km)	N.A.	10	30,000
Laser-Designator (LRM) *	**	1000mph (1608kmph)	200 miles (322km)	N.A.	20	120,000

* MRMs deliver enough devices to paint 5 targets within a 200ft (61m) radius, while LRMs deliver enough to paint 15 targets.

** **Special Rules:**
1) For stationary objects, a main body hit is always successful, as long as the missile homing in does not roll a "1" on launch.

2) Moving targets require a roll to hit (by the designator) on the action sequence that the missiles will hit. A natural 20 will result in a critical strike. However, there are penalties to the roll:

- *Speed:* -1 to strike per 10 mph/16 kmph of the target.
- *Smoke/Fog:* -2 to strike.
- *Target In Combat:* Double existing penalties.

Back to Revised and Expanded Missile & Bomb Tables.

By Chris Curtis (curtis@thepentagon.com).
With help from Mad Dog (maddog1@Alaska.NET) and
Kitsune (Kitsune@vabch.com).

Conventional Bombs

Most bombs used are not smart bombs. However, this does not mean that they do not have guidance systems. Bombs are able to use almost all of the guidance systems normally employed by missiles. See the Weapon Guidance article for more information on different guidance types and availability.

New Rule: The damages listed are for being caught within the blast radius of the explosion. Everything within the blast radius takes the damage listed. If the bomb hits the target directly, double damage is taken. To determine whether the target was hit directly, use the natural, unaugmented, strike roll. If the roll was 18, 19, or 20 then the target was hit directly, otherwise it was only caught in the blast radius. Effectively, this means that in this case critical strikes are on a roll of 18, 19, or 20 instead of only the normal 20.

Smart Bombs

Almost all of the bombs are available as **smart bombs**. These smart bombs have steering fins and a small rocket motor in addition to advanced targeting systems. With the rocket motor, they are even able to pursue a moving target. However, they are limited to a range of an extra one-half mile (0.8km) in addition to the normal drop altitude range. These bombs will automatically hit a large stationary target like a building or bridge or blanket a specific area. They have a +6 to strike a moving target. Volleys can all strike the same target or they can each veer away to hit a different target. Remember that bombs do NOT benefit from the strike bonuses of the pilot. **Smart bombs cost an extra 30,000 credits** (i.e. add 30,000 to the price). See the Weapon Guidance article for more information.

Fusion Warheads

Fusion warheads are non-nuclear explosives that are much more powerful than other warheads of comparable size. Generally, only nuclear weapons are more powerful for their size. Fusion warhead technology is quite advanced, therefore only the most high-tech nations and city-states (such as CS, NGR, Republic of Japan) will possess these. These weapons do not emit deadly radiation, an EMP, or any of the other side-effects normally associated with nuclear weapons. (Please note that the term "fusion" is not meant to imply a fusion reaction.)

Free-Fall Bombs

Unlike smart bombs, free-fall bombs cannot deviate to strike moving or alternate targets. Free-fall bombs do however, possess crude steering fins which can be used to steer the bomb toward the target. The horizontal range of a free-fall bomb depends upon the altitude from which it was dropped. The higher the altitude, the longer the possible range of the bomb. Because free-fall bombs do not need to devote space to rockets or guidance systems,

they can carry a slightly larger payload (increase damage and blast radius by 15%).

Drop Altitude	Maximum Horizontal Range
0-1000ft (0-305m)	100ft (30.3m)
1001-4000ft (306-1219m)	2500ft (762m)
4001-10000ft (1220-3048m)	5500ft (1676m)
10001-20000ft (3049-6096m)	10500ft (1.99 miles/3.2km)
20001-30000ft (6097-9144m)	16500ft (3.13 miles/5.03km)
30001-40000ft (9145-12192m)	22000ft (4.16 miles/6.7km)
40001-50000ft (12193-15240m)	28000ft (5.3 miles/8.5km)
50000+ft (15241+m)	33500ft (6.3 miles/10.2km)

Conventional Bombs (Non-Nuclear)

Conventional explosives make up the vast majority of bombs carried by aircraft. There exist a variety of types of bombs and each type usually comes in several sizes.

Note: When a description says it can carry **X** number of bombs, it can carry that many **heavy** bombs. Other bomb sizes can be carried in varying amounts:

- Light: Two light bombs may be carried per every space.
- Medium: Three medium bombs may be carried per every two spaces.
- Heavy: One heavy bomb may be carried per space.
- X-heavy: Two x-heavy bombs may be carried per every three spaces.

Warhead	Damage	Maximum Range	Blast Radius	M.D.C.	Price
High Explosive (light)	2D6x10	1/2 mile (0.8km)	30ft (9.1m)	10	7000
High Explosive (medium) *	3D6x10	1/2 mile (0.8km) *	40ft (12.2m)	15	12,000
High Explosive (heavy) *	4D6x10	1/2 mile (0.8km) *	50ft (15.2m)	25	20,000
High Explosive (x-heavy) *	5D6x10	1/2 mile (0.8km) *	60ft (18.2m)	35	30,000
Fragmentation (light)	2D6x10	1/2 mile (0.8km)	80ft (24.4m)	10	7500
Fragmentation (medium) *	3D4x10	1/2 mile (0.8km) *	100ft (30.3m)	15	11,000
Fragmentation (heavy) *	4D4x10	1/2 mile (0.8km) *	120ft (36.4m)	25	17,000
Fragmentation (x-heavy) *	4D6x10	1/2 mile (0.8km) *	150ft (45.5m)	35	22,000
Armor Piercing (light)	3D4x10	1/2 mile (0.8km)	5ft (1.5m)	10	15,000

Armor Piercing (medium) *	3D6x10	1/2 mile (0.8km) *	15ft (4.6m)	15	25,000
Armor Piercing (heavy) *	4D6x10	1/2 mile (0.8km) *	25ft (7.6m)	25	40,000
Armor Piercing (x-heavy) *	5D6x10	1/2 mile (0.8km) *	35ft (10.6m)	35	60,000
Plasma/Heat (light)	3D6x10	1/2 mile (0.8km)	15ft (1.5m)	10	20,000
Plasma/Heat (medium) *	4D6x10	1/2 mile (0.8km) *	30ft (9.1m)	15	38,000
Plasma/Heat (heavy) *	5D6x10	1/2 mile (0.8km) *	50ft (15.2m)	25	55,000
Plasma/Heat (x-heavy) *	6D6x10	1/2 mile (0.8km) *	80ft (24.4m)	35	75,000
Fusion (light) *	6D6x10	1/2 mile (0.8km) *	80ft (24.4m)	10	80,000
Fusion (medium) *	1D4x100	1/2 mile (0.8km) *	100ft (30.3m)	15	90,000
Fusion (heavy) *	1D6x100	1/2 mile (0.8km) *	120ft (36.4m)	25	105,000
Fusion (x-heavy) *	2D4x100	1/2 mile (0.8km) *	150ft (45.5m)	35	125,000
Tear Gas (medium) *	None	1/2 mile (0.8km) *	80ft (24.4m)	15	7000
Smoke (medium) *	None	1/2 mile (0.8km) *	80ft (24.4m)	15	7000
Fire Retardent (medium) *	None	1/2 mile (0.8km) *	80ft (24.4m)	15	7000
** Bombs are available as **Smart Bombs** (see above).*					

Back to Revised and Expanded Missile & Bomb Tables.

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Special Bombs

Most bombs used are not smart bombs. However, this does not mean that they do not have guidance systems. Bombs are able to use almost all of the guidance systems normally employed by missiles. See the Weapon Guidance article for more information on different guidance types and availability.

Note: Unlike other bombs which often only damage through blast radius, the special bombs described here do **not** inflict double damage on a direct hit. This is because either almost all of the hits are already direct, or being at the center of the explosion doesn't matter. Natural 20s still count as a critical strike.

Free-Fall Bombs

These special bombs are almost always free-fall bombs and thus cannot deviate to strike moving or alternate targets. Free-fall bombs do however, possess crude steering fins which can be used to steer the bomb toward the target. The horizontal range of a free-fall bomb depends upon the altitude from which it was dropped. The higher the altitude, the longer the possible range of the bomb.

Drop Altitude	Maximum Horizontal Range
0-1000ft (0-305m)	100ft (30.3m)
1001-4000ft (306-1219m)	2500ft (762m)
4001-10000ft (1220-3048m)	5500ft (1676m)
10001-20000ft (3049-6096m)	10500ft (1.99 miles/3.2km)
20001-30000ft (6097-9144m)	16500ft (3.13 miles/5.03km)
30001-40000ft (9145-12192m)	22000ft (4.16 miles/6.7km)
40001-50000ft (12193-15240m)	28000ft (5.3 miles/8.5km)
50000+ft (15241+m)	33500ft (6.3 miles/10.2km)

Cluster

Cluster warheads work by dispersing numerous submunitions. Each submunition is a small grenade-like bomb. These bombs impact all over the target area cratering it, thus causing widespread damage. Historically, one of the more useful applications of these bombs was for disabling runways. The cluster munitions impact all over the runway, rendering it unusable. The runway must then be repaired before it is possible to use it again. Cluster

bombs have become somewhat less useful, though, with the increasingly widespread use of VTOL aircraft.

Warhead	Damage	Maximum Range	Blast Radius	M.D.	Price
Anti-Runway (Light)	1D6x10 *	1/2 mile (0.8km) *	5 ft (1.5 m)	10	15,000
Anti-Runway (Medium)	1D6x10 *	1/2 mile (0.8km) *	5 ft (1.5 m)	15	25,000
Anti-Runway (Heavy)	1D6x10 *	1/2 mile (0.8km) *	5 ft (1.5 m)	25	42,000
Anti-Runway (X-Heavy)	1D6x10 *	1/2 mile (0.8km) *	5 ft (1.5 m)	35	55,000

* This weapon works by distributing (100 for Light bombs, 200 for Medium Bombs, 400 for heavy bombs, and 800 for X-Heavy Bombs) grenade type bombs to the target area. Each bomb does 1D6x10 MD to a 5 ft radius. The bombs are dispersed evenly within a 25ft radius for Light bombs , a 35ft radius for Medium bombs, a 50ft radius for heavy bombs, and a 70ft radius for X-Heavy bombs.

Anti-Runway versions of the bombs are work slightly differently. All of the bombs are dispersed along a path down the runway, thus rendering is unusable. Light bombs create a path 20ft wide by 75 ft long, Medium bombs create a path 30ft wide by 100 feet long, Heavy bombs create a path 40ft wide by 130ft long, and X-Heavy bombs create a path 60ft wide by 200ft long.

Deployable Minefield

Deployable minefield bombs are used to deliver mines in front of, behind, or even on top of enemy troops. Minefields will usually severely slow down advancing troops as they attempt to either clear or bypass the field. This time can be used by friendly troops to regroup, attack, or any of a number of things.

Warhead	Damage	Maximum Range	Blast Radius	M.D.	Price
Anti-Personnel Minefield (Light)	7D6**	1/2 mile (0.8km) *	20ft (6.1m)	10	17,000
Anti-Personnel Minefield (Medium)	7D6**	1/2 mile (0.8km) *	20ft (6.1m)	15	25,000
Anti-Personnel Minefield (Heavy)	7D6**	1/2 mile (0.8km) *	20ft (6.1m)	25	45,000
Anti-Personnel Minefield (X-Heavy)	7D6**	1/2 mile (0.8km) *	20ft (6.1m)	35	60,000

* Light bombs deliver 50 mines covering a 150ft by 150ft (45.7 m by 45.7 m) area, Medium bombs deliver 100 mines covering a 200ft by 200ft (61 m by 61 m) area, Heavy bombs deliver 200 mines covering a 265ft by 265ft (81m by 81m) area, and X-Heavy bombs deliver 400 mines covering a 350ft by 350ft (107m by 107m) area. The delivery pattern ensures that the entire area is covered with all areas within the trigger radius of at least one mine.

** Anti-personnel mines will be triggered by pressure of over 100 lb (45kg) within 15ft (4.6m).					
Warhead	**Damage**	**Maximum Range**	**Blast Radius**	**M.D.**	**Price**
Anti-Vehicle Minefield (Light)	1D4x10***	1/2 mile (0.8km) *	20ft (6.1m)	10	18,000
Anti-Vehicle Minefield (Medium)	1D4x10***	1/2 mile (0.8km) *	20ft (6.1m)	15	26,000
Anti-Vehicle Minefield (Heavy)	1D4x10***	1/2 mile (0.8km) *	20ft (6.1m)	25	47,000
Anti-Vehicle Minefield (X-Heavy)	1D4x10***	1/2 mile (0.8km) *	20ft (6.1m)	35	62,000
*** Anti-vehicle mines will be triggered by pressure of over 400lb (180kg) within 15ft (4.6m)					

Fuel Air Explosive

Fuel-Air Explosives (FAEs) are designed to cause massive damage by misting, then igniting a cargo of fuel. This detonation causes an incredible concussive effect. FAEs are much more effective against infantry or very lightly armored targets than against hard targets. One of the more useful aspects of the FAE is that the concussive effect is equal over virtually the entire blast radius. One unusual use for FAEs deals with minefields. The concussive pressure from the explosion will often either detonate pressure-sensitive mines or clear the dirt and earth off of them, making locating and disposing of them much easier.

Warhead	**Damage**	**Maximum Range**	**Blast Radius**	**M.D.**	**Price**
Fuel-Air Explosive (Light)	4D4x10*	1/2 mile (0.8km) *	100ft (30.3m)	10	14,000
Fuel-Air Explosive (Medium)	4D4x10*	1/2 mile (0.8km) *	120ft (36.4m)	15	20,000
Fuel-Air Explosive (Heavy)	4D4x10*	1/2 mile (0.8km) *	150ft (45.5m)	25	38,000
Fuel-Air Explosive (X-Heavy)	4D4x10*	1/2 mile (0.8km) *	250 ft (75.8m)	35	50,000
* Full damage is inflicted to all targets under 150 MDC. Targets possessing more MDC only take half damage.					
** Targets within the blast radius are likely (01-88%) to be knocked off their feet and stunned (01-65%). Targets knocked down will lose one melee action and initiative. Stunned targets are -10 to strike/parry/dodge/roll are the last to attack (no initiative) and lose half their attacks per melee for 1D4 rounds.					

Thermonuclear Weapons

Smart Missiles

All thermonuclear missiles are **smart missiles**. These smart missiles have advanced tracking and avoidance systems that give them a +5 to strike, +4 to dodge, and 2 attacks per melee until they strike their target or run out of fuel. Missiles will run out of fuel after 1 minute of engaging the target. In other words, the missile has 4 melees or 8 attacks to strike the target. It should also be noted that nuclear weapons are used almost exclusively against fixed targets, if ever used at all. Remember that missiles do NOT benefit from the strike bonuses of the pilot. See the Weapon Guidance article for more information.

Smart Bombs

Almost all of the bombs are considered to be **smart bombs**. These smart bombs have steering fins and a small rocket motor in addition to advanced targeting systems. With the rocket motor, they are even able to pursue a moving target. However, they are limited to a range of an extra half a mile (0.8km) in addition to the normal drop altitude range. These bombs will automatically hit a large stationary target like a building or bridge or blanket a specific area. They have a +6 to strike a moving target. Volleys can all strike the same target or they can each veer away to hit a different target. Remember that bombs do NOT benefit from the strike bonuses of the pilot. See the Weapon Guidance article for more information.

Price

Since thermonuclear weapons are so rare and restricted, prices are not listed. In most cases, no one outside of a legitimate government or organization will have any kind of possible access to one of these. If a thermonuclear weapon were to find its way to the black market, however, the asking price would at the minimum be in the millions, quite possibly much more.

Free-Fall Bomb Ranges

The horizontal range of a free-fall bomb depends upon the altitude from which it was dropped. The higher the altitude, the longer the possible horizontal travel of the bomb.

Drop Altitude	Maximum Horizontal Range
0-1000ft (0-305m)	100ft (30.3m)
1001-4000ft (306-1219m)	2500ft (762m)
4001-10 000ft (1220-3048m)	5500ft (1676m)
10 001-20 000ft (3049-6096m)	10 500ft (1.99 miles/3.2km)
20 001-30 000ft (6097-9144m)	16 500ft (3.13 miles/5.03km)

30 001-40 000ft (9145-12192m)	22 000ft (4.16 miles/6.7km)
40 001-50 000ft (12193-15240m)	28 000ft (5.3 miles/8.5km)
50 000+ft (15241+m)	33 500ft (6.3 miles/10.2km)

Thermonuclear Weapons

These are true thermonuclear weapons, among the most destructive forces man has ever created. Thermonuclear weapons are the most powerful weapons present on Rifts® Earth. Nuclear weapons are extremely rare; only the most advanced nations and city-states will possess these. Thermonuclear weapons are illegal in **all** Palladium® settings, from the 20th century games to Robotech® to Rifts®. Punishment for unauthorized possession is in the least hard jail time, possibly execution. Actual **use** of thermonuclear weapons is a capital offense even in areas that oppose the death penalty!

Special Rules

Thermonuclear weapons use several special rules:

- Anything within the Total Destruction Radius (TDR) is **gone**. Not hurt, not damaged, but totally destroyed. Nothing useful will survive the explosion. All living beings will be instantly killed; all buildings, robots, PA, vehicles, etc will most likely be obliterated outright. If not, they are wrecked beyond **any** possible use.
- Damage is applied differently at different ranges. Apply full listed damage from the TDR to the normal Blast Radius (BR). One-tenth damage is applied out to 1.5xBR. One-hundredth damage is applied out to 1.75xBR. One-thousandth damage is applied out to 1.875xBR. Damage beyond this is generally SDC damage.
- All thermonuclear missiles are treated as Cruise Missiles in terms of carrying capacity; thermonuclear bombs use the same payload table as conventional bombs.
- All thermonuclear weapons are considered to be either smart bombs or smart missiles.
- Refer to Gary Gore's article on nuclear weapons for information on additional and more in-depth effects such as radiation, fallout, and EMP.

Warhead	Damage	Speed	Max Range	Total Destruction Radius	Blast Radius	M.D.C.
Nuclear Missile (light) *	1D6x1000	2500mph (4023kmph)	1400 miles (2249km)	1.4 miles (2.2 km)	2.1 miles (3.4 km)	25
Nuclear Missile (Medium) *	2D4x1000	2500mph (4023kmph)	1400 miles (2249km)	2.9 miles (4.7 km)	4.6 miles (7.3 km)	25

Nuclear Missile (heavy) *	2D6x1000	2500mph (4023kmph)	1000 miles (1608km)	4.7 miles (7.5 km)	7.3 miles (11.6 km)	25
Nuclear Missile (x-heavy) *	4D4x1000	2010mph (3228kmph)	1000 miles (1608km)	6.3 miles (10.1 km)	9.8 miles (15.7 km)	25
Nuclear Bomb (x-light) *	1D6x1000		1/2 mile (0.8km) *	1.4 miles (2.2 km)	2.1 miles (3.4 km)	25
Nuclear Bomb (light) *	2D4x1000		1/2 mile (0.8km) *	2.9 miles (4.7 km)	4.6 miles (7.3 km)	35
Nuclear Bomb (medium) *	2D6x1000		1/2 mile (0.8km) *	4.7 miles (7.5 km)	7.3 miles (11.6 km)	55
Nuclear Bomb (heavy) *	4D4x1000		1/2 mile (0.8km) *	6.3 miles (10.1 km)	9.8 miles (15.7 km)	65
Nuclear Bomb (x-heavy) *	3D6x1000		1/2 mile (0.8km) *	8 miles (12.7 km)	12.5 miles (19.9 km)	80
** Missiles and Bombs are all considered to be **Smart Missiles** and **Smart Bombs** (see above).*						

Note: When a description says it can carry **X** number of bombs, it can carry that many heavy bombs. Other bomb sizes can be carried in varying amounts:

- Light: Two light bombs may be carried per every space.
- Medium: Three medium bombs may be carried per every two spaces.
- Heavy: One heavy bomb may be carried per space.
- X-heavy: Two x-heavy bombs may be carried per every three spaces.

Back to Revised and Expanded Missile & Bomb Tables.

Additional information obtained from the article Nuclear Weapons by Gary Gore.

By Chris Curtis (curtis@thepentagon.com).
With help from Mad Dog (maddog1@Alaska.NET) and
Kitsune (Kitsune@vabch.com).

Weapon Guidance Systems

Note: This document is designed to provide rules for dealing with various types of weapon guidances. These are optional rules and are only intended to be used if both the GM and players wish to introduce the element of weapon guidance into their game.

Types of Missiles and Common Guidance

Mini Missiles:

Palladium books states that mini missiles do not have guidance, in effect making them ordinary rockets. While mini-missiles can be completely unguided, most mini missiles use some form of direct control to aim the missiles. These guidance systems include Command, Semi Active Laser Homing, Semi Active Radar Homing, and Guide by Wire. The most common guidance system for mini missiles is Semi Active Laser Homing.

Short Range Missiles:

These Missiles can use all the mini missile guidance systems and in fact Semi Active Laser Homing is fairly common. Short Range missiles can also carry Active Radar Homing, Anti Radiation Missiles, Infrared Homing, and Optic Guidance. The most common form of guidance system is Active Radar Homing because of its flexibility.

Medium Range Missiles:

Medium Range Missiles have more room for guidance systems than Short Range Missiles do. This allows them to carry up to one additional guidance system beyond the original. This can include any of the normal systems or the smart missile package. All medium range missiles have some form of inertial navigation system so that the missile can reach the general location of the target.

Long Range Missiles:

Long Range Missiles have even more space for guidance systems than medium range missiles do. This allows them to carry up to two additional guidance systems beyond the original. This can include any of the normal systems or the smart missile package. All long range missiles have some form of inertial navigation system so that missile can reach the general location of the target.

Cruise Missile:

Cruise Missiles are the largest missiles used practically in Rifts. Because of

their size, they can carry up to three additional guidance systems beyond the original. This can include any of the normal systems or the smart missile package. All cruise missiles have some form of inertial navigation system so that missile can reach the general location of the target.

Weapon Type	Guidance	Cost in Credits (No Guidance)
Mini Missiles	One non-autonomous system	See conventional missile table.
Short Range Missiles	Any one guidance system	See conventional missile table.
Medium Range Missiles	One standard plus up to one additional	See conventional missile table.
Long Range Missiles	One standard plus up to two additional	See conventional missile table.
Cruise Missile	One standard plus up to three additional	See conventional missile table.
Light Bombs	One non-autonomous system	See convention bomb table.
Medium Bombs	Any one guidance system	See convention bomb table.
Heavy Bombs	One standard plus up to one additional	See convention bomb table.
X-Heavy Bombs	One standard plus up to two additional	See convention bomb table.

Guidance Systems

There are a wide variety of different guidance systems available for weapon systems. Most weapons can use almost any of the systems listed, however, some weapons are limited in the types of guidance that they can use. The following abbreviations will be used to identify the different weapon types.

Weapon Type	Abbreviation
Mini Missile	MM
Short Range Missile	SRM
Medium Range Missile	MRM
Long Range Missile	LRM
Cruise Missile	CM
Light Bomb	LB
Medium Bomb	MB
Heavy Bomb	HB
X-Heavy Bomb	XB

Active Radar Homing (ARH):

This guidance is a tiny radar system that allows the weapon to guide itself to target. This guidance is *autonomous*. The guidance system can be detected by any system that detects radar signals. These weapons can easily be directed towards multiple targets if the launch system allows multiple targeting at the same time. These weapons are vulnerable to being tricked by chaff systems, can be jammed by active jamming systems, and have minuses to targets that are radar stealth vehicles. Many ARH weapons have a home on jam function which means that when jammed, the weapon will head for the jamming signal and target that.

The guidance has +3 to strike.

Availability: SRM, MRM, LRM, CM, MB, HB, XB

Anti-Radiation (AR):

This guidance has a special system that tracks on Electromagnetic signals. This is normally used to track on radar transmitters but can be used to home in on radio, microwave, and other similar signals as well. This guidance is *autonomous*. These weapons can easily be directed towards multiple targets if the launch system allows multiple targeting at the same time. These guidance systems are a special purpose system and will only target active transmitters and as such the best defense is to shut the transmitter off. Most AR systems remember the last location of the target and will target that location.

The guidance has +4 to strike a target that has active emissions but cannot hit targets that are not active (ARs that remember target will have no bonuses to strike).

Availability: SRM, MRM, LRM, CM, MB, HB, XB

Command (CMD):

The weapon is controlled by a radio signal the gives the weapon directions to hit its target. This guidance is *non-autonomous* but launching system could be. Weapons can be guided to different targets by using either separate radio channels or by codes designating the specific weapon that is being directed. This means that when using this system to hit different targets at the same time at short ranges, only two or three separate targets can be targeted. This system is limited to the range of the radio signals although directors could pass to other directing signals. This system is vulnerable to radio jamming and if jammed, the weapon will either detonate or will follow a pre-programed course.

This guidance uses the bonuses of the director of the weapon (in the case of a gunner, their bonuses) to strike. If jammed, weapons are at -9 to strike with no gunner bonuses to strike.

Availability: MM, SRM, MRM, LRM, CM, LB, MB, HB, XB (All)

Guide by Wire (WIRE):

This system is only used by missiles. The missile is controlled by signals through a wire to the missile guidance system. The range of missiles with this guidance system is normally limited to about 5 miles due to the length of the wire. This missile guidance is *non-autonomous* but launching system could be (although highly doubtful). In order for the missile to target more than one target at the same time, each missile needs to be directed by a different controller. This missile's only weaknesses is that there is a chance the wire can be cut. (If the missile travels more than 2 miles, there is a 15% chance of the wire breaking because of tension or catching on an object and an additional 10% for every mile beyond two.)

The missile guidance use the bonuses of the director of the missile (in the case of a gunner, their bonuses) to strike. If the wire is cut, the missile loses all guidance (no strike bonuses) and is -9 to strike.

Availability: MM, SRM, MRM, LRM, CM

Infrared Homing (IRH):

This guidance detects the infrared or heat radiation given off by a target. This weapon guidance is *autonomous*. These weapons can easily be directed towards multiple targets if the launch system allows multiple targeting at the same time. These weapons can be tricked by flares and strong heat sources.

The guidance has +4 to strike aircraft from the rear (in the case of missiles) and +2 to strike the fronts and sides of a jet, or other targets that emit large amounts of heat.

Availability: SRM, MRM, LRM, CM, MB, HB, XB

Optical Guidance (OPT):

This guidance uses an optical system to visually lock on to the target. This weapon guidance is *autonomous*. These weapons can easily be directed towards multiple targets if the launch system allows multiple targeting at the same time. These weapons need to be directed to the location of their target because they only have the ability to see targets at a limited distance and have a relatively small arc of search. These weapons can be tricked by changing the targets profile, by target changing position, and by very thick smoke, although weapons with thermal imaging can see through the smoke.

The guidance has +3 to strike.

Availability: SRM, MRM, LRM, CM, MB, HB, XB

Semi Active Laser Homing (SALH):

This guidance system homes on the reflected light from a laser designator. This systems is very hard to fool and is very accurate. The only weaknesses is that the target must be within the line of sight of the director (no over the horizon targeting) and some targets with high tech sensors are capable of detecting when they are being targeted. Only the target or sensors within about 6 inches of the beam can pick up the laser beam.

The guidance use the bonuses of the director of the weapon (in the case of a gunner, their bonuses) to strike.

Availability: MM, SRM, MRM, LRM, CM, LB, MB, HB, XB (All)

Semi Active Radar Homing (SARH):

This guidance system follows a radar beam from a director to a target. This systems is similar to the SALH but uses a radar beam in place of a laser beam. The weaknesses of this system is that it can be fooled by chaff, can be jammed by radar jamming, has minuses to targets that have radar stealth, most sensors will pick up the radar beam, and target must be in a direct line with the director (no over the horizon targeting).

The guidance use the bonuses of the director of the weapon (in the case of a gunner, their bonuses) to strike.

Availability: MM, SRM, MRM, LRM, CM, LB, MB, HB, XB (All)

Smart Guidance (SMRT):

Smart guidance works differently for missiles and bombs.

Smart Missiles are able to dodge attacks directed toward it and the missile can return and strike target again. Smart missiles must have another autonomous guidance system installed. Smart missiles also separate when launched so they cannot be destroyed as a volley. All smart missiles automatically have the special features of IFF identification and Loiter capability (see below). This feature can only be added to medium range or larger missiles (except in very special cases).

These smart missiles have advanced tracking and avoidance systems that give them a +5 to strike, +4 to dodge, and 2 attacks per melee until they strike their target or run out of fuel.

Smart Bombs have steering fins and a small rocket motor in addition to advanced targeting systems. With the rocket motor, they are even able to pursue a moving target. However, they are limited to a range of an extra one-half mile (0.8km) in addition to the normal drop altitude range. Volleys can all strike the same target or they can each veer away to hit a different target. Smart bombs must have another autonomous guidance system installed, but automatically have the special feature of IFF identification (see below).

These bombs will automatically hit a large stationary target like a building or bridge or blanket a specific area. They have a +6 to strike a moving target.

Availability: Special. See conventional missile or bomb tables.

Guidance System:	Cost of Guidance	Special	Cost (Special)
Active Radar Homing (ARH)	500 Credits	Home on Jam	250 Credits
Anti Radiation (AR)	800 Credits	Remembers Location	200 Credits
Command (CMD)	200 Credits		
Guide via Wire (WIRE)	200 Credits		
Infra Red Homing (IRH)	400 Credits		
Optic Guidance	500 Credits	Thermal Imaging	250 Credits
Semi Active Laser Homing (SALH)	200 Credits		
Semi Active Radar Homing (SARH)	200 Credits		
Smart Missile Guidance (SMRT-M)	40,000 Credits	IFF and Loiter	
Smart Bomb Guidance (SMRT-B)	30,000 Credits	IFF	

Special Features

Several different "special" features are available for missiles in addition to the various types of guidance. These systems are in addition to any guidance and do not take up the space of a guidance system.

IFF Identification:

This is a relatively inexpensive feature. This feature allows a weapon to read the IFF (Identify Friend/Foe) signature of the target (if it has one, many alien vehicles do not) and either include or not include it as a valid target. This could mean that the weapon will only strike a target that is radiating a specific IFF or only strike targets that do not radiate a specific IFF. A maximum of 200 different IFF signatures can be stored. In reality, warring parties very often change their IFF frequencies during a conflict. Therefore, this system is usually programed soon before the craft leaves the base. It is possible to re-program the guidance from the craft itself if the vehicle has more than just one pilot or has a very advanced computer system (artificial intelligence).

Loiter Capability:

This feature is only available for missiles. This is also a relatively inexpensive feature. This allows the missile to wait until a target comes back into view. This feature is especially useful for Anti Radiation missiles. The missile will loiter until it runs out of fuel (usually about one minute or 4 melees).

Surface Skimming:

This feature is only available for missiles. It allows the missile to skim just over the surface of ground or water. This feature includes both physical additions and programming changes and the missile must use a smaller engine. It does not affect what types of guidance or special features a missile can have. A Surface skimming missile costs a little bit more than a normal missile and has 25% less speed. A missile can be both a normal flight path missile and can be a Surface skimming but costs more and both range and speed are reduced by 25%.

Special Feature	Cost	Notes
IFF Identification	1000 Credits	Can store up to 200 IFF codes
Loiter Capability	2000 Credits	Will wait for target to reappear
Surface Skimming	+20% to Cost	Missile is 25% slower than normal
Surface Skimming and Normal Flight	+50% to Cost	Missile is 25% slower and has 25% less range

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Back to Revised and Expanded Missile & Bomb Tables.

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Nuclear Weapons

"The splitting of the atom has changed everything save our mode of thinking and thus we drift toward unparalleled catastrophe"
- Albert Einstein

A Nuclear Explosion

When a nuclear weapon explodes, in about a millionth of a second a temperature of up to eighteen million degrees Fahrenheit, comparable to that inside the sun, is produced. About half of this is immediately lost in the close vicinity of the explosion as a luminous white fireball appears, expands and begins to rise.

For up to a minute, energy in the forms of radiation, EMP (electromagnetic pulse), light, heat, sound, and blast is released in all directions. The fireball then ceases to be luminous and begins to cool as its cloud rises many thousands of meters at up to 480 kilometers per hour. As the cloud billows out into its eventual mushroom shape it sucks up after it a column of dust from the earth's surface. This dust mixes with residue of the weapon and becomes radioactive fallout.

Components of the Nuclear Explosion

Light
This is largely ultraviolet and infrared, more intense than it appears to be, and liable to cause blindness, even though sight may return within a few days.

Heat
One third of the energy of a nuclear weapon is emitted in this form. It radiates in straight lines at the velocity of light, but has little penetrating power and is weakened by haze or mist. Its range, however, is greater than that of blast or of initial radiation, and it may cause injury or death to those exposed and damage to property by starting fires.

Blast
A wave of compressed air moves away from the site of a nuclear explosion at about the speed of sound. Lasting several seconds, it maintains pressure upon objects in its path in a manner more usually associated with a very high wind than the shock wave of an explosion. It is the main cause of damage to buildings, and a hazard to those outside or within. A wave of air rushes back in to fill the void seconds after the initial blast wave passes. This wave is not as strong, maybe several hundred kilometers per hour.

Side Affects of the Nuclear Explosion

Radiation
The electromagnetic spectrum consists of cosmic rays, gamma rays, x-rays, ultraviolet rays, visible light rays, infrared rays, and radio rays. Of these, gamma rays are of chief concern to us. Gamma rays, alpha and beta particles, and neutrons result from decay of radioactive substances, and all four are emitted following a nuclear explosion. Their effects are all referred to below as radiation.

When ionizing radiation enters the body, some of it is absorbed. This ionizes molecules in some of the body's cells, producing chemical changes so they cease to function. What is called "radiation sickness" may then occur.

Fallout
With surface explosions, or at altitudes low enough for the fireball to touch the ground, huge quantities of

earth and debris, together with the fission products, are sucked into the fireball. As the fireball cools, the radioactivity condenses on the particles that were lifted from the ground; many of these are large particles and they come down by the force of gravity within a day, or, at distances not too far from the burst, some hundreds of kilometers. This constitutes the "local" or "early" fallout. The extent and location of the early fallout depends primarily on the meteorological conditions, e.g. the velocity and direction of the wind. They also depend on precipitation conditions; the particles may come down to earth with the rain or snow, which is referred to as "rainout" or "snowout".

In addition to surface bursts and air bursts, underwater bursts occur at times. Radioactive fission products would mainly be absorbed by the water. However, some would escape to produce radioactive materials carried in a cloud of fog/spray which could drift in over land, adding to the exposure.

It should be noted that all nuclear weapons detonated in the air give rise to fallout, but where and when it occurs depends primarily on the altitude of the explosion. With explosions in the air at altitudes such that the fireball does not touch the ground, the fission products, which are initially in gaseous form, rise with the fireball to great heights into the troposphere or stratosphere. When the temperature of the fireball becomes sufficiently low, the radioactive materials form particles, through condensation and coagulation. These particles are very small, and as a result their descent is very slow; it may take many months before they come down to the ground.

EMP (Electro-magnetic Pulse)
This is a byproduct of the immediate energy release from a detonated nuclear device which, as well as the other effects mentioned above, also has the effect of altering the electrical properties of electrons in the nearby atmosphere. This can produce intense electrical and magnetic fields that can extend for considerable distances from the point of detonation. The resultant electrical current eddies which pass through these disturbed electrical fields give rise to the EMPs that can, by themselves, produce so much energy that they can severely affect electronic-based equipment and electrical and radar transmissions to the point of destroying equipment circuits, components and communications. The effects of EMP diminish sharply with distance from the point of detonation but can still cause damage at ranges greater than those for the other 3 major effects (under certain circumstances). Their main significance will be to communications; the communications networks will probably be rendered inoperative for considerable periods of time by interference from EMPs, and the results of such breakdowns can well be imagined. At the very moment when radio and other links (including land lines) between various command levels are at their most important the EMPs will render them virtually useless over large areas. Even when a nuclear explosion has passed, the reverberations produced by the EMP in the atmosphere may well linger to cause continued interruptions. Heavy concentrations of fallout will produce radiation to create further interference across radio and other communication frequencies.

Mass Fires
There are two types of mass fires - the conflagration and the firestorm. Both are created from the hundreds of individual fires that are started as a result of the nuclear blast.

> **Conflagration Fire**
> The conflagration is a large-area fire which is moved by a strong wind, devouring everything in its path. The wind causes a literal wall of flame to form and to move before it. This type of mass fire can be expected to occur in many forests and in dry grassy areas. If you consider the damage done over the last few years by brush and forest fires in California, you can begin to understand the destruction that would be caused by hundreds of such fires massing together.
>
> **Firestorm**
> The firestorm is a mass fire that burns intensely in one area. As the many smaller fires burn, they cause air to be pulled into the area, and smoke and superhot gases then escape upward. Once this airflow pattern begins, it feeds on itself, creating a sort of a chimney effect. Once the phenomenon is fully developed the air flows into the area at between 80 and 115 kilometers

per hour. Temperatures reach as high as 1000 to 2000 degrees Fahrenheit, so even things that aren't actually touched by flames are consumed and destroyed. Unlike the conflagration, a firestorm doesn't travel; it moves little, if at all, due the strong winds blowing in from all sides.

A firestorm can form in an area of many smaller fires in about 15 to 20 minuets and may last anywhere from 3 to 8 hours. Many parts of the area may remain too hot to enter for a couple of days after the fires have burned themselves out.

Nuclear Weapon Explosion Data (Surface Burst)

Yield	Crater Dia	[1] Fireball Dia.	[2] Total Destruction Radius	[3] Heavy Damage Radius	[4] Moderate Damage Radius	[5] Light Damage Radius
5 Kt	0.068	0.084	0.469	0.678	1.042	1.303
10 Kt	0.085	0.111	0.591	0.919	1.313	1.642
20 Kt	0.108	0.146	0.745	1.158	1.655	2.608
50 Kt	0.146	0.211	1.011	1.572	2.246	2.807
100 Kt	0.184	0.278	1.273	1.981	2.830	3.537
200 Kt	0.232	0.368	1.604	2.495	3.565	4.456
300 Kt	0.265	0.433	1.836	2.857	4.081	5.101
500 Kt	0.315	0.531	2.177	3.387	4.838	6.048
1 Mt	0.396	0.700	2.743	4.267	6.096	7.620
2 Mt	0.499	0.924	3.456	5.376	7.680	9.601
3 Mt	0.572	1.087	3.956	6.154	8.792	10.980
4 Mt	0.629	1.219	4.355	6.774	9.677	12.096
5 Mt	0.678	1.333	4.691	7.297	10.424	13.030
8 Mt	0.792	1.609	5.486	8.534	12.192	15.240
10 Mt	0.854	1.759	5.910	9.193	13.133	16.417
20 Mt	1.076	2.322	7.466	11.583	16.547	20.684
25 Mt	1.159	2.538	8.021	12.477	17.825	22.281
30 Mt	1.231	2.730	8.524	13.259	18.942	23.677
40 Mt	1.355	3.063	9.382	14.594	20.848	26.060
50 Mt	1.460	3.349	10.106	15.720	22.458	28.072
100 Mt	1.839	4.420	12.733	19.807	28.295	35.369
150 Mt	2.105	5.198	14.575	22.673	32.390	40.487

Kt = kiloton (1 Kt = 1000 tons = 2 million lb.)
Mt = megaton (1 Mt = 1000 kilotons = 2 billion lb.)
Note: All measurements are in kilometers.

Damage Radius Modification Factors for Various Bursts Heights

	Crater Dia	[1] Fireball Dia	[2] Total Destruction Radius	[3] Heavy Damage Radius	[4] Moderate Damage Radius	[5] Light Damage Radius
Subsurface Explosion (-100 meters)	x0.80		x0.80	x0.80	x0.80	x0.80
Extra Low Air burst (600 meters)		x3.00	x3.00	x3.00	x3.00	x3.00
Low Air burst (2.5 kilometers)		x3.50	x3.50	x3.50	x3.50	x3.50
Medium Air burst (5.3 kilometers)			x4.00	x4.00	x4.00	x4.00
High Air burst (10 kilometers)			x4.50	x4.50	x4.50	x4.50
Extra High Air Burst (25 - 30 kilometers)			x0.75	x1.00	x3.00	x6.00
Outer Atmosphere Burst (Above 30 kilometers). No significant damage done, EMP is the most destructive effect of this type of detonation.						

Crater Depths
Crater formation will occur when the height of the burst is less than 1/10th of the maximum radius of the fireball.

Surface Explosions and Low Air bursts	
1 Mt	36.576 meters
10 Mt	60.960 meters
100 Mt	100.584 meters

Subsurface Explosions	
1 Mt	88.392 meters
10 Mt	131.064 meters
100 Mt	192.024 meters

All values can be extrapolated for values in between.

Radius M.D. Factors for Ground and Aerial Targets
The following damage factors take Heat and Blast effect in account.

Note: A nuclear Detonation goes out in all directions - up as well as along the ground.

Surface and Air Burst
TDR - Totally Destroyed
HDR - 3d6*1,000 M.D.
MDR - 2d6*100 M.D.
LDR - Only S.D.C. Inflicted

Note: For aerial targets roll the following percentage additions against the particular skill used to fly the aerial vehicle only if the vehicle survives the initial blast wave. Roll again for the second return blast wave with the same modifications.

HDR: -90%

MDR: -70%
LDR: -40%

If the roll fails, the pilot loses control of the aircraft/mecha, which results in the aircraft tumbling out of the sky and should be role-played to it's fullest.

Sub-Surface Explosion
TDR - Totally Destroyed
HDR - 4d6*1,000 M.D. to structures on/under the ground only
MDR - 3d6*100 M.D. to structures on/under the ground only
LDR - Only S.D.C. Inflicted to structures on/under the ground only

Breakdown of the Blast Zones

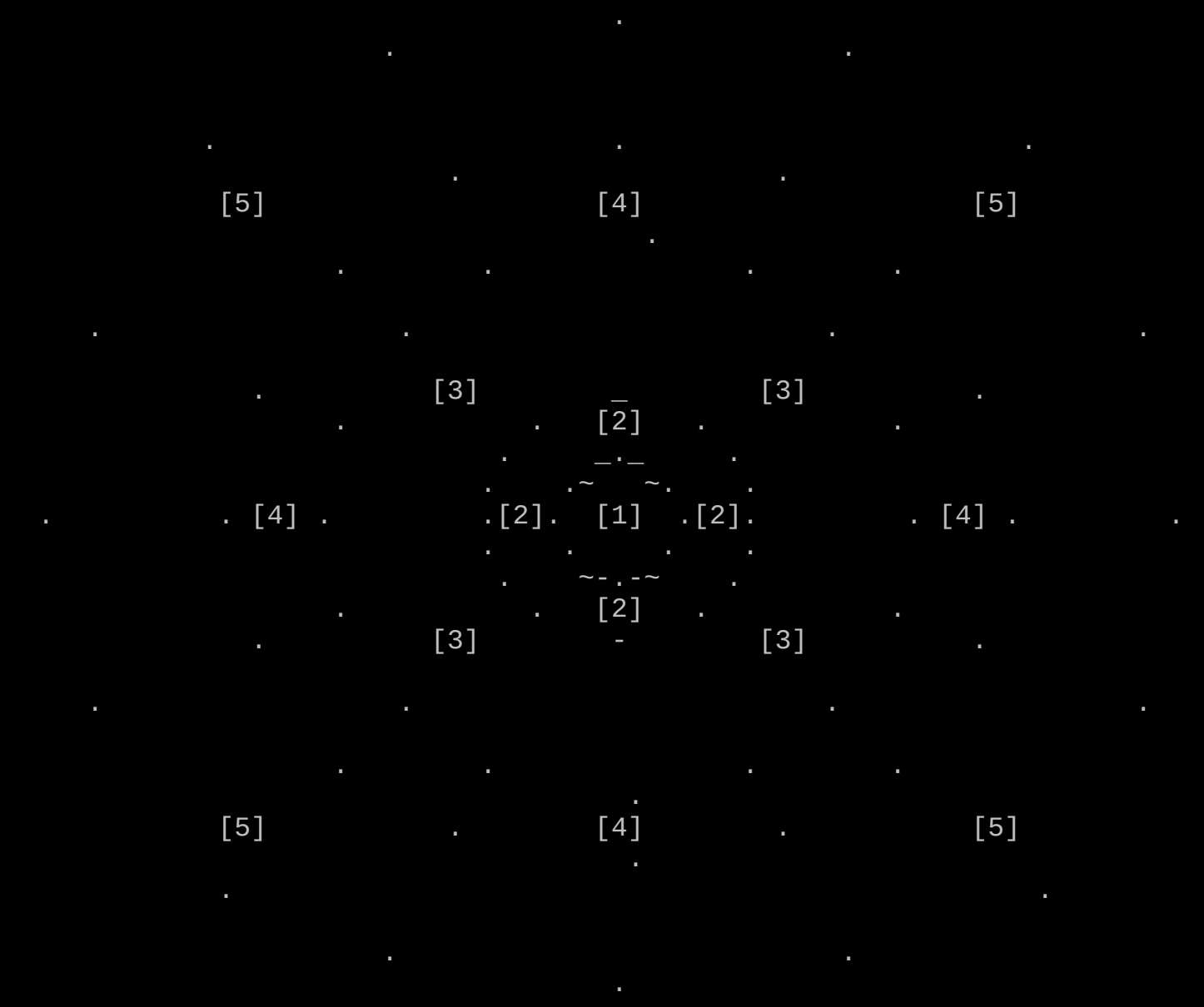

Diagram Outline

[1]	Vaporization Point (Crater)	Everything is vaporized by the blast.
[2]	Total Destruction	All structures above ground are destroyed.

[3]	Severe Blast Damage	Factories and other large-scale buildings collapse. Severe damage to highway bridges. Rivers sometimes flow counter-current.
[4]	Severe Heat Damage	Everything flammable burns. People in the area suffocate due to the fact that most available oxygen is consumed by the fires.
[5]	Severe Fire & Wind Damage	Residency structures are severely damaged. People are blown around. 2nd and 3rd-degree burns suffered by most survivors.

Radiation Damage

Radiation damage is permanent and any further exposure is cumulative and is added to the character's total. The following list is the classes of radiation exposure a character is placed in according to their cumulative total. The classes are to be used to determine which character should allow themselves to be exposed to radiation if they are given the choice.

New stat added for game play: Radiation Exposure Class (RC). All starting characters start out with RC-0.

Exposure Classes

Class	**Exposure** (in RADS)	**Risk**
RC-0	0 Exposure	May take normal risks
RC-1	0< RADS <=70	Should avoid further exposure
RC-2	70< RADS <=150	Should not risk any further exposure
RC-3	150 +	Only in absolute emergency should any further exposure be risked

Whole Body Radiation Damage from Craters and Fallout
The following table lists the effects of different whole body radiation dosages on humans. The damage resulting from radiation is listed with the convalescent period being the time required to recover from the damage.

Note: Though the damage resulting from radiation can be healed the radiation absorbed is permanent and cannot be "healed"

Dosage in RADS	**Incidence of Vomiting**	**Convalescent Period**	**Effects**
0-25	0%	N/A	Practically no "short-term" effects. May be some blood cell damage.
26-100	5%	7 Days	A small amount of nausea and sickness for highest dose level. Blood changes noticeable.

101-200	100%	Up to 40 Days	Definite identifiable changes in blood cells. Highest dose causes hair loss, livid skin spots, nausea, vomiting, diarrhea, fevers, hemorrhages and great fatigue. Heart failure in some.
201-400	100%	Several weeks	Symptoms as above but more to months, severe Fatal to 25% in low range, 50% in high range.
401-600	100%	Death	Symptoms as above but now very and occurring soon after exposure. Death will occur within 1d6 days.
601-800	100%	Death	Symptoms as above but circulatory system and parts of the central nervous system malfunction rapidly. Death will occur in 1d6 hours.
801-5000+	100%	Death	Outcome very rapid. Vomiting, falling blood count, diarrhea, great fatigue, internal bleeding, organ failure, nervous system collapse heart failure, coma, and then death.

These doses are immediate or one hour doses, these are strictly worse case possible results. The same dosage acquired over a longer time span would have significantly less drastic effects.

Gaming Penalization for Radiation Levels

RAD Level	**Penalty**
0-25	None
26-100	P.S. -1, P.P. -1, P.E. -1
101-200	P.S. -2, P.P. -2, P.E. -2, P.B. -2, P.P.E. -10
201-400	P.S. -3, P.P. -3, P.E. -3, P.B. -3, P.P.E. -20
401-600	P.S. -5, P.P. -5, P.E. -5, P.B. -5, P.P.E. -40
601-800	P.S. -7, P.P. -7, P.E. -7, P.B. -7, P.P.E. -50
801-5000+	P.S. -15, P.P. -15, P.E. -15, P.B. -15, P.P.E. -100
The above effects are permanent and cannot be modified by normal means.	

Radioactive Contamination Zones in Crater

The most radioactive area would be the bomb crater itself. This area is referred to as Zone 1, and the radioactive level of this zone varies according to the type of burst (see following table). The size of this is equal to the size of the bomb crater itself. Zone 2 is a secondary area of radiation surrounding the bomb crater. The radiation in this zone is only found in craters resulting from surface and subsurface bursts. The size of Zone 2 is equal to the diameter of the bombs fireball. The contamination levels will be very high for several decades after a ground/subsurface burst.

The residual radiation for Zones 1 and 2 are shown below.

	Subsurface Burst	**Surface Burst**	**Air Burst**	**High Air Burst**

Zone 1	8000 RADS/Hr	6000	4000	2000
Zone 2	4000 RADS/Hr	3000	N/A	N/A

Dose Rates

RADS/Hr	RADS/Melee
10000	42
9000	37
8000	33
7000	29
6000	25
5000	21
4000	17
3000	12.5
2000	8
1000	4
500	2
100	0.4
50	0.2
25	0.1

To find any value in between these just divide RADS/Hr by 240 (4 melees per minute x 60 minutes in one hour).

Fallout/Snowout
Fallout follows the t-1.2 law which states that for every sevenfold increase in time after detonation there is a tenfold drop in radiation output.

> **Example 1.** A reading of X level of radioactivity at Y hours after detonation would indicate a level of radioactivity of .1X at 7Y hours after detonation. This is accurate for 2500 hours (14 weeks) following the explosion, thereafter the dose rate is lower than t-1.2 would predict.
>
> **Example 2.** If a dose rate of 100 RADS/Hr was found at 1 hour after detonation (this assumes all significant fallout from the bomb has fallen, therefore starting with the seven hour point is probably more realistic) would be 10 RADS/Hr at 7 hours, 1 RAD/Hr at 48 hours (2 days), .1 RAD/Hr at 343 hours (2 weeks), .01 RAD/Hr at 2401 hours (14 weeks).

fallout blows downwind and will fall out at some distance from the explosion. following are examples of various nuclear levels after Y hours percentage population dead exposure to out.

Time	RADS/Hr	Death Percentage in population
An area 16 Km wide by 48 Km downwind from a single 1 MT ground burst		
1 Hr.	1,000	100% dead at 1 hour of exposure
7 Hours	100	50% dead within 7-8 hours of continuous exposure
2 Days	10	50% dead for 5 days of continuous exposure

2 Week	1	50% dead for 1 month continuous exposure
14 Weeks	0.1	0% dead from radiation hereafter
An area 19 Km by 152 Km downwind for a single 1 MT ground burst		
1 Hr.	0	Radiation has not arrived yet
7 Hrs.	50	50% dead for 18 hours of continuous exposure
2 Days	5	5% dead for 2 weeks of continuous exposure
2 Weeks	0.5	0% dead from radiation hereafter
14 Weeks	0.05	0% dead from radiation hereafter

The above examples indicate conditions and exposures that would only be acceptable in wartime. In the examples the wind is continuous in direction and velocity. A real wind would not make such nice neat patterns.

Examples of levels of fallout from a single 1 Mt ground burst with a 24 kph wind.

As a very general rule of thumb, you can expect fallout to move approximately 48 kph. The fallout from a medium-size bomb will extend for several 100's of with the heaviest concentrations within about 325 km of the blast. Areas farther downwind may not receive any fallout for several hours; those closer may get it within fifteen minutes.

The following table shows approximately how long it will take, under normal atmospheric conditions, for fallout to reach the ground at specified distances downwind from a 5 Mt burst.

Distance from Blast	**Fallout Will Begin After**
8 Km	20 Minutes
40 km	1 Hour
160 Km	3-5 Hours

Fallout usually drifts down over a period of time; it doesn't just plop down all at once. In areas receiving immediate fallout, the particles may continue to fall for a much as 24 hours. Outside the immediate burst area most of the fallout - about 80% of it - will come down within the first 48 hours. Any rain or snow will bring it down even faster and in greater concentrations. Many of the smaller particles may stay in the atmosphere for months or even years.

The following table lists estimated levels of radiation one hour after the detonation of a 20 Mt bomb.

Distance from Blast	**Radiation Level**
8-24 km	10000-1000
24-120 Km	1000-100
120-193 km	100-0

For all practical purposes, radiation levels in excess of a few thousand rads can be ignored. The areas that receive such heavy fallout also will be hit hard by the initial blast and heat.

The following table shows how a starting radiation level of 2000 rads will decay and the total accumulation one can expect as it does so. An area receiving this amount of fallout is likely to be relatively close to a blast site. Figures such as these are not exact. The actual dosages and rates of decay will be altered by local factors such as weather and terrain, but this table does provide a good example.

Time Interval	Interval Dose	Cumulative Dose
1st-2nd hour	2000	2000
2nd-3rd hour	1000	3000
3rd-4th hour	640	3640
4th-5th hour	440	4080
5th-10th hour	1200	5280
10th-24th hour	1200	6480
2nd day	760	7240
3rd day	400	7640
4th day	240	7880
5th day	180	8060
6th day	140	8200
7th day	96	8296
2nd week	430	8726
3rd week	230	8956
4th week	110	9066
2nd month	175	9241
3rd month	80	9321
4th month	50	9371
5th month	30	9401
6th month	20	9421
6th-12th month	50	9471
2nd year	16	9487
3rd year	5	9492
4th year	3	9495

Areas covered by a given accumulated doses from fallout

Upper Limit of Accumulated Dose	Area (Km^2)	
RADs	**1 Mt**	**10 Mt**
1000	900	11000
800	1200	14000
600	1700	18000
400	2600	27000
200	5500	52000
100	10500	89000
50	18600	148000

25	32700	234000
10	56000	414000

These figures are just rough estimations of the actual areas covered.

EMP (Electro-magnetic Pulse)
EMP damage goes out in all directions, to distances greater than that of the effects of the blast itself.

As a general rule of thumb, the distance an EMP will travel is directly related to the height of the burst, the strength of the blast and any natural features in its path.

Rough rule of thumb for the EMP distance covered.

(Height of burst in km x 1000) x (Megatonnage of bomb / 10) = radius of EMP in km

Example:

A 10 Mt bomb detonated at a height of 50 Km.

(50 x 500) x (10/10) = 25000 Km radius

Damage from Pulse
The damage inflicted from the pulse will be to electrical equipment only ie computers, radios, telephones, mecha, aircraft, power distribution networks and any other device not hardened from an EMP. The manifestation of this damage will be burnt out electronic components, circuits fried beyond repair etc.

Miscellaneous Notes on Nuclear Explosions

Visibility Distances
The tables shows the distances at which an exposed person would suffer second-degree burns, or at which exposed dark coloured clothing or paint would catch fire. It further shows how these distances are affected by varying visibilities. Distances are in kilometers.

Visibility (km)	**Size of bomb (Mt)**					
	1	**5**	**10**	**20**	**50**	**100**
16	10	18	21	24	26	28
48	11	22.5	26.5	29	35	42
80	14	27	33	42	52	61

The next table looks at the same effects from weapons detonated at an altitude to maximize blast effects.

Visibility (km)	**Size of bomb (Mt)**					
	1	**5**	**10**	**20**	**50**	**100**
19	14	29	40	51	76	98
4	10.5	22.5	29	39	61	80
1.9	4.5	10	13	19	26	30.5
0.96	0.5	3	4	6.5	11	18

19 km visibility is considered an average clear day.
4 km visibility is considered a medium-hazy day.
1.9 km visibility is considered a day of heavy cloudiness.
0.96 km visibility is considered a day of dense cloudiness.

Wind Speeds

The following table gives examples of wind speeds that could be expected at various distances from a 20 Mt explosion.

Distance (km)	**Surface Burst** (kph)	**Optimum Air Burst** (kph)
3.2	2333	3138
4.8	1046	2253
8	483	684
16	177	321
24	88.5	185
32	56	121
48	30.5	72.5
80	14.5	32

These figures are approximation, since variables such as terrain and obstructions affect the speeds. The winds will be highest in areas where the land is flat and smooth; hilly terrain or many large buildings will lower velocity. When I say that the winds will be lowered so much that they are no longer be any danger. Rather, the area of danger will simply be decreased somewhat.

Back to Revised and Expanded Missile & Bomb Tables.

By Gary Gore (ggore@sparky.transdata.ca).
Edited by Chris Curtis (curtis@thepentagon.com) and
Mad Dog (maddog1@Alaska.NET).

New Armor & Weapons for Rifts:

Armor:

Light Protective Suit:

The suit is a full body copy of the Altarian Body Armor. This body armor design is manufactured by Metalworks Incorporated and by REEF. The suit is skintight and can be worn under other types of body armor.
M.D.C.: 30
Weight: 4 lbs (2 Kg)
Penalties: Full Mobility, has no penalties to prowl, swim, or gymnastics
Black Market/Market Cost: 35,000 credits

Weapons:

Buffalo Laser Rifle:

The Gun is a JA-12 Laser Rifle in a case that looks a Sharps Buffalo Express rifle. Weapon is very popular with people in the New West. Weapon design is built by Metalworks Incorporated.
Weight: 14 lbs (6.4 kg)
Mega-Damage: *Laser,* 4D6 for Single Shot and 1D6x10+10 for 3 simultaneous blasts. *Grenade,* 3D6 to 10 ft (3 m) radius.
Rate of Fire: *Laser*, Single shot or three round burst. *Grenade:* Single shot
Maximum Effective Range: *Laser,* 4000 ft (1220 m). *Grenade,* 2000 ft (610 m).
Payload: 10 Shots short E-Clip, 30 Shots long E-Clip, has built in energy Canister (Cannot be removed but can be recharged) that holds an additional 30 Energy shots, and has a 4 shot pump magazine for grenade launcher.
Bonus: +1 on Aimed Shots with laser only.
Black Market/Market Cost: 52,000 credits

Pump Pistol Cartridge Automatic Pistol:

Pistol that uses the same cartridges as the TX-5 Pump Pistol but is not a pump weapon. It is a semi automatic pistol that uses that same basic action as ancient design of the Colt 1911 Automatic. Weapon design is built by Metalworks Incorporated.
Weight: 6 lbs (2.7 kg).
Mega-Damage: 4D6 MD per shot.
Rate of Fire: Standard (short burst maximum)
Maximum Effective Range: 800 feet (224 m).
Payload: Has 5 rounds in magazine and can have one round in the chamber
Black Market/Market Cost: 15,000 credits

Pump Pistol Cartridge Double Barrel Derringer:

This weapon is an effort to produce a very powerful yet compact weapon. The Weapon uses the same cartridges as the TX-5 Pump Pistol but is instead is built as double barrel Derringer. The weapon is larger than a standard Derringer but is still small enough to be concealed yet packs quite a bit of firepower. The trigger is a double catch style that allows one or both barrels to be fired at the same time. The derringer is ported so that it uses part of the force of the firing to stabilize the gun. Weapon design is built by Metalworks

Incorporated.
Weight: 2 lbs (0.91 kg)
Mega-Damage:: 4D6 MD for one barrel and 8D6 MD for both barrels
Rate of Fire: Single Shot or Two Shots Simultaneously
Maximum Effective Range:: 50 feet (22 meters).
Payload:: 2 Rounds
Black Market/Market Cost:: 5,000 credits

Pump Pistol Cartridge Revolver:

Pistol uses the same cartridges as the TX-5 Pump Pistol but is instead is built into a double action revolver design.
Weapon is very popular with people in the New West. Weapon design is built by Metalworks Incorporated.
Weight: 6 lbs (2.7 kg)
Mega-Damage: 4D6 MD per shot.
Rate of Fire: Standard (Single Shot only)
Maximum Effective Range: 800 feet (224 m).
Payload: 6 rounds in a cylinder
Black Market/Market Cost: 12,000 credits

Pump Pistol Cartridge Submachine Gun:

Submachine Gun uses the same cartridges as the TX-5 Pump Pistol but is instead uses a similar action to the pre-rifts German MP-5 Submachine gun design and has a selector for three round burst. Weapon design is built by Metalworks Incorporated.
Weight: 20 lbs (9 Kg)
Mega-Damage: 4D6 per single shot and 1D6x10 for three round burst.
Rate of Fire: Aim, Burst, Wild, Three Round Burst.
Maximum Effective Range: 1600 ft (488 m)
Payload: Has 17 rounds in magazine and can have one round in the chamber
Black Market/Market Cost: 40,000 credits

Sunaj Assassin Rifle:

New weapon design built by the Kittani that is primarily is use by Sunaj Assassins. It is a knock off of the design of the JA-12 Juicer assault rifle with the grenade launcher replaced with a longer range version of the grenade launcher that is used with the K-1 sniper rifle. The Grenades are self propelled heat seeking and have a +1 to strike.
Weight: 12 lbs (5.4 kg)
Mega-Damage: *Laser*, 4D6+2 for Single Shot and 1D6x10+20 for 3 simultaneous blasts. *Grenade*, 6D6 to 10 ft (3 m) radius.
Rate of Fire: *Laser*, Single shot or three round burst. *Grenade:* Single shot
Maximum Effective Range: *Laser*, 5000 ft (1,524 m). *Grenade*, 2,000 ft (610 m).
Payload: 10 Shots short E-Clip, 30 Shots long E-Clip, has built in energy Canister (Cannot be removed but can be recharged) that holds an additional 45 Energy shots, and has a 4 shot internal magazine for grenade launcher.
Bonus: +1 on Aimed Shots with laser only.
Black Market/Market Cost: 70,000 credits

Wellington Industries WI-25 Four Tube Mini-Missile Launchers:

This is a new mini-missile launcher design that has been produced by Wellington Industries. It has four tubes than can be fired individually or all four may be fired at the same time. The weapon is reusable and is very useful against fairly heavy armor. It is likely that several other weapon companies will soon begin producing virtually identical weapon systems.
Weight: 30 lbs (13.6 kg) without missiles or 38 lbs (17 kg) with missiles. Each extra missile weighs approximately an additional 2 lbs (0.91 kg)
Mega Damage: Varies by mini-missile type (Use modified missile table)
Rate of Fire: Single shot or all four mini-missiles only
Maximum Effective Range: Varies by mini-missile type (Go to Revised bomb and missile table).
Payload: 4, takes 15 seconds (one melee) to reload launcher
Black Market Cost: The launcher costs 32,000 credits, missiles cost extra

Wellington Industries WI-50S Fire & Forget Anti Aircraft Missile Launcher:

This launcher is a single shot hand held short range missile launcher. As the name implies, the launcher is designed for ground troops to have a weapon that they can use against aircraft. This missile launcher fills much the same role as the Contemporary Stinger missile launcher does. Unlike the WI-40M, the launcher is reusable. The launcher is heavy and must be operated on a tripod or the user must have a strength of 18 or higher. Many companies manufacture virtually identical missile launchers.
Note: SAM style missiles are missiles that sacrifice payload for higher speeds, see Chris Curtis' modified missile table for specifics
Weight: 20 lbs (9.1 kg) without missile or 60 lbs (27.2 kg) with missile. Each extra missile weighs an additional 40 lbs (18.2 kg)
Mega Damage: Varies by short missile type (Go to Revised bomb and missile table - SAM style missiles normally).
Rate of Fire: Single Shot only
Maximum Effective Range: Varies by short missile type (Go to Revised bomb and missile table - SAM style missiles normally).
Payload: 1, takes 30 seconds (2 melees) to reload launcher
Black Market Cost: The launcher costs 20,000 credits, missiles cost extra.

Wellington Industries WI-GL403 Under Rifle Grenade Launcher:

Several rifles on Rifts Earth have built in Grenade launchers but other that the ancient pre-rifts M-203 and similar weapons, no grenade launchers have been designed to be mounted underneath the barrel of a rifle. The M-203 only has one shot and is very underpowered. Wellington Industries saw that they weapon could sell quite well so they created the WI-GL403. This is designed to fit on virtually any rifle with the appropriate fittings but in some cases the rifle will need to be modified slightly
Weight: 7.7 lbs (3.5 kg)
Mega Damage: 4D6 for Fragmentation with a blast area of 12 feet (3 m). 1D4x10 for Armor Piercing with a blast area of 3 f. The launcher can also fire smoke, illumination, and chemical rounds.
Rate of Fire: Single Shot only (Equal to hand to hand attacks)
Maximum Effective Range: 1000 feet (305 meters)
Payload: 4, takes 15 seconds (one melee) to reload launcher

Black Market Cost: The launcher costs 25,000 credits, grenades cost extra

Grenades:

Anti-Laser Prismatic Aerosol Grenades:

These grenades are a bit like smoke grenades in that they do no real damage but instead they create a cloud of prismatic crystals. The crystals are in a dust like state and the crystals do causes eye and lung irritation. In these cases, the person has a penalty of -5 to strike, parry, and dodge. Any protective gear that protects eyes, nose, and moth will prevent these effects. Vision through the cloud is only slightly impaired much like looking through light to moderate fog. All lasers fired through or into the cloud have their damage reduced by half and their ranges are reduced by half as well. Variable frequency lasers cannot be set to compensate for the Prismatic Aerosol because there are too many random factors. Ion weapons, Plasma weapons, particle beams all use a laser to ionize a path through atmosphere before the actual beam is fired. Because of this, the Aerosol will reduce the weapons ranges in an atmosphere by 25% but not in a vacuum. The Aerosol does not work in space but will work in enclosed spaces even if no atmosphere is present.
Area of Effect: Effects a 20 foot (6 meters) radius with a height of 10 feet (3 meters)
Duration: 2D4 Minutes
Maximum Effective Range: About 40 meters when thrown or by grenade launcher type
Black market Cost: 800 credits each

By Kitsune (Kitsune@vabch.com).

Return

Ceres Space Defense Force Armor and Weapons:

Assault Rifle:

Although the CSDF has great experience in creating powerful handheld plasma weapons (the Personal Plasma Arc series of guns and rifles), they found that in boarding actions these weapons were often too powerful, blowing great holes in bulkheads, hulls and sensitive equipment. They realized that they needed a lighter weapon for boarding actions. The Gel gun was one of the weapons that came out of this train of thoughts, but they still needed a weapon which would be capable of lethal force. After some deliberation the research department delivered a idea to the Generals which they accepted, as it seemed like a very good idea (Actually the research department got the idea after one of the researchers watched the Pre-Rifts movie Aliens....reality mimicking fiction) The new CSDF assault rifle combines a assault rifle and a grenade launcher in one. The Grenade Launcher part of the rifle is long barreled, and lies on top of the assault rifle. Both the Grenade launcher and the Rifle part are magazine fed, with the magazine for the (automatic) grenade launcher between the grip and the shoulder stock, and the rifle magazine just in front of the trigger guard. In order to keep muzzle flash and the dispersion of gas in a vacuum to a minimum (Hot muzzle gasses will rapidly cool in a vacuum, giving away your position with a cloud, and reduce visibility), the grenades are fired by a magnetic coil, while the assault rifle part is really a low powered railgun. Energy for both is supplied by a battery, fixed in the stock. This battery provides power for 80 grenade shots, and 400 rifle shots. Normally the weapon can be recharged by linking it to the power supply of a suit, or armor (takes 2 rounds). The rifle has a integrated electronic sight with a laser distance meter, which can be used for setting burst time for grenades. It is a relatively new weapon, but because of its intimidating appearance, and horrible name, the troops already refer to it as the AARGH.
Model: ACRGL I (Advanced Combat Rifle and Grenade Launcher)
Cost: 7500 credits
Weight: 4.5 kg.(10 pounds) empty, fully loaded 6 kg (13.5 pounds)
M.D.C. of Weapon: 40
Range: *Rifle:* 300 meters (1000 feet) in an atmosphere, 2400 meters (8000 feet) in space. *Grenade Launcher;* 600 meters (2000 feet) in an atmosphere, 4800 meters (16,000 feet) in space.
Rate of Fire: *Rifle;* Equal to shooters hand to hand, bursts and sprays possible. *Grenade Launcher:* Single shot only, equal to gunners hand to hand
Payload: *Rifle;* 40 rounds per clip *Grenade Launcher:* 6 Grenades per clip (single grenades can be loaded through breach)
Damage: *Rifle:* 6D6 SDC Armor Penetrating, exploding 1D6x10 SDC, same ammo, can be selected by user at beginning of round. (Bursts can greatly increase damage. Because rounds are very powerful, if burst inflicts over 100 SDC, then it will inflict the damage of the rounds /100 in MDC, always rounding down - ex: exploding burst inflicts 280 S.D.C., it will inflict 2 M.D.C. worth of damage)
Grenade Launcher: Various types of Grenades:

- Explosive Fragmentation (normal round): 5D6 SDC in a 4 meter radius (13 feet), AND 2D4x10 SDC on contact
- High Explosive Fragmentation: 1D6 x 10 SDC in a 6 meter radius (20 feet), AND 2D4 MDC on contact.

- High Explosive Armor Piercing: 4D6 MDC in a 1 meter (3.3 feet) radius (contact only)
- Beehive (60 steel darts, shotgun pattern): 3D6 SDC Armor penetrating, +3 to strike

Special: The Grenades can be set to explode after traveling a predetermined amount of distance. This is done at the cost of one attack, by using the laser rangefinder in the rifle`s scope, and entering the appropriate distance into the grenade, which can be done to all grenades loaded at that time. Should the grenade encounter a target before the preset distance, it will also explode. This is great to clear rooms, or fire just past a barricade, and let the grenade explode then, just as it passes the blockade.

Gel Gun

Designed specifically to capture people without harming them, the gel gun has proven itself to be a invaluable tool in boarding actions, where minimal collateral damage is a must. The gun fires cans filled under pressure with a highly viscous and sticky gel. It looks like a wide barreled shotgun, with a large magazine. Upon impact the cans burst open and release the sticky gel. The cans themselves are fired by means of a magnetic coil, and do stunning damage due to their speed. The gel is composed of several kinds of long chained polymers, and is impossible to cut, even with a vibro- knife. The only way to remove the stuff, apart from ripping free a limb, is to dissolve the gel by means of a special solvent, which is supplied in spray cans. Because of the slightly greenish color, and the viscosity of the gel, the weapon is more commonly known as a "Snot Shooter" among the troops. Even though the nickname is rather derisive, the gun has proven to be highly effective in the hands of skilled users. In several instances it proved possible to knock someone down with the first shot, and to glue him to the floor with the second shot.
Model: GG-1
Cost: 7000 credits (240 per canister clip)
Weight: 6 lb. (clip weighs 4 lb.)
M.D.C. of Weapon: 35
Range: 75'
Rate of Fire: Single shot only, equal to gunners hand to hand
Payload: 12 cans per clip, plus energy for 12 shots
Damage: **Special,** The gel gun entangles and stuns (impact damage only). It can incapacitate one limb per shot. Any items held in that limb are useless. If the limb is a leg speed is reduced by 70%. The gel has 1 MDC or 100 SDC, it is comparable to a very viscous epoxy resin in feel, but firm enough to prevent anything other than minor jiggling of the limb. Any supernatural PS or a 'normal' PS of 30 or higher can rip/pull free in 2D4-1 melees. The limb cannot be cut free, this results in the blade being stuck too! As a matter of fact, the gel will stick to just about anything, resulting in the victim sticking to just about anything, from floors to other people who tried to help them.

PPA MKII

The Personal Plasma Arc MKII is the standard personal sidearm of the crews onboard the CSDF`s warships. Larger weapons are usually issued only to the Marines and the SAS members onboard. It is usually carried in a shoulder holster on the outside of the uniform. It has superior power compared to most handguns in the orbital community, and is very lightweight. In appearance it looks like few other weapons: it is made entirely from ceramics and plastics and has a very distinctive large rectangular muzzle. The weapon is the result of much engineering and research,

and represents the best in (personal) weapons currently available to the CDSF. The weapon fires powerful bolts of plasma, which are generated by forcing xenon gas through a electrical arc (hence the name) and "packing" the resulting plasma in a magnetic bubble which is then compressed and fired out of the gun.
Weight: 750 grams (1.6 lbs)
Length: 21 cm (8.4 inch).
Height: 14 cm (5.6 inch).
Width: 3.6 cm (1.44 inch)
Price: 8000 Credits (About 6000 IOU in the rest of the orbital community)
Mega Damage: 3D6 MD.
Range: 200 meters (667 feet) in atmosphere, 1600 meters (5334 feet) in space.
Rate of Fire: Equal to gunners hand to hand.
Payload: twelve (12) shots per E-clip (small E-clip does not fit).
Bonuses: Accurate: this weapon is very accurate, +1 to strike.

PPA MKII S

The PPA or Personal Plasma Arc MKII S (short) is a very powerful and highly concealable small handgun, and is standard issue for all CSDF officers. It is a scaled down version of the PPA MKII, but without a loss of power. This little handgun fires powerful bolts of plasma, but is relatively short ranged. Also it has only power for seven bolts before the small energy clip is empty. A plus of this weapon is that the grip folds forward and upward against the casing, rendering it in the form of a semi oval. This reduces its size so much that it fits in the palm of ones hand. This small size means that it can be fitted into a special holster which is fitted on the forearm inside of the (wide) uniform sleeve. A flick of the wrist then throws the handgun out of the holster, at which time it unfolds, straight into the palm of ones hand. Although this practice requires some training, it results in a immensely fast draw, with all the advantages this brings with it, and a almost undetectable gun. Due to the holster being fitted for a single person, there is no chance of the pistol accidentally falling out of the holster. Conversely, the holster is very unsafe to use if it is not worn by the person it was fitted for.
Weight: 550 gram (1.21 lbs)
Length: 14 cm (5.6 inch) unfolded, 10 cm (4 inch) folded
Height: 11 cm (4.4 inch) unfolded, 7.5 cm (3 inch) folded
Width: 3 cm (1.2 inch)
Price: 8,000 Credits, including forearm holster (About 6,000 IOU in the rest of the orbital community)
Mega Damage: 3D6 MD.
Range: 45 meters (150 feet) in atmosphere, 360 meters (1200 feet) in space.
Rate of Fire: Equal to gunners hand to hand.
Payload: Seven(7) shots per small E-clip (large E-clip does not fit)
Bonuses:

Fast Draw: gives +1 to initiative
Light weight: +1 to strike.
Concealable: - 70% to detect in forearm holster.

CSDF uniform:

The standard uniform for the CSDF, this is worn by all service branches with only minor cosmetic

differences. (Go Here for a picture of the uniform). It consists of three basic pieces, namely:

Skinsuit: this piece is custom made for each soldier, and is a black one piece suit which covers the entire body. Part of the suit are magnetic shoes and (white) gloves. The torso of the suit looks armored, but the thin plates house a small oxygen supply and a emergency beacon. The suit opens over the front. This suit has only minimal armor, but is fire resistant, acid resistant, and airtight. It is also worn in a spacesuit and in powered armor, as a matter of fact it is the basis for all of the CSDF personal clothing.

On each lower arm there are attachment points for various kinds of hardware. Normal is a vibro-dagger with sheath, and for officers a holster fitted for that specific person which houses a PPA MKII S. (Note: it should be obvious from the name, but you do NOT wear anything underneath this suit.)

Jacket: This piece comes in several standard sizes. It is a rather heavy affair, but it is well armored and isolated. When one puts it on it locks airtight over the plates fitted on the torso of the skinsuit. In a emergency a clear plastic cover can be drawn from the back of the jacket, over the head. When this is then fitted over the collar a small electric charge permanently hardens the memory plastic into a dome shape, which than acts as a airtight helmet. in combination with the oxygen supply in the skinsuit this acts as a space suit. The dome can be softened by the application of another electric charge of a specific current, after which it folds back into the suit. The triangular black plastic patches on the shoulders (mirrored on back) can actually detach and reveal attachment points. Regular soldiers and Noncoms have a shoulder holster hanging from these points. Flashlight patches can also be worn, and assorted other equipment can also be attached, including oxygen tanks. Several pockets are also fitted into the jacket, and there is room for two spare E-clips (three small ones) for the wearers PPC.

Trousers: Worn over the skinsuit, they latch onto the skinsuit at the underside of the torso and at the shoes. Armored and insulated, with fire resistance built in. They contain several deep pockets, one of which contains field dressings, and another one emergency ration. There are several attachment points at the hip for equipment such as a canteen, E-clips, survival equipment and other material.

No headgear is worn, except under special circumstances and with parade dress. The headgear for such occasions is a black baseball cap with unit insignia for all personnel, except for active members of the SAS which has held on to the famous red beret.

Statistics:

Skinsuit:

Weight: 3.5 kg (7.7 lbs)
Damage: 30 SDC!
Air supply: 1 Hour
Special: Airtight, fire resistant, acid resistant, Fitted to person.
Cost: 4,000 Credits (About 3,000 IOU in the rest of the orbital community)

Jacket:

Weight: 4.5 kg (9.9 lbs)
Damage:

Arms(2): 5 MDC
Body: 9 MDC
Head(plastic dome): 6 MDC

Special: Fire resistant, isolated (-200 centigrade to +500 centigrade)
Cost: 6,000 Credits (About 4,500 IOU in the rest of the orbital community)

Trousers:

Weight: 3 kg (6.6 lbs)
Damage:

Legs(2): 6 MDC
Lower abdomen: 6 MDC

Special: Fire resistant, isolated (-200 centigrade to +500 centigrade)
Cost: 6,000 Credits (About 4,500 IOU in the rest of the orbital community)

By Mischa (mischa.campen@tip.nl)
Minor revisions by Kitsune (Kitsune@vabch.com).

Return

Heckler & Koch Meteor Railgun:

This railgun was specifically made for use in space. Railguns are very powerful weapons, and are more difficult to defend against than pure energy weapons, but in space they have a large disadvantage due to the recoil that they produce. A combatant must be secured to a large object, or have special software that allows his suits thrusters to compensate for the recoil.

Securing oneself is not always possible, and the thrusters in a suit are usually not powerful enough to compensate immediately for the recoil of a large railgun, resulting in a "rocking" effect when the weapon is fired. Needless to say, this is hardly conductive to better accuracy.

The Meteor railgun bypasses these disadvantages through its design: It looks a lot like a Bazooka, and is in fact held like one too. At the back of the railgun is a small but powerful high-impulse thruster, mounted on a powered movable base. Every time that the gun fires the thruster immediately counters the recoil it generates. Since the weapons firing rate and the thruster have been carefully balanced, there is none of the rocking effect normally encountered when the thrusters of a suit compensate for recoil. In addition to the thruster the railgun is equipped with its own laser targeting system, microchips, and a datalink to the users suit. The user can select several modes of fire: Normal, Planet, and Deadeye.
When fired in normal mode the gun simply counters recoil and holds the gun steady.
When fired in Planet mode the gun compensates recoil as if in a 1 G gravity field and atmosphere.
When fired in Deadeye mode the gun uses its laser targeting and the datalink to the wearers suit (more specifically its radar) to identify a targets size and distance. According to this the gun swivels the thruster to disperse the burst it fires into a shotgun-like pattern for maximum hit probability for a target that size and at that range. The drawback is that the damage done is less, because of the dispersal of the burst.

The first unit to be supplied with the gun was the detachment of SAS personnel who served aboard the De Ruyter class Destroyer. Overall consensus was that the guns were "Capable of hitting a soda can in a different la grange point". The soldiers were less pleased with the guns handling in a atmosphere, saying that "the thruster made enough noise to waken the dead".

This Railgun was the standard weapon for all of the Space Predator power armors on board of the De Ruyter.

The railgun fires 2 millimeter darts of depleted Uranium at a huge speed but moderate rate, so each burst lasts nearly a second. For normal use the ammo is supplied by a drum wich is bolted to the powered armor of the user. Reaction mass for the thruster is supplied by the same drum, and through the same chute through which the darts are supplied. Each drum holds enough ammo and reaction mass for 40 bursts. Power is supplied by the users powered armor.
In a emergency the gun can be fed by a clip, wich holds power, ammo and reaction mass for 4 bursts.

Model: Heckler & Koch Meteor MK1 Railgun (space)
Purpose: Assault
Weight: 230 lbs. (104 kg)
Mega Damage: 2D4 X 10 per burst of 50 darts, 1D4 X 10 + 10 per burst in Deadeye mode.
Rate of Fire: Equal to the Shooters Hand to Hand attacks (usually 4 or 5). Burst and sprays not possible.
Maximum Effective Range: 5,000 feet (1,520 m) in an earthlike atmosphere and 32,000 feet (12,160 meters) in space

Payload: 2000 round drum for 40 bursts, or one 200 round clip for 4 bursts.
Special Features: Due to construction has +1 bonus to strike in space. When engaged Deadeye Targeting system gives a total bonus of +4 to strike in space. Deadeye gives +2 bonus to strike under planetary conditions.

By Mischa (mischa.campen@tip.nl)

Return

Battle Link:

Battle Links are special linkages using very high speed self aware computers, fire control system, sensor systems, and communication systems. The system greatly enhancing their chances to hit, due to better sensor readouts and a more concentrated volume of fire that can be brought to bear on one enemy. Battle Links are especially efficient when it comes to concentrating fire on one or two targets at a time, although point defense also gains accuracy in the link. Another plus is that the ships get a bonus to dodge, due to better information on incoming enemy fire. Unfortunately, the systems are very large and can only be carried on certain classes of ships. Only Battleships and Cruisers carry these systems. The main control system is large enough that it is only mounted on large battle cruiser sized ships and larger. It is general not mounted on carriers (or even battle carriers) due to the fact that most of those ships require most of the ship for fighters and carriers are designed to avoid combat. The slave unit is carried on cruiser sized and larger ships. The only exception is that the neural computer on the Foxfire class Neural Prime can act as a slave unit for the neural prime system.

There is one exception to the size requirements. The *Free World Council* HAS a special version of the battle link for fighters, and it uses a modified Ferret class corvette as a control center. The Ferret has NO reloads for its cruise missile launcher, as most of the space in the holds is taken up with the Battle Link controls, computers and communication system. If the Corvette is destroyed, the Battle link is lost. Bonuses to strike are as described below, only the bonus for point defense is lost, and all other bonuses are for fighter sized weapons. This system is believed have been designed by a brilliant machine Person Engineer working for the Free Worlds Council.

The Battle Link computer system is only available to a few governments. The Consortium Armed Forces and Trans-Galactic Empire Military are the major militaries that have the system. Unlike many other systems, they are not shared with their allied governments. The Human Forces Navy is believed not to have this system but it is likely that by now that it might have been borrowed from the CAF but it is unlikely that any Independent Forces Navies have this system. The system for the Kreeghor navies was designed by machine person minions so is probably retained by them. The Free World Council Navies have stolen the system from the Kreeghor and it is believed that the REF has stolen the system from the Kreeghor but have had not began refitting any of their ships with it. Finally it is believed that the United Worlds warlock is working on a telepathic/magical version that will be unable to be jammed.

The system is very expensive and is about 5 percent of the base cost of the warship if part of the ships original construction. It is assumed that this a component of the of newer ships but the GM should determine if this has already be figured in or adds to the cost of the ship. For the CAF it is assumed that the Protector, Warshield, Paladin, Champion, and Fox Fire classes have this system along with most large defense fortresses. Older ships such as the Yamato and Everest do not the system as original but some may have the system as add on. Warshield cruisers not in service with the Caf has the system either removed or never was put in the ship. For the Kreeghor it is assumed that the Dreadnoughts and Smashers carry the system with older classes not carrying the system. If the system is added on later, the system is more expensive than it costs as an integral ships. In these cases it costs 10% of the original cost of the ship.

Limit to size: *Main control system:* Only large Battlecruiser and larger. *Slave System:* Only Cruisers and larger with the exception of the neural prime. Frigates and corvettes and fighters do not have access to the battle net, although the Free World League is rumored to be testing a miniature battle link specifically

for use with a group of fighters, with a modified corvette acting as a control nexus.

Bonuses from the link:

Battle Link in number of ships:	Bonus for Heavy Weapons [1]	Bonus for Point Defense Weapons [2]	Bonus for Dodging [3]	Bonus for Combat Initiative
2	+1 to Strike	None	None	None
3 to 6	+1 to Strike	+1 to Strike	None	+1 to Initiative
7 to 11	+2 to Strike	+1 to Strike	+1 to Dodge	+1 to Initiative
12 to 18	+2 to Strike	+2 to Strike	+1 to Dodge	+2 to Initiative
18 to 26	+3 to Strike	+2 to Strike	+2 to Dodge	+2 to Initiative
27 or more	+3 to Strike	+3 to Strike	+2 to Dodge	+3 to Initiative

Notes:
[1] These bonuses are if the group is concentrating its fire on a group(s) of targets, NO BIGGER in total, than HALF the linked group. If the total target group is a quarter or less of the size of the linked group, the bonuses are doubled. Does not include self guided missiles due to the fact that missiles have their own tracking systems but does include missiles that are guided to the target by ships designators. Bonuses also include energy weapons and rail guns
[2] Does not include self guided missiles due to the fact that missiles have their own tracking systems but does include missiles that are guided to the target by ships designators. Bonuses also include energy weapons and rail guns.
[3] The dodge bonus only applies to dodging heavy starship weaponry such as Lasers and Railguns. It does not apply to dodging missiles or lighter weaponry such as those of fighters (for FWC fighter system bonuses apply to dodging fighter sized weaponry as well).

System Limitations:
As might be expected the system main limitations are the limitations of range and can be jammed. Jamming can be used effectively to break the links between the system. The system can link up to eight slave units to one main control system. The ships with slave links must be within 37,280 miles (60,000 km) of the main control systems. Main control system can also be linked but the link takes one of the slave links leaving a maximum of 7 slave units being used. A total of 64 ships can be linked before the whole system becomes unstable. When main control systems are linked, there is a maximum range of 186,400 miles (300,000 km).
The Free Worlds Council fighter system works the same way except ranges between corvette and fighters have a maximum range of 1,491.3 miles (2,400 km) and between corvettes of 7,450 km (12,000 miles) and has a maximum of 8 fighters for one corvette or if in a large link 1 corvette and 7 fighters with a maximum of 8 corvettes and 56 fighters.

Example:
A CAF Battle group of seven Warshield class cruisers, one Neural Prime, and a Protector class

battleship (9 link capable ships) attacks a Kreeghor dreadnaught and its escort of six cruisers. Two of the Warshields attack one Kreeghor cruiser, and the rest of the ships decide to concentrate ALL of their firepower on the one Dreadnaught, and thus they gain the following bonuses: +4 to strike and +2 to initiative (double the normal value). The Dreadnought is in serious trouble. Because All of the CAF ships are in a single battle link, they get a +2 to strike on their point defense.

Cost: 5 percent of cost of ship if part of the ship at the time of construction and 10 percent of the cost of the ship if it is an add on later

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By Mischa (mischa.campen@tip.nl) and by Kitsune (Kitsune@vabch.com).

Return

Star Hammer (CCW):

Ever since the CAF learned about the fold engines that the REF uses, they have been trying to duplicate the process. Such a method of travel would give the CAF the same huge strategic advantages that the REF had in its war with the Kreeghor. Unfortunately all their efforts have so far come to nought. Fold travel remains out of the reach of the CAF. Most of their attempts at fold engines resulted in nothing at all, but one attempt did indeed fold. Unfortunately it never came out of the fold. Strangely enough the secluded sun around which the tests were conducted displayed some severe solar flares shortly thereafter. No one really paid much attention to it though, as they were concentrating on finding the flaw which prevented the experimental fold engine from reemerging into normal space.

When a second attempt with a similar engine resulted in another failure to unfold and more Solar Flares, someone DID notice. After some deliberation, and studying of the ships logs, the scientists noted that at the same time they had conducted their tests, there had been fluctuations in the gravity field of the sun. This in turn had led to the solar flares, some of which had been quite violent. It was clear that they were onto something. It might not have been a method of travel, but the scientists were unto something.

For the third (and last of the expensive tests) test, they asked one of the CAF Generals in command of the research department to attend. With both the General and extra equipment in attendance, the third test yielded the same results: A disappearing generator, and some spectacular solar flares. The General was sufficiently impressed to appropriate more funding for research into the phenomenon, and the extra equipment showed what had happened.

As the generator went into the fold, it fell into the solar gravity well, where it attempted to unfold. During the attempt to unfold, the generator smoothed out the gravity well in a small area in the center of the sun. This caused the core to expand, as there was no longer a gravitational force to keep it together. As soon as the generator appeared (inside the star!) the gravity field came to full power again, causing the stars core to collapse again, which caused solar quakes. These showed up as solar flares.

In the following years, the research team spend humongous amounts of money, all with the blessings of the General. But it could not last: As they were finishing the first full-size operational prototype of their "Stellar Core Destabilizing Gravity Wave Generator", the CAF performed a general audit and, to the horror of the auditors, they found that a amount of some 900 billion credit had gone into a sort of "Research Department Black Hole" as one auditor put it. The CAF general staff descended as hawks upon the hapless general and his researchers, and the end seemed nigh for the "Starhammer Project" as it was informally known. The only thing that saved the project and its proponents from oblivion was the fact that to disassemble the giant prototype Starhammer would have cost far more than to finish it. So, upon advise from the scientists and the accounting department, the prototype was finished and towed to a uninhabited star system. There it would undergo its live fire test. If it worked, the CAF would gain a new weapon. If it failed.....

After remote control sensor packages had been distributed around the system, and on the three lifeless planets, and all ships had taken a safe distance from the target star (about one light month out) the huge Starhammer generator was activated. A large spherical field enveloped it, and then it was gone. In the observing ships, everyone kept a close look at the sensor readouts. For nearly a minute nothing happened, and tension mounted. Then the sensors registered a enormous amount of gravitational flux and hyperspace disturbance, which faded away in less than half a minute. During that time, nearly two thirds

of the sensors lost their remote FTL link. But the few sensors that remained painted a horrible picture:

As the Starhammer attempted to unfold in the hart of the star, it attempted to smooth out the stars Gravity field (causing the huge gravity and hyperspace disruptions). For a few seconds it succeed. With the pull of gravity no longer keeping the star together, it began to expand rapidly. When the generator appeared in the hart of the star, it was incinerated, and the stars gravity field returned. With a enormous crash the star collapsed again, and the huge shock wave compressed layers of hydrogen and helium that would not have begun fusion for billions of years far beyond the fusion limit. The star began to burn hundreds of times as bright as normal, and together with the light it emitted a vast Electro Magnetic Pulse sped out from its surface at nearly light speed. The EMP burned out every probe that it enveloped, but some of the outlying probes used their FTL sensors to gather more info before the EMP reached them. In the waiting ships the generals, scientists and everyone else present watched in utter horror as the star, now hundreds of times brighter than normal, began to shed its outer layers in a attempt to dissipate the flood of energy. Following behind the light and the EM Pulse, a wave of plasma swept across the system at a leisurely 50 percent of light. It incinerated everything in its path, and began broiling the planets as it passed by them. Having survived the EMP, even the last probes were obliterated as the waves of plasma swept over them. In effect, the star had gone Nova!!

In the observing ship one of the CAF admirals put everyone thought into words: "Well guys, it works. Now what in HELL`S NAME ARE WE GOING TO DO WITH IT?!"

With the Starhammer technology the CAF has without a doubt the most powerful weapon in the three galaxies in its possession. Without a doubt it is also the most expensive weapon ever built by them. With the power to destroy entire systems, and a cost of dozens of battleships, it is in doubt that the CAF will ever build another Starhammer, for when the leaders of the CCW heard of the weapon, they were even more horrified than the military had been. Some even proposed to destroy the designs, and to forget about the entire thing. The power to destroy entire systems was almost too fantastic and too horrible for them to contemplate. As is, the CCW has locked away the plans for the starhammer in a very safe place, and has destroyed all references to it, even to the point where some of the more talkative people allied with the project have met with some rather fatal "accidents". Currently only the general staff, and some of the highest civil leaders of the CCW know of the whereabouts of the starhammer plans. The team of scientists has been broken up for good, and CCW intelligence is keeping close tabs on them.

This starship design uses modified starship speed and ranges. See Revised Starship Rules for Phase World for more details

Note: The writeup for this Starhammer is for a military version, with drives, shields and a small crew section. This is only so that the Starhammer can be flown to its target under its own power. Even so, it has no armament of itself and will require a escort. No one is aboard at the time of firing (they`d better not be...) GM`s, it should be noted that such a weapon is often utterly useless in a military campaign, and should not be used in most campaigns.

A possible use would be as a plot device, someone has stolen the plans, and the players have to get them back before the thieves sell them to the Kreeghor. Or the players can BE the thieves, and not know just what they have stolen. All of a sudden they would have CAF security hot on their tails....

Model: Starhammer Generator.
Crew: None, fully automated(requires 100 man to fly though)

Vehicles: 8 Proctor Heavy Starfighter (only meant for getting the crew off the Starhammer.)

MDC by location (per generator):

Main body:	300.000
Fighter Hangar:	3,000
[1] Life support/Command section:	7,000
[2] Drive system:	20,000
[3] Shields:	5000 Each side

Notes:
[1] The command module is the only part of the Starhammer to have life support. It is a small target, partially imbedded in the generator: -2 to hit.
[2] Destroying the drive system means that the generator can no longer maneuver, it will drift at its last heading.
[3] The shields are variable, and can all be combined into one shield. The shields regenerate at the rate of 5% (1,500 MDC) per round.

Speed:
Sublight: Can accelerate at a speed of 0.3 percent of light per round
Stardrive: Gravitonic, maximum speed is 3 light-years per hour.
Stardrive(special): Can perform a single FTL Hyperspace Fold operation. Effective range: 15 light minutes.

Statistical Data:
Length: 2.6 Miles (4,170 meters)
Height: 4,200 feet (1,260 meters)
Width: 4,200 feet (1,260 meters)
Weight/Mass: 520 million tons
Power System: Antimatter with a five year live span (normally refueled every year)
Cargo: None
Market Cost: 700 Billion credits for a starhammer. The Kreeghor and the black market will pay enormous amounts of money (100+ Billion) for the blueprints for the starhammer. IF they knew about it off course.

WEAPON SYSTEMS:

1. **Starhammer Generator.:** The generator folds into the nearest Stellar mass, and during re emergence into normal space cancels all gravity inside the star. This causes a rapid expansion of the star. The force with which the gravity inside the star is canceled creates waves of gravitational and hyperspace disturbance which will severely damage any active (as in anything but cold shutdown) FTL drives and FTL communicators.
   As soon as the generator emerges into real space it is incinerated in the hart of the star, and gravity returns, causing the star to contract again. The contraction is so powerful that layers of helium and hydrogen which normally wouldn`t reach fusion for billions of years are compressed until they DO start a fusion reaction. When this happens the star starts to "burn" hundreds of times as brightly as normal, and a huge electromagnetic Pulse is thrown outwards. Because the temperature of the star rises greatly too, the outer layers of hot gas are thrown off in the form of a expanding cloud of superheated plasma moving at half lightspeed. This process continues for several days, and

sterilizes the entire star system.
Range: The starhammer has to be within 15 light minutes of the star in order to work.(no penalties to hit, if you can get it there, IT WILL WORK! period.)
Effects Taken:

First Wave: The first damage comes from the Gravity and Hyperspace disruption caused by the weapon. This damage happens to ALL FTL drives and FTL comm systems that have power running through them AT THAT TIME! It is also instantaneous from the moment of activation of the Starhammer. The only way to avoid having damaged FTL systems is to have them in cold shutdown at the time (something NOT normally done).

Duration: Once, at beginning of Nova explosion.
Damage:

- In a radius of 15 light minutes : ALL powered FTL drives and comm systems are destroyed, turned into worthless junk!
- In a radius of 30 light minutes : 98% All destroyed. 2%:Minor repairs only! 4D6 minutes before drive and comm are operational.
- In a radius of 60 light minutes: 88 % All destroyed. 10% repairs, 2D6x10 minutes worth! 2% minor repairs, 4D6 minutes worth.
- In a radius of 120 light minutes: 66 % All destroyed. 20% Major repairs, 3D6x10 minutes worth.10% repairs, 2D6x10 minutes worth! 4% lucked out, no damage!.
- In a radius of 240 light minutes: 30 % All destroyed. 40% Major repairs, 1D6 x hours worth. 20% repairs, 3D6x10 minutes worth! 10% Lucked out, no damage!
- 240 light minutes + (4 light hours!) Outside of this Area, the damage done to drives and communication systems can all be repaired before the EMP and the explosion front reach the damaged ship.

Second Wave: The next damage is done by the EMP radiating out from the star at near lightspeed. As soon as a ship sees the Nova, it will be hit by the EMP, the light and the pulse having traveled together from the stars surface. The EMP will do damage to shields and electronics, burning out electronics.
For gaming purposes, the EMP has a damage rating. This is how much damage the pulse will inflict on shields. Once any shields are penetrated, however, the damage works differently. The EMP damage is recorded separately from normal physical damage. The amount of "damage" inflicted by the EMP is compared to the amount of main body remaining. The percentage of damage inflicted is determined in relation to the main body: (damage / main body) x 100 = percentage.
For every 10% damage from the EMP, the following penalties apply: The target will be at -1 to Strike, Parry (if appropriate), and Dodge. In space, target acceleration will be reduced by 15% and in an atmosphere, top speed will be reduced by 15%.
If a ship takes 60% or more of its main body in EMP damage, then the ship or vehicle will be disabled completely. All weapon, navigation, and other systems will shut down. The ships Emergency life-support and emergency communications are likely to work, but nothing else. Note that repair becomes impossible too, as ALL systems are burned out.

When crossing universes, some ships would probably be immune to the EMP. These include the U.W.W. ships and the UFO Intruder ships from Phase World, the semi biological protoculture based systems from Robotech, and the Unusual hull construction of the Vorlons, Shadows, and races that copied the first ones technology from Babylon 5."

Duration: The EMP lasts for 2D6+1 rounds before it passes, apply damage once every melee.
Damage:

- In a radius of 20 light minutes : 4D6x10,000 MDC (roll each only ONCE, apply every turn thereafter)
- In a radius of 40 light minutes : 2D4x10,000 MDC
- In a radius of 80 light minutes : 1D4x10,000 MDC
- In a radius of 160 light minutes : 4D6x1,000 MDC
- In a radius of 360 light minutes : 1D4x1,000 MDC
- In a radius of 420 light minutes : 2D4x100 MDC
- In a radius of 840 light minutes : 5D6x10 MDC
- Outside of a radius of 840 light minutes the EMP is too weak to do anything but disrupt radio traffic badly for the duration.

Notes: This is damage for a Cruiser sized vessel. Multiply EMP damage by a factor of two for Battleships and larger (includes Dreadnoughts) Multiply by eight for asteroid fortresses, and divide by a factor of two for smaller ships (Frigates, Fighters etc.).

Third Wave: Damage is done by the enormous waves of plasma that are thrown out by the Nova. Although they move at only about half lightspeed they do more damage than the EMP, and the star can continue to throw out waves of plasma for days before it subdues!

Duration: The duration of the Nova is 1D6 Days! For another 1D4 days the Nova burns with half its original intensity (reduce all damages by half)
Damage:

- In a radius of 20 light minutes : 3D6x100,000 MDC (roll each only ONCE, apply every turn thereafter)
- In a radius of 40 light minutes : 2D4x100,000 MDC
- In a radius of 80 light minutes : 5D6x10,000 MDC
- In a radius of 160 light minutes : 6D6x1,000 MDC
- In a radius of 360 light minutes : 3D4x1,000 MDC
- In a radius of 420 light minutes : 5D6x100 MDC
- In a radius of 840 light minutes : 2D4x100 MDC
- In a radius of 1680 light minutes : 3D6X10 MDC
- Outside of a radius of 1680 light minutes the Nova does no appriciable MDC damage, although radiation levels will be deadly for unshielded persons for many more light days out.

Notes: This is damage for a Cruiser sized vessel. Multiply Plasma damage by a factor of two for Battleships and larger (includes Dreadnoughts) Multiply by eight for

asteroid fortresses, and divide by a factor of two for smaller ships (Frigates, Fighters etc.). Imperious to energy spell will not completely eliminate damage but will instead take 10% from the particles moving at the ship at 50% of light.

Note on Star Types: These damages are for a perfectly ordinary G-type star, like our sun. Different kinds of stars will react differently to being hit with a Starhammer. I have noted the conversion figures for some other star types below:

White and Blue Giants: These will turn into Supernovae! Duration stays the same, but all ranges are x 6, while damages are times x 10! after the event, there is nothing left of the star but a fast spinning Black Hole!
Red Giants: Red Giants also turn into Supernova`s, but a little less spectacularly: ranges are still x 6, but damages are x 5. After the event, a very hot, very fast spinning Neutron star is left.
White Dwarfs: a White Dwarf will still ignite, but less fiercely: ranges are x 0.5, the damage for the EMP and the Gravity/Hyper wave are normal, but the Plasma Wave is x 0.25 .
Orange Dwarfs: Orange dwarfs will still ignite, but all ratings are x 0.75.
Red Dwarfs: Red dwarfs will still ignite, but all ratings are x 0.25.
Brown Dwarfs: A Brown Dwarf is a star that never was: not massive enough to reach fusion, it is only warm because of the immense pressures in its center. The Starhammer WILL ignite it: Range x 2, damages for EMP x 3, damage for Plasma x0.25, duration: 1D6 HOURS, after that, the Brown dwarf has become a Red Dwarf, but one with a short life span (red dwarfs are the longest burning stars but these stars will be unable to sustain fusion for long periods of time) of 1D6 x 100,000 years
Pulsars, Black Holes: Not really relevant is it? No one will fight in the vicinity of these, or live there. If you do need the damages, make up something VERY spectacular (as in "Eventually visible in other galaxies")

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Return

Graviton Bomb Missile:

Since the REF came to the three galaxies they have, with the help of the C.C.W. and the planet of New Coventry in particular, greatly upgraded much of their systems. One of the most notable advances was that in missile technology, and the acquisition of new warheads. Especially the Gravity Well warheads generated great interest with the REF engineers. Upon first seeing one of those, a REF engineer remarked:"Hey, this looks a bit like a part from a Fold Engine". The REF was very interested in trying to power up the performance of the Gravity Well warhead, since it looked so familiar to them.

In cooperation with engineers from New Coventry (with which the REF had formed a defense alliance) the REF set out to improve upon the weapon and after two years of work the first prototype of the new warhead was tested in the Hades system. This was because it was very secluded, and contained no habitable planets. The Factory Satellite was at the other end of the system, well out of the calculated range of the warhead.

The test was a resounding success: By enlarging the warhead, and boosting it with protoculture systems, it yield was greatly enhanced. So powerful was the bomb, that it was in fact a entirely new weapon. Instead of simply simulating a localized deep gravity well, the new bomb actually formed a small black hole at the center of a powerful spatial distortion. Its destructive power was immense.

In the third test of the weapon system, it became clear just how powerful the new weapon was. The bomb was activated close to a asteroid, and the usual effects came into being. But this time, the black hole at the center actually touched the asteroid. In a flash of hard radiation it was swallowed into the black hole, and the Distortion grew immensely! The distortion reached the research ship observing the event, and did horrible damage to it, killing nearly half of the crew. Later it was determined that the asteroid had in fact fed the black hole, so that before falling out of the normal Space/Time continuum it had grown considerably in size, and the distortion had grown proportionally. The new weapon was so powerful that the REF and New Coventry almost abandoned the research on it, and severe measures were taken to makes sure that no larger accidents could happen in further testing of the Graviton Bomb.

The nature of the weapon has made it to be regarded as potentially planet destroying, as the black hole could swallow enormous amounts of matter, and grow to its maximum limits, before it falls out of the universe. This would cause areas with a radius of 1600 miles to be utterly annihilated due to the stress the disruption would cause in a planets crust. It is not unlikely that the crust could shatter at the worst hit location, and that the molten magma underneath would spill out like a huge circular leaking wound in the planets crust. Therefore, if these weapons are used against planetary targets, the bomb will usually be set for a air burst type of detonation, as opposed to a direct contact activation. This limits the destruction the weapon causes to acceptable levels. Orbital forts, on the other hand, can easily be annihilated by just a single bomb, without great danger to damage a large part of a habitable planet.

Currently only the REF and the New Coventry Navy posses these impressive weapons, and that only in small numbers: Less than 100 of these complex weapons have been made, and production is carried out in the Factory satellite at a slow rate of 4 bombs per month. There are no current plans for stepping up production (although a production rate of 50 bombs per month is immediately attainable). In all honesty, the REF and the New Coventry government are not likely to allow these weapons to be used unless the conflict is severely threatening to either group.

There are no plans to sell the designs for the graviton bomb to any other group. As a matter of fact, the

CAF only suspects that these weapons exist, while the Kreeghor have no idea at all that such a weapon is in existence. Knowledge of these weapons in the REF and the New Coventry navy is severely limited too, as only a few generals, and admirals, know of the weapons. Ship captains who are trusted with the weapons must have proven themselves to be reliable, and have served a minimum of two decades in either of the militaries. Even then they are not allowed to tell anyone on the ship of the nature of the weapon, and in the inventory it is listed as "Missile, Antimatter, Bombardment, Heavy." in order to spread confusion as to the nature of the weapon. Use of the weapon MUST be approved by the government of the relevant navy, unapproved use and or disclosure of the nature of the weapon can result in a court martial for the offending person, and civilians who find out about it can very well be tried as spies.

Currently, the REF and New Coventry are deciding weither or not they will trade the Graviton bomb technology with the CAF in exchange for their GRAZER technology, and other secrets, such as Neural Prime technology.

The missile has performance characteristic that are aporximately equal to a cruise missile but the missile is in actually the size of a starfighter and cannot be used in a cruise missile launcher and instead needs a special launcher.

Notes: This weapon is very powerful and may upset game balance. This weapon should be treated with restraint and in only limited numbers.

Model: Graviton Bomb
Crew: None, fully automated

MDC by location:

[1] Main body:	500
[2] Drive system:	200

Notes:
[1] Destroying the main body of the bomb will utterly destroy it.
[2] Destroying the drive system means that the bomb can no longer maneuver, it will drift at its last heading (but it is not inactive!)

Speed:
Sublight: In space the Missile has an acceleration of 10% of light per turn (far faster than any starship)
Range, Space: 4,000,000 miles (6,437,376 km/ 21.5 light seconds) in space
Atmopshere: In an atmosphere, the missile has a top speed of Mach 25 and is trans-atmospheric
Range, Space: The Missile range is 8,000 miles (12,875 km) in an atmosphere

Statistical Data:
Length: 60 ft (18 meters)
Height: 24 ft (7.4 meters)
Width: 24 ft (7.4 meters)
Weight: 35 tons (31.5 metric tons)
Market Cost: 470 million credits per Missile. The Kreegor and the Black Market would pay huge amounts of money (10 billion+) for a working model of a Graviton Bomb if they knew about it. (Working, not Activated please...)

Weapon Systems:

1. **Graviton Bomb:** The bomb generates a localized spatial disturbance, powered by a small Black Hole in the middle. The disruption effects everything in its radius. Ships inside of the disruption are unable to go FTL, no matter how large or powerful they are. The disruption is so great that the black hole quickly "falls" out of the universe, which in return dissipates the disruption. Before this can happen the black hole actually can swallow whole ships though, and will greatly increase in power and size as a result, before it disappears.
   Mega Damage: The disruption effects the entire ship. The damage is a percentage of the damage the main body of the ship has if the ship is undamaged. This damage is then applied to the ships shields first and all remaining damage is passed to the main body. If the ship has no shields it takes full damage. If the damage exceeds the main body, which is very likely, the ship is destroyed. If the ship survives, damage is applied to all hit locations on the ship. This is done by taking the damage to the main body and dividing it by the undamaged main body of the ship. This is the percentage that all hit locations will loose in damage*. The further away from the center of the distortion, the less damage a ship takes. Percentage of Damage Taken:

   In a radius of 10 miles(16 km) : 3D6 x 12 %
   In a radius of 20 miles(32 km) : 3D6 x 6 %
   In a radius of 40 miles(64 km) : 3D6 x 3 %
   40 miles plus: out of this range the distortion has no damaging effect any more.

   Duration: The Black Hole exists for a full melee round, before it falls out of the normal Space/Time continuum, and takes the disruption with it.
   Additional: In the event a Critical Hit is made, it is assumed that the targeted ship or object is destroyed, as it is swallowed by the Black Hole! No Saves, no force field can save you, the targeted object is GONE! Also, for every ton of matter swallowed by the Black hole, the disturbance grows by the square root of the mass (in million tons) it has swallowed. Smaller ships are less severely effected, as they undergo a smaller amount of gravitational gradient in the disruption. The larger a object is however, the more damage it will usually undergo. The black hole cannot physically swallow more than about 1.6 billion tons of matter in the single single round it is in existence, which translates into a maximum effective radius of 1600 miles for the disruption. It will only swallow objects it directly touched when it came into existence. (effectively, a critical hit.)
   For example: A Graviton bomb makes a critical hit on a Ikazuchi class command carrier. The carrier is totally annihilated! All of its 20 million tons of mass are sucked into the black hole in a flash of radiation. The spatial distortion grows from a maximum radius of 40 miles to a radius of (square root of 20 = 4.47 x 40 miles) 179 miles. A Cheetah class Missile corvette was 60 miles away from the Ikazuchi when it was sucked into the black hole. Originally safe from the disturbance, the expansion means that it is suddenly caught in the disruption. It undergoes 3D6 x 6 % damage (lets say 110 %) of its main body. This is 3200 X 110 % = 3520 MDC. It has been in some fighting, and its shields are at only 1500 MDC. The Cheetah receives 3520 - 1500 = 2020 MDC damage to its main body. This is 67 % (2020 / 3000 x100%) damage of the whole, and all the rest of the hit locations have 67% of their ORIGINAL MDC deducted from their stats. As it is, the Cheetah barely survives, as it has only 2400 MDC left after the fight. When the disruption dies out the Cheetah has sustained 2020 MDC damage to its main body. It is left with only 380 MDC, no shields, and is almost a wreck.

Guidance: Guidance of the weapon is as for standard cruise missiles, and it has the same bonuses/penalties to hit. It follows all other rules for cruise missiles.

By Mischa (mischa.campen@tip.nl)
Minor rivisions by Kitsune (Kitsune@vabch.com).

Pepper Box Cruise Missile Launching System:

There are three variation on this system. These are the Tactical Support Version, the Tactical Bombardment Version, and the Strategic Bombardment Version. All three are designed to be as expendable and as inexpensive as possible. The original designers of the tactical support version were a starship captain and her chief engineer. The captain was Commander Terry Cindy Mayfair, who was then the commanding officer of HMS Wolfhound. The Engineer was Insall Tvek who is a Machine Person refugee who joined New Coventry's Navy. The tactical and strategic bombardment version were later designed by the New Coventry Bureau of Shipbuilding as systems to take advantage of the basic design. The system is a long box with four hatches at on end with the engines at the other end. The strategic bombardment version has a larger engine and has a attachment on the top that the fire control systems are mounted on. All three systems will normally launch all cruise missiles at the same time. The system gets it name from the similarity it has to the four shot derringers which were also called pepper boxes

The Tactical Support versions purpose is to increase the cruise missile launching ability of a starship in the same way that Squires in Macross II increase the beam weapons of a starfighter. They were the first of the pepper box systems developed by New Coventry. Although they are listed here as starships, these systems are an unmanned drone that relies on the fire control of the starship that is using then and the tactical support cruise missile launcher does not have any sensors themselves. Because they rely on the fire control of the ship that they are tied to, the fire control of that ship limits the number that can be used effectively. A general rule is that a frigate or destroyer can control up to 4, a light cruiser can control up to 12, a heavy cruiser can control 16, a battlecruiser can control up to 32, a battleship can control up to 48, and a dreadnought can control up to 96 launchers. Unless the ship is going to use the launcher immediately, the launchers are physically attached to the hull of the starship. This allows them to be protected by the shields of the starship that is controlling them. The launchers normally detach just before they are used. In order to utilize the fire control of the starship that is controlling the launchers, the launchers need to be within 1,000 miles (1,610 km) of that ship.

The Tactical Bombardment versions purpose is to attack starships within your star system either effectively acting as mines or sent to a target to soften the target previous to the starship attacks. Unlike the tactical support versions, they have internal fire control systems and they have navigational shielding but can be used as support launchers if desired.. Depending on the commands wishes, the missiles can be launched at a variety of ranges including so that missile will travel to the target with their drive dead so that they are harder to attack.

The Strategic Bombardment versions purpose is to be able to launch cruise missiles at targets that are in star systems away from your starships. They are basically small unmanned starships with contra-grav FTL propulsion systems. Unlike the tactical support version, they have internal fire control systems and they have navigational shielding. The normal tactic is to launch these missiles from a nearby star system or from deep space nearby and target missiles for starships, space stations, or surface installations. They retain all the abilities of the tactical bombardment launchers

The reason why launchers are normally used from a relatively close star system to the one that they are deployed against is so missile have more accurate information, to minimize the time the target has to detect and intercept the launchers, and finally so star ship forces can arrive just after the damage the missile launchers created. The FTL signature of the launchers can be detected by Gravitic sensors as well. <

These launcher designs uses modified starship speed and ranges. See Revised Starship Rules for Phase World for more details.

Model Types:

NCCM-01-TSL
NCCM-02-TBL
NCCM-03-SBL

Vehicle Types:

Tactical Support Cruise Missile Launcher
Tactical Bombardment Cruise Missile Launcher
Strategic Bombardment Cruise Missile Launcher

Crew: None, Unmanned

M.D.C By Location:

[1] Main Body:	800
Cruise Missile Launchers (4):	100
FTL Engines (NCCM-03-SBL only):	300

Notes:
[1] Depleting the MDC of the main body will put the launcher out of commission. Launcher has a self destruct system to prevent capture. It does 2D4x100 MDC to all targets within 50 feet (15 meters)

Speed:
Driving on the Ground: Not Possible.
Sublight: Has a special sublight engine that allows the launchers to travel up to 99 percent of the speed of light theoretically, but normally limit their speed because of several factors. All three launchers can accelerate/decelerate at the rate of 1.2 percent of light per melee.
The *NCCM-01-TSL* normally limits is speed to that of the ship carrying it because the launcher is virtually useless if outside of the range it can use the fire control of the ship that is using them. The launchers also do not have independent radiation and particle shielding so outside of the shielding of the ship that is using them for support they have a 1% chance of failure if moving faster than 20 percent of the speed of light.
The *NCCM-02-TBL* carries the radiation and particle shielding of a starfighter and can travel up to 40% of the speed of light without having failures from radiation. If the launcher travels over 40% of the speed of light, the launcher has a 1% chance of a failure. These failures are considered acceptable because the launcher is not manned so often they will travel at high sublight speed towards their target.
The *NCCM-03-SBL* carries the radiation and particle shielding of a starfighter and can travel up to 40% of the speed of light without having failures from radiation. If the launcher travels over 40% of the speed of light, the launcher has a 1% chance of a failure. These failures are considered acceptable because the launcher is not manned so often they will travel at high sublight speed towards their target.
Stardrive: The *NCCM-03-SBL* uses a Gravitonic Drive system that allows the launcher to reach a maximum of four lightyears per hour.
Atmospheric Propulsion: Maximum speed is Mach 2.5 (1675 mph / 2700 kph), can enter an atmosphere because flight system is by contra grav.
Maximum Range: Effectively Unlimited by Drive system.

Statistical Data:
Length:
42 feet (12.8 meters) for NCCM-01-TSL
42 feet (12.8 meters) for NCCM-02-TBL
48 feet (14.6 meters) for NCCM-03-SBL
Height:
16 feet (4.9 meters) for NCCM-01-TSL
20 feet (6.1 meters) for NCCM-02-TBL
20 feet (6.1 meters) for NCCM-03-SBL
Width: 16 feet (4.9 meters)
Weight:
15 tons empty and 25 tons fully loaded for NCCM-01-TSL
15 tons empty and 25 tons fully loaded for NCCM-02-TBL
20 tons empty and 30 tons fully loaded for NCCM-03-SBL
Power System: Fusion with 2 year life span.
Cargo: None
Market Cost: 25 million credits for the NCCM-01-TSL, 35 Million credits for the NCCM-02-TBL. 50 million credits for NCCM-03-SBL.

WEAPON SYSTEMS:

1. **Cruise Missile Launchers (4):** Because the apparent weapon speed was so slow, missile speed has been modified and increased. Missiles are launched by special launchers. Missile has a top speed of Mach 25 in an atmosphere and in space has an acceleration of 10% of light per turn (far faster than any starship). Since starships will no longer engage at rock throwing distances, whether weapons can be shot down is calculated from the speed of target, launcher, and missile. When drive goes dead, missile will still cruise unless set to self destruct but has very low odds of hitting starships (Great for hitting bases and planets because target does not move and missile when dead at -25% to detect.) Cruise missiles have minuses to hit small targets but are all considered smart missiles.
   Range: Powered missile range is 8000 miles (12,875 km) in an atmosphere and 4,000,000 miles (6,437,376 km/ 21.5 light seconds) in space
   Mega-Damage & Properties: See Phase World Missiles (Anti-Matter does 4D6x100 MDC).
   Rate of fire: One at a time or in volleys of two, three, or four (a ship can control multiple launch systems at the same time).
   Payload: 1 Cruise Missiles each launcher for a total of 4 cruise missiles (no reloads)

By Kitsune (Kitsune@vabch.com).

New Armor, Weapons, and Ammo for Phase World:

Armor:

Skin Suit:

An extremely light weight version of a vacuum suit and gives some limited protection against damage as well. The suit is available for sale virtually anywhere in the Three Galaxies including repressive governments. In many ships, crews will wear these suits to protect themselves against decompression The suit is very thin and can be worn as clothing with no discomfort or can be worn under clothing. The suit can use normal helmets but is fitted with a special clear hood fitted into the collar of the suit that is thrown over the head in case of emergency. The suit also has gloves in a special pocket. The suit will provide 2 hours of breathable atmosphere by recycling the air but can be fitted with standard tanks on the back of the suit to extend the duration. The suit has no sanitary facilities so the duration in the suit under hostile conditions is limited.

M.D.C.:

Main Body: 12
Head: 10
Arms (2): 6
Legs (2): 8

Weight: 4 lbs (2 Kg)
Penalties: Full Mobility, has no penalties to prowl, swim, or gymnastics
Market Cost: 7,500 credits

Weapons:

Bushido Industries Power Katana:

This weapon is a new creation from Bushido Industries and is a smaller version of the power halberd. The weapon uses advanced miniaturization to enable the weapon to be as small as it is. While the weapon is about the same size and looks like a science fiction version of standard Katana, the weapon weighs more than a standard Katana. Due to the extra weight, the weapon is -1 to Strike and parry unless the individual has a strength of 15 or the equivalent supernatural or robotic strength. The weapon is available with highly decorate hilts for extra cost and has quickly become very popular. There was an attempt at designing a Power Wakizashi but so far the design has been unsuccessful.

Weight: 8.5 lbs (3.9 kg).
Mega Damage: 6D6 (Bonuses for Supernatural Strength are applicable) when powered up. 3D6 SDC otherwise
Effective Range: Hand to Hand only
Payload: Powered by 2 long E-Clips for 2 hours of continual use.
Market Cost: 35,000 credits (Standard, decorate versions can cost far more)

C.A.F. HI-300 Infantry Support Laser Rifle:

A powerful weapon that is used in roughly the same role as the M-60 used by the United States. It is larger than the HI-80 rifle is. It used by many militaries within the Three Galaxies. The weapon can fire single shot, three round burst, or can fire fully automatic. Weapon is normally hooked up to a power backpack.

Weight: 18.5 lbs (8.4 kg).
Mega Damage: 6D6+6 per single shot, 2D6x10+20 for a rapid fire three shot burst, or use machine gun burst rules for higher burst setting.
Rate of Fire: Single Shot, Three Round Burst, and Extended Bursts (Use Machine Gun burst rules).
Effective Range: 4,000 feet (1220 meters).
Payload: 15 shots per short E-Clip, 21 shots per long E-Clip, or 210 with a CAF power backpack.
Market Cost: 80,000 credits.

C.A.F. XR-120 Heavy X-Ray Laser Pistol:

A pistol that is slowly replacing the CAF HI-10 Heavy Laser Pistol and looks much like it. Instead of using a high intensity laser beam, it uses a powerful X-Ray laser beam. The main advantage of this is that the weapon is still silent unlike particle beams and plasma weaponry yet does full damage to laser resistant materials and through anti-laser aerosols. The beam is also invisible without special equipment. The pistol can fire in single shot or two round burst. This weapon is only being used to CAF Fleet Personnel and is not being given to Independent Defense Forces. Unlike original X-ray laser weapons, this weapon does not require a nuclear explosion to generate the X-Rays
Weight: 3.5 lbs (1.6 kg)
Mega Damage: 3D6+3 per single shot or 6D6+6 for a rapid fire two shot burst
Rate of Fire: Single Shot or Two Round Burst
Effective Range: 1,000 feet (305 meters)
Payload: 12 shots per short E-Clip or 18 shots per long E-Clip
Black Market Cost: 42,000 credits

C.A.F. XR-250 Combat X-Ray Laser Rifle:

This rifle is entering service in the CAF and is going to replace the HI-80 Combat Laser Rifle over the next few years. It is designed using the same casing as the HI-80. Unlike the HI-80, this weapon is not going to be made available to Independent Defense Forces. Instead of using a high intensity laser beam, it uses a powerful X-Ray laser beam. The beam is not generated by a Nuclear explosion. The main advantage of the weapon is that it inflicts full damage to laser resistant materials and through anti-laser aerosols. The weapon is silent and beam is invisible without the use of special equipment. The weapon retains the three round burst option of the HI-80 but also can fire in long and extended bursts
Weight: 7.8 lbs (3.5 kg)
Mega Damage: 4D6+6 per single shot, 2D4x10+10 for a rapid fire three shot burst, or use burst rules for higher burst setting
Rate of Fire: Single Shot, Three Round Burst, and Extended Bursts (Use Standard Rules)
Effective Range: 2,000 feet (610 meters)
Payload: 24 shots per short E-Clip or 36 shots per long E-Clip
Black Market Cost: 105,000 credits

C.A.F. XR-1050 Infantry Support X-Ray Laser Rifle:

X-Ray Laser version of the HI-300 Infantry Support Laser Rifle and it uses the same casing as the HI-300 as well. It is restricted in the same fashion as other C.A.F. X-Ray laser weaponry are and will not be made available to Independent Defense Forces. Instead of

using the standard high intensity laser beam, it uses a powerful X-Ray laser beam. The beam is not generated by a Nuclear explosion. The main advantage of the weapon is that it inflicts full damage to laser resistant materials and through anti-laser aerosols. The weapon is silent and beam is invisible without the use of special equipment. The weapon can fire single shot, three round burst, or can fire fully automatic. Weapon is normally hooked up to a power backpack.

Weight: 21.3 lbs (9.7 kg)
Mega Damage: 6D6+6 per single shot, 2D6x10+20 for a rapid fire three shot burst, or use machine gun burst rules for higher burst setting
Rate of Fire: Single Shot, Three Round Burst, and Extended Bursts (Use Machine Gun burst rules)
Effective Range: 4,000 feet (1220 meters)
Payload: 12 shots per short E-Clip, 18 shots per long E-Clip, or 180 with a CAF power backpack
Market Cost: 140,000 credits

Naruni NE-2200 Fusion Pistol:

This is one of the most powerful energy weapons ever constructed and is very popular. Fusion weapons are not available on Rifts Earth. The Naruni Fusion Weapons work much like plasma weapons but the material is even hotter. The spell impervious to fire will protect the target from the weapon but the weapon inflicts full damage against heat resistant materials. The gun uses powerful magnetic fields to contain and collapse the plasma until it reaches fusion. It then releases as a powerful bolt of particles. In an atmosphere, the beam travels down a path burned by a low powered laser.

Weight: 5.5 lbs (2.5 kg)
Mega Damage: 6D6+6 per single shot
Rate of Fire: Single Shot only (No bursts)
Effective Range: 800 feet (244 meters)
Payload: 8 shots per short E-Clip or 12 shots per long E-Clip
Black Market Cost: 35,000 credits

Naruni NE-2800 Fusion Rifle:

The Fusion Rifle is based on the frame of the NE-1000 Plasma Ejector Rifle. Fusion weapons are not available on Rifts Earth. The Naruni Fusion Weapons work much like plasma weapons but the material is even hotter. The spell impervious to fire will protect the target from the weapon but the weapon inflicts full damage against heat resistant materials. The gun uses powerful magnetic fields to contain and collapse the plasma until it reaches fusion. It then releases as a powerful bolt of particles. In an atmosphere, the beam travels down a path burned by a low powered laser.

Weight: 21 lbs (9.5 kg)
Mega Damage: 2D4x10+20 per single shot
Rate of Fire: Single Shot only (No bursts)
Effective Range: 2,000 feet (610 meters)
Payload: 20 shots per short E-Clip or 30 shots per long E-Clip
Market Cost: 65,000 credits.

ZI-950 Sniping Rail Gun:

The ZI-950 is the latest development in long range strike capability, its only drawback as a front line unit is its extremely low rate of fire. Payload consists of the magazine for the rounds and a e-pack to power the weapon.
Weight: 54 pounds (24.5 kg)
Mega-Damage: 2D4x10+40
Rate of Fire: Three times per melee, once every 5 seconds.
Maximum Effective Range: 10,500 feet (3200 m)
Payload: 10 shots per mag, 50 charges per e-pack
Market Price: 215,000 credits, +60,000 with the comp-tracker.
Bonuses/Penalties: +2 to strike with scope, +4 to strike with scope and stabilizer rack, + 8 to strike (no wp bonus) using an comp-tracker stand.

Ammo Types

K-Hex

K-Hex TX-5 Ammo:

Many companies on Phase World and in the Three Galaxies make copies of the Triax TX-5 Pistol and the weapon family. Naruni has designed ammo for the weapons that uses their new K-Hex explosive. A few cases of this ammo has found its way to Rifts Earth and are sold by Metalworks Incorporated.
Damage: 5D6 per round
Cost: 500 each round

K-Hex WI-GL Ammo:

While not as common as the copies of the Triax TX-5 Pistol and family, some companies in the Three Galaxies and on Phase World itself make copies of the WI-GL4, WI-GL20, and WI-GL21 grenade launchers. Naruni has created ammo for these weapons as well as for the TX-5 Series. Available is both fragmentation and armor piercing rounds.
Damage: *Fragmentation:* 5D6 with a blast radius of 12 feet (3.6 m) for one round and 4D4x10 with a blast radius of 40 feet (12 m) for a burst of ten rounds. *Armor Piercing:* 1D6x10 with a blast radius of 3 feet (0.9 m) for one round and 4D6x10 with a blast radius of 8 feet (2.4) for a burst of ten rounds
Cost: *Fragmentation:* 600 each round. *Armor Piercing:* 800 each round.

ZI-950 Sniping Rail Gun by Ki-Tarn Zilkia (Zilkia@juno.com).
All others by Kitsune (Kitsune@vabch.com).

Medical treatment in the Three Galaxies:

Anti-Aging Treatments:
These are sometimes called Anti-Gathics and Anti-Gerome treatments. What they do is reduce the aging of the body. Listed are the technological methods, magical methods can completely stop aging.
Anti-Aging treatment are more effective when used from the patients birth, but when used since birth they increase the time the body takes to physical mature. This does not effect mental aging so a person will mature mentally normally except that hormonal changes will happen slightly later. The later effects of aging from old age are slowed down as well.
These treatments are legal on most planets in the Consortium of Civilized Worlds, Splugorth Planets, United Worlds Warlock, Free Worlds League, Phase World, and the Paradise Federation. The Kreegor have made the treatment illegal because they do not want subservient races to be long lived. Some high population planets in some of the major governments have made it illegal to prevent overpopulation. A few governments have also made the treatment illegal for religious reasons. In all cases, the treatments can normally be found on the black market as well but at 10 to 100 times market cost.
The listed rates are for humans. For all other races, the age at which the patient aging rate changes is the equivalent age for that race. Every race requires a different formula except humans and ogres can use the same formula.
Treatment if started as an adult:
Patient will age physically one year for every two actual years.
Treatment if started at birth:
From birth to age twelve and one half, patient will age physically one year for every one and quarter actual years. At age twelve and one half, the patient will be physically ten years old.
From age twelve and one half to age twenty, patient will age physically one year for every one and half actual years. At age twenty, patient will be physically fifteen years old. These also means that patient will normally go through puberty at age sixteen to age twenty.
From age twenty to age thirty, patient will age physically one year for every two actual years. At age thirty, patient will be physically age twenty.
From age thirty on, patient will age physically one year for every three actual years.
Market Cost: 6,000 per year

By Kitsune (Kitsune@vabch.com).

Return

Phase World Missiles:

Index:

Introduction

Missiles that are used in the Three Galaxies are in many ways similar to those used on Rifts Earth and generally follow the same rules but there are important differences. These are that the speeds of missiles are much greater, there are new some new sensors available, and there are some new warhead types. These rules are designed to work with revised starship rules for Phase World.

Missile Ranges, Top Speeds, and Accelerations:

In the Phase World Dimension books, you get the impression that starships lumber towards each other, not firing any weapons until rock throwing ranges (100 miles or less) and then slowly lumber together until 1 to 2 miles is reached before launching missiles. I prefer a much more dynamic starship and missile combat. Missile ranges are vastly increased and missiles now travel and accelerate as well at percentages of the speed of light. Missile fire may now commonly start at ranges greater than 1 million miles. Missiles can be used to hit targets beyond their maximum range because missiles will travel in a straight line one they run out of energy. They are of course effected by gravity wells but that can be calculated for by starship crews. Targets that do not move are ideal for this type of strike. These targets include orbital bases and cities. There is no bonuses or minuses to hit these targets. To hit specific targets, such as an individual building in a city, the missiles are at -8 to strike. To hit a large moving target such as a Large Capital ship (Protector or Dreadnought for example), the missiles are at -16 to strike and unlike most attacks, the pilot can make dodges that no damage will be taken no matter how large the starship is. Targets smaller than about 5 million tons cannot be hit if they can dodge. Missiles are not effected by the maximum speed like starships are because the missiles lifespan after launch is brief enough that radiation and particle damage is not a factor. About 1 % of all missile will not reach their targets because radiation or particles will either cause them to destroy themselves, become inert, or veer off course. Acceleration is effected the same way starship accelerations are effected.

Missiles do not have to accelerate at full speed and may be stepped down in speed. This may be desirable in a situation that you are longing both long range missile and cruise missiles and want both the long range missiles and cruise missiles to get to their target at the same time.

Cruise Missiles:
Missile range is 8000 miles (12,875 km) in an atmosphere and 4,000,000 miles (6,437,376 km/ 21.5 light seconds) in space. Missile has a top speed of Mach 25 in an atmosphere and in space has an acceleration

of 10% of light per turn (far faster than any starship)

Long Range Missiles:
Missile range is 3400 miles (5470 km) in an atmosphere and 1,800,000 miles (2,89700 km/9.7 light seconds) in space. Missile has a top speed of Mach 20 in an atmosphere and in space has an acceleration of 8% of light per turn (far faster than any starship)

Medium Range Missiles:
Missile range is 160 miles (257.5 km) in an atmosphere and 80,000 miles (128,750 km/0.43 light seconds) in space. Missile has a top speed of Mach 15 in an atmosphere and in space has an acceleration of 6% of light per turn (faster than any starship except a fighter exceeding it maximum safe acceleration)

Short Range Missiles:
Missile range is 10 miles (16.1 km) in an atmosphere and 500 miles (804.7 km) in space. Missile has a top speed of Mach 10 in an atmosphere and in space has an acceleration of 4% of light per turn (faster than any starship except if it is exceeding it maximum safe acceleration)

Mini-Missiles:
Missile range is 2 miles (3.2 km) in an atmosphere and 100 miles (161 km) in space. Missile has a top speed of Mach 10 in an atmosphere and in space has an acceleration of 2% of light per turn (slightly faster than any starship except if it is exceeding it maximum safe acceleration)

Micro-Missiles:
These missiles do not have the size to carry the full gravity drive that larger missiles do. This missiles accelerate at twice their listed Mach speed in Gs of acceleration and have the powered range of eight times their atmospheric speed when they are used in space.

Missile Guidance Systems:
The fire control computers on all Phase World starships is assumed to be able to lock onto and fire simultaneously at as many targets as the launcher has available missiles. *Example:* A Mini-Missile launcher on a Warshield Class Cruiser has the ability to launch on up to 8 mini-missiles at one time. This means that the launcher can theoretically lock onto eight targets and launch at all of them at the same time.

In Phase World, all the guidance systems that are available on Rifts Earth are available but there are additional guidance systems available. This is the list of new Guidance Systems available to missiles.

Gravity Sensor:
All targets have a gravitic footprint which allows them to be tracked by gravity sensors. This includes targets that are invisible. The other advantage is that gravity sensors allow the missile to track its target in real time no matter what the distance is because gravity has no delay and is faster than light. A target can often hid under the gravity signature of other targets to trick sensors but ships that are using gravity propulsion are even easier to detect.

Neutrino Homing:
What this missile guidance system does is home on a neutrino signature. Nuclear Fission Engines, Nuclear Fusion Engines, Anti-matter Engines, Fusion Thrusters, Ion Thrusters, Plasma Explosions,

Fusion Explosions, Nuclear Explosions, and Anti-Matter explosions all create neutrinos that can be tracked. Missiles can be set to track on the strongest Neutrino signature or a specific neutrino signature.

Tachyon Beam Rider:
These missiles use a Tachyon beam to hit its target. The advantage is that the beam is FTL meaning that there no appreciable delay in painting the target. Similar to the Rifts Earth Semi Active Laser and Radar homing and sensors can pick up the beam if they are targeted.

Brilliant Missiles:
This is a more advanced version of the smart missile and the missile actually have a limited artificial intelligence guidance system. These missiles guidance systems are expensive and cost twice the normal cost for the smart missile guidance systems. This guidance system is also illegal outside of the military. This missile guidance is capable of breaking through most countermeasures even those that work against normal smart missiles. Like smart missiles, the missiles must have an autonomous guidance system. Brilliant missiles are more capable then smart missiles and have +7 to strike and +6 to dodge and providing that they can catch their target multiple times, they have three attacks per melee until they run out of fuel. Brilliant Missile also separate when launched so they cannot be destroyed as a volley. All brilliant missile automatically have the feature of IFF identification and Loiter capability. This feature can only be added to long range and larger missiles.

All Phase World Missiles Types (Including minis) are available as smart missile.

FTL Capable Missiles:
Star Ships will often carry a small number of cruise missiles that are capable of being used at FTL speeds for limited durations. FTL capable missiles are limited to cruise missiles only although several governments are presently working on a FTL capable long range missile. The missiles give up part of their payload in order to fit in the FTL propulsion system. FTL combat is in many ways more deadly then sublight combat due to the fact that there are few point defense weaponry that can be used at FTL speeds. Tachyon and Gravity based beam weapons are the only non missile weapons that can be used at FTL speeds so point defense is greatly restricted. In a similar way, the only missiles that is normally useful for defense are missile with Gravity based warheads. The gravity based cruise missiles can be used to pull incoming cruise missiles out of FTL travel. A ship can non FTL capable missiles at FTL speeds but they will only have a little maneuverability and will drop in speed at the rate of 2 ly/hr per turn until then enter normal space. The ship launches these missiles to the front by firing them and then immediately decelerating. Shields are often the best defense against FTL capable cruise missiles. Normally a Starship will carry about 10% of its total missile compliment is FTL cruise missiles. The FTL missiles are very expensive and cost 4 times that of a conventional Phase World cruise missile.

FTL Missile Range and Speed:
The FTL Cruise Missile has a amount of fuel which is given as 50 Fuel Points. At Sublight and a speed of 1 LY per hour it burns 1 Fuel Point per turn, giving it a powered range of fifty turns. For each additional LY/hour of speed it burns one additional Fuel Point per turn, so that at 5 LY/hour it burns 5 Fuel Points per turn, giving it a powered range of 10 turns. At maximum FTL speed of 10 LY/hour it burns 10 Fuel Points per turn, giving it a powered range of only 5 turns. When the CM runs out of fuel it decelerates at a rate of 2 LY/hour per turn, until it finally hits light speed, at which time it continues to go on at 98% of the speed of light. Off Course it can no longer maneuver when its fuel runs out, so from that

moment on it is traveling in a straight line until it is destroyed or it self-destructs. The missiles can be used at sublight speeds as normal cruise missiles but due to the hideous cost of the missiles, this is not normally done.

FTL Missile Warheads:
Some missile warheads are more effective at FTL speeds than others. This is simply because energy usually travels at the speed of light or faster. Conventional explosives, including K-Hex and Plasma Warheads inflict half damage to the front, quarter damage to the sides, and no damage to the rear of the target. Nuclear, anti matter, fusion explosives along with X-ray laser warheads (if very close) will inflict full damage to the front, half damage to the sides, and no damage to the rear of the target. The problem with X-Ray laser warheads is that the missile is to large to carry on FTL capable missiles. The only exceptions to reduced damage at FTL speeds are gravity warheads and Tachyon based warheads which inflict full damage due to the fact that the blast travels at FTL speeds. The space for the warhead in FTL missiles, due to the size of the missiles drives, are smaller than they are in standard missiles and are limited to the smaller sizes of missile warheads. Fusion and Nuclear warheads are limited to Heavy Warheads (Inflicts 2D4x100), Anti-Matter is limited to Heavy Warheads (Inflicts 3D6x100), and all other warheads are similarly restricted.

Missile Warheads:

All warheads from Rifts Earth are available. Go to Revised bomb and missile table (Link to Section 7) for Rifts Earth Warheads.

Nuclear:
In Space, Nuclear Missile do not have the blast that they do in the atmosphere. In space, they do the same damage as fusion warheads on the Revised Missile Tables.

Anti-Matter:
Anti-matter in an incredibly powerful munition that uses a reaction between matter and anti-matter to produce an incredible reaction that does large amounts of damage to the target. The anti-matter is kept in a magnetic containment until it strikes the target and releases its anti-matter. This warhead is only available in Cruise Missiles. If Anti-Matter munitions are used in an atmosphere, they have double the blast radius as a nuclear munition of the same size. The drawback of anti-matter is that it does minimal damage to targets that are impervious to energy. The other limitation is that if a ship with anti-matter warheads takes a magazine hit, it creates powerful explosions that can destroy the ship.

Warhead	Mega-Damage	Blast Radius	M.D.C.
[1] Anti-Matter Cruise Missile (medium)	2D6x100	80 ft (24.4 m)	45
[1] Anti-Matter Cruise Missile (Heavy)	3D6x100	100 ft (30.3 m)	45
Anti-Matter Cruise Missile (X-Heavy)	4D6x100	120 ft (36.4 m)	45
Anti-Matter Cruise Multi-Warhead	5D6x100	150 ft (45.5 m)	45

[1] Warheads that can be carried in FTL Cruise missiles

K-Hex:
K-Hex is a special explosive that only recently has been made useable by weapon systems. In its natural state, it is very unstable and dangerous. In order to keep K-Hex rounds more powerful than standard warheads, their damages have been modified to be above other types of warheads.

Warhead	Mega-Damage	Blast Radius	M.D.C.
K-Hex High Explosive Mini-Missile	1D6x10	5 ft (1.5 m)	1
K-Hex Fragmentation Mini-Missile	1D6x10	20 ft (6.1 m)	1
K-Hex Armor Piercing Mini-Missile	2D4x10	3 ft (0.9 m)	2
K-Hex High Explosive Short Range Missile	2D6x10	20 ft (6.1 m)	5
K-Hex Fragmentation Short Range Missile	2D6x10	30 ft (9.1 m)	5
K-Hex Armor Piercing Short Range Missile	3D6x10	5 ft (1.5 m)	5
K-Hex High Explosive Medium Range Missile	4D6x10	30 ft (9.1 m)	10
K-Hex Fragmentation Medium Range Missile	6D4x10	60 ft (18.2 m)	10
K-Hex Armor Piercing Medium Range Missile	4D6x10	20 ft (6.1 m)	10
K-Hex High Explosives Long Range Missile	6D6x10	50 ft (15.2 m)	20
K-Hex Fragmentation Long Range Missile	6D4x10	100 ft (30.5 m)	20
K-Hex Armor Piercing Long Range Missile	5D6x10	30 ft (9.1 m)	20

Gravity Well Cruise Missile:
This warhead is also to large to be carried on any missile smaller than a cruise missile. Most of these warheads have two settings but some are constructed with one setting to reduce cost of the missiles. The first is that the warhead forms briefly a gravity effect similar to that of a black hole but much weaker. This missile has two special advantages when compared to other cruise missile warheads. The first is that because it does it damage by crushing, a physical effect, it does full damage to targets that are impervious to energy and cosmic knight. The other spacial advantage is that it can temporarily prevent starships from going FTL. It takes one gravity well cruise missile per 10 thousand tons of ship to prevent the ship from being able to go to FTL. A Warshield cruiser, for example, would take 10 gravity well cruise missiles to prevent if from going FTL. This effect only lasts for one melee (15 seconds). If there are not enough gravity wells to prevent the ship from going FTL, The ship takes double damage from ripping through the gravity wells.
The second is only for effecting FTL travel. It does this by producing a weaker but much wider gravity

field. This warhead effects a 1,200 foot radius and effects 100 thousands of ton of ship to prevent the ship from being able to go to FTL. It will also pull the same amount of mass out of FTL. A ship takes about ten minutes to reset its systems before re-entering FTL. The way that the missile warheads are used against ships in FTL is that the missiles are used as mines in the path of the incoming ships. They are activated as the ship passes through the spot in question and have to be carefully planned as a ship passing through the area in FTL goes through if used at below relativistic speeds.

Warhead	Mega-Damage	Blast Radius	M.D.C.
[1] Gravity Well Cruise Missile (Heavy - Setting 1)	3D4x100	100 ft (30.3 m)	45
[1] Gravity Well Cruise Missile (Heavy - Setting 2)	None	1000 ft (303 m)	
Gravity Well Cruise Missile (X-Heavy - Setting 1)	4D4x100	120 ft (36.4 m)	45
Gravity Well Cruise Missile (X-Heavy - Setting 2)	None	1200 ft (364 m)	

[1] Warheads that can be carried in FTL Cruise missiles

X-Ray Laser Cruise Missile Warheads:
This missile is a Fusion warhead that detonates and powers a burst of Laser beams. While the beams have no bonuses to hit other than those from the starship size chart, there is a fairly large number of beams and because of the beams allows the missile to standoff the target. The missile also has on other advantage, when missile goes dead, it has half the normal bonuses and minuses to strike. This warhead is to big too be carried on an missile smaller than a Cruise Missile and are too large to be carried on an FTL capable missile.

Warhead	Mega-Damage	Blast Radius	M.D.C.
Fusion warhead (Direct Blast)	1D6x100	80 ft (24.4 m)	45
[1] X-Ray Lasers (10 beams)	2D4x100 Each	N.A.	

[1] When the warhead detonates, ten X-Ray Laser Beams are fired at the moment of its destruction. Laser Beams have a range of 4 miles (6.4 km) in an atmosphere and 40 miles (64 km) in space. X-Ray lasers do full damage against laser resistant materials. Because the laser do not have a large amount of fire control, each laser has no bonuses to strike and each laser strike should be rolled separately. With large volleys of missile, grouping the rolls may be the only way to speed up strikes but the number of lasers that should be grouped together should be fairly small.

Tachyon Beam Missile Warheads:
These weapons are in many ways similar to the X-Ray laser warheads but is less powerful and far more expensive (around ten times). The weapon is powered by a very powerful fusion explosion. The

explosion powers a series of Tachyon Beam Generators that fire towards the target. The missile fires a total of eight beams and each beam is less powerful than the X-Ray laser beams. While the beams have no bonuses to hit other than those from the starship size chart, there is a fairly large number of beams and because of the beams allows the missile to standoff the target. The missile also has on other advantage, when missile goes dead, it has half the normal bonuses and minuses to strike. This warhead is to big too be carried on an missile smaller than a Cruise Missile but is small enough to be carries on FTL Capable Cruise Missiles

Warhead	**Mega-Damage**	**Blast Radius**	**M.D.C.**
Fusion warhead (Direct Blast)	1D6x100	80 ft (24.4 m)	45
[1] Tachyon Beams (8 Beams)	1D4x100 Each	N.A.	

[1] When the warhead detonates, eight Tachyon Beams are fired at the moment of its destruction. Tachyon Beams have a range of 4 miles (6.4 km) in an atmosphere and 40 miles (64 km) in space. Because the Tachyon Beams do not have a large amount of fire control, each beam has no bonuses to strike and each beam strike should be rolled separately. With large volleys of missile, grouping the rolls may be the only way to speed up strikes but the number of lasers that should be grouped together should be fairly small. Tachyon Beam Cruise missiles are available on FTL capable missiles

Decoy:
Special missiles of various sizes with no warhead but has special equipment to emulate engine and sensor signature of various starships, starfighters, missiles, and even power armors in some cases. Can emulate CG Drive Engines and any other Three Galaxies or Three World Engine. Decoys are not constructed any smaller than medium range missiles. In normal use, sensor operators must roll against the decoy with a -40% or be unsure if the decoy is a real target or not unless there is something that reveals that the missile is not the true target. As well, sensor operators must roll for every decoy, it is not one roll and they know all the decoys are fake. If the true targets and decoys are made to cross paths, the sensor operator must roll again to see if they detect which target is the decoy and which one is the ship.
Medium Range Missile Decoys can emulate various ship sized from cruise missile / power armor to medium fighter sized ship.
Long Range Missile Decoys can emulate various ship sized from cruise missile / power armor to destroyer sized ship.
Cruise Missile Decoys can emulate various ship sized from fighter to battleship size. Ships larger than Battleships cannot use standard missile decoys
Can be used to decoy missiles and normal has about 50% chance of decoying missiles coming after the target using the decoys. While decoy missiles have the same duration as a normal cruise missile, they can continue to operate their decoy systems after the engines have run out fuel and are traveling on a ballistic course. Decoys are available as Cruise FTL capable missiles.
Self Destruct Package inflicts 1D6x10 MDC on medium range missiles, 2D4x10 MDC on long range missiles, and 2D6x10 MDC on cruise missiles and all sensitive equipment will be destroyed.

Jamming Warhead:
Special missiles with jamming equipment replacing the warhead. While the jamming system is on, conventional radar, gravity-wave sensors, and missile guidance systems will not be able to function properly in the area affected. The jamming also effects many communication systems. Sensor systems

will have ranges reduced to 25% of normal and have a -40% penalty to all read sensory roll including the chance of detecting any targets in the area (this includes the missile carrying the jamming system) of the jamming. Smart and Brilliant Missiles can be programmed to go after the signature of the Jamming with a weapon systems roll and smart and brilliant missiles have this option automatically available. Rifts Earth Tech level sensors cannot overcome phase world jamming devices.
Medium Range Missile: The jamming will affect a 1 mile (1.6 km) area in an atmosphere and 100 miles (160 km) in space.
Long Range Missile: The jamming will affect a 5 mile (8 km) area in an atmosphere and 500 miles (800 km) in space.
Cruise Missile: The jamming will affect a 10 mile (16 km) area in an atmosphere and 1,000 miles (1,600 km) in space.
While Jamming missiles have the same duration as a normal missile, they can continue to operate their Jamming systems after the engines have run out fuel and are traveling on a ballistic course. Jamming Warheads are available as Cruise FTL capable missiles.
Self Destruct Package inflicts 1D6x10 MDC on medium range missiles, 2D4x10 MDC on long range missiles, and 2D6x10 MDC on cruise missiles and all sensitive equipment will be destroyed.

Sensor Probe Warhead:
Special Cruise missiles with sensors replacing the warhead. The sensors are equal to those carried on a light star fighter. While Probe missiles have the same duration as a normal cruise missile, they can continue to operate their Probe systems after the engines have run out fuel and are traveling on a ballistic course. Probe warheads are available on FTL Capable Missiles.
Self Destruct Package inflicts 2D6x10 MDC and all sensitive equipment will be destroyed.

By Kitsune (Kitsune@vabch.com).

I would like to recognize Chris Curtis and Mischa Campen for helping with many of the ideas listed here

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Phase World Mines:

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Introduction:

Space mines are basically unmanned platforms that are positioned in planetary orbit, positioned around space platforms, or on courses that a starship would have to go in order to get to a location. In Phase World, there are multiple different general types of mines. They can be broken down into three basic different types. First is simple mines. Second are basically energy weapon platforms. Last are missile launching platforms. Each have advantages and special capabilities.
These sytems are designed to work with my revised starship speeds and weapon ranges. See Revised Starship Rules for Phase World for more details.

Simple Mines:

These are basically a space borne equivalent to the modern land mine or ocean mine. Unlike on the ground or in an ocean, the areas involved are huge. This means that these mines must have some ability for movement although because they do not have to chase just intercept, their speed and range are very limited compared to missiles. The way these mines are used is that when a target gets within the range that these mines can reach their targets, they activate small contra-grav engines and move on an intercept course with the target. A mine can store 800 different targets. Starships and Star fighters can carry these mines in place of the equivalent missile type to lay these mines.

Weight: Approximately the same as a missile of the same size.
Combat Bonuses: The mines themselves are consider smart style guidance and are normally +5 to strike
Warhead: Use the warheads for Phase World missiles, from mini-missiles to cruise missiles. Warheads can include K-Hex warhead, anti-matter warheads, X-ray laser warheads, gravity well warheads, or any other type of warhead.
Speed: accelerates 0.5% of light per turn in space. Mines cannot be used in an atmosphere.
Range: *Mini-Mines:* 50 miles (80.4 km). *Light Mines (Short Range Missile Warheads):* 200 miles (322 km). *Medium Mines (Medium Range Missile Warheads):* 800 miles (1287.5 km). *Heavy Mines (Long Range Missile Warheads):* 2000 miles (3220 km). *Extra Heavy Mines (Cruise Missile Warheads):* 8000 miles (12875 km).
Cost: 80% of the cost of a Missile of the same size.

Energy Platforms:

These platforms are basically ship mounted energy weapons, power supply, and fire control systems that are in a self contained unmanned platforms. They vary in size from small anti star fighter platforms to large anti capital ship platforms. Commonly, if these types of mines are used, smaller platforms will be

mixed with the larger platforms to stop fighters from destroying the larger systems. The normal rate is four anti-starfighter platforms for every one anti-capital ship platform. Some platforms can mix different types of energy weapons on the same platform or be multi barreled but this is uncommon. These mines can store up to 2000 different targets. These systems do not include the X-Ray laser type that destroy themselves when used. For mines with built in stealth systems, cost is 150% of the cost of non stealth versions. These platforms are carried on warships and cargo ships in their cargo holds and are carried by special minelayers.

HI-Laser Cannon (Light):
Weight: 1 tons (1D4x10), 1.5 tons (1D6x10), 2 tons (2D4x10), 2.5 tons (2D6x10).
Combat Bonuses: +3 to Strike (does not have minuses to hit star fighters).
Mega Damage: 1D4x10, 1D6x10, 2D4x10, or 2D6x10 each
Rate of Fire: Four per melee
Range: 300 miles (480 km) in space.
Payload: Effectively Unlimited.
Cost: 4 million credits (1D4x10), 6 million credits (1D6x10), 8 million credits (2D6x10), and 10 million (2D6x10)

HI-Laser Cannons (Medium):
Weight: 4 tons (1D4x100), 5 tons (1D6x100), 6 tons (2D4x100), and 8 tons (2D6x100)
Combat Bonuses: +3 to Strike (use standard minuses to hit star fighters and small targets).
Mega Damage: 1D4x100, 1D6x100, 2D4x100, or 2D6x100 each
Rate of Fire: Two per melee
Range: 16,000 miles (25,000 km) in space.
Payload: Effectively Unlimited.
Cost: 30 million credits (1D4x100), 50 million credits (1D6x100), 60 million credits (2D4x100), and 80 million credits (2D6x100)

HI-Laser Cannons (Heavy):
Weight: 12 tons (1D4x1000) and 16 tons (1D6x1000)
Combat Bonuses: +3 to Strike (use standard minuses to hit star fighters and small targets).
Mega Damage: 1D4x1000 or 1D6x1000 each
Rate of Fire: Two per melee
Range: 100,000 miles (160,000 km) in space.
Payload: Effectively Unlimited.
Cost: 200 million credits (1D4x1000) and 240 million credits (1D6x1000)

Particle Beam (Light):
Weight: 1 tons (1D4x10), 1.5 tons (1D6x10), and 2 tons (2D6x10)
Combat Bonuses: +3 to Strike (does not have minuses to hit star fighters).
Mega Damage: 1D4x10, 1D6x10, or 2D6x10 each
Rate of Fire: Four per melee
Range: 400 miles (640 km) in space.
Payload: Effectively Unlimited
Cost: 4 million credits (1D4x10), 6 million credits (1D6x10), and 8 million (2D6x10)

Particle Beam (Medium):
Weight: 5 tons (1D4x100) and 8 tons (2D4x100)
Combat Bonuses: +3 to Strike (use standard minuses to hit star fighters and small targets).

Mega Damage: 1D4x100 or 2D4x100 each
Rate of Fire: Three per melee
Range: 10,000 miles (16,000 km) in space.
Payload: Effectively Unlimited.
Cost: 50 million credits (1D4x100) and 65 million credits (2D4x100)

Particle Beam (Heavy):
Weight: 10 tons (3D6x100), 15 tons (1D4x1000), and 20 tons (1D6x1000)
Combat Bonuses: +3 to Strike (use standard minuses to hit star fighters and small targets).
Mega Damage: 3D6x100, 1D4x1000 or 1D6x1000 each
Rate of Fire: Three per melee
Range: 70,000 miles (112,000 km) in space.
Payload: Effectively Unlimited.
Cost: 150 million credits (3D6x100), 180 million credits (1D4x1000), and 210 million credits (1D6x1000)

Missile Launching Platforms:

These platforms are basically simply missile launchers with fire control systems. They are more expensive than simple mines but have a much longer range then the simple mines do and so can be used to cover much larger areas. They cannot saturate small areas as effectively as simple mines can. Payload and rate of fire are average for systems. Commonly, if these types of mines are used, smaller platforms will be mixed with the larger platforms to stop fighters from destroying the larger systems. The normal rate is four anti-starfighter platforms for every one anti-capital ship platform. They can be larger or smaller in size. Some platforms can mix different types of missile weapons and can even mix both missile launchers and energy weapons on the same platform although both are less common than single type launchers. For mines with built in stealth systems, cost is 150% of the cost of non stealth versions. These platforms are carried on warships and cargo ships in their cargo holds and are carried by special minelayers.

Mini-Missile Launching Mines: In space mini-missiles have an acceleration of 2% of light per turn (slightly faster than any starship except if it is exceeding it maximum safe acceleration)
Weight: 4 tons
Combat Bonuses: +3 to strike for guided missiles and +5 to strike for smart missile.
Mega Damage: As per phase missile type (Mini-Missiles)
Rate of Fire: One at a time or in volleys of 2, 4, 8, 16, or 36 (all). Missile launcher can fire up to four (4) times per melee.
Range: 100 miles (161 km) in space.
Payload: 36 Mini-Missiles
Cost: 5 million credits

Short Range Missiles Launching Mines: In space short range missiles have an acceleration of 4% of light per turn (faster than any starship except if it is exceeding it maximum safe acceleration)
Weight: 8 tons
Combat Bonuses: +3 to strike for guided missiles and +5 to strike for smart missile.
Mega Damage: As per phase missile type (Short Range Missiles)
Rate of Fire: One at a time or in volleys of 2, 4, 8, 12, or 25 (all). Missile launcher can fire up to

four (4) times per melee.
Range: 500 miles (804.7 km) in space.
Payload: 25 Short Range Missiles
Cost: 10 million credits

Medium Range Missile Launching Mines: In space medium range missiles have an acceleration of 6% of light per turn (faster than any starship except a fighter exceeding it maximum safe acceleration)
Weight: 12 tons
Combat Bonuses: +3 to strike for guided missiles and +5 to strike for smart missile.
Mega Damage: As per phase missile type (Medium Range Missiles)
Rate of Fire: One at a time or in volleys of 2, 4, 8, or 16 (all). Missile launcher can fire up to four (4) times per melee.
Range: 80,000 miles (128,750 km/0.43 light seconds) in space.
Payload: 16 Medium Range Missiles
Cost: 12 million credits

Long Range Missile Launching Mines: In space long range missiles have an acceleration of 8% of light per turn (far faster than any starship)
Weight: 18 tons
Combat Bonuses: +3 to strike for guided missiles and +5 to strike for smart missile.
Mega Damage: As per phase missile type (Long Range Missiles)
Rate of Fire: One at a time or in volleys of 2, 4, or 9 (all). Missile launcher can fire up to four (4) times per melee.
Range: 1,800,000 miles (2,89700 km/9.7 light seconds) in space.
Payload: 9 Long Range Missiles
Cost: 15 million credits

Cruise Missile Launching Mines: In space cruise missiles has an acceleration of 10% of light per turn (far faster than any starship). These missiles do have minuses to hit small targets.
Weight: 22 tons
Combat Bonuses: +3 to strike for guided missiles and +5 to strike for smart missile.
Mega Damage: As per phase missile type (Cruise Missiles)
Rate of Fire: One at a time or in volleys of 2 or 4 (all). Missile launcher can fire up to four (4) times per melee.
Range: 4,000,000 miles (6,437,376 km/ 21.5 light seconds) in space.
Payload: 4 Cruise Missiles
Cost: 20 million credits

Minesweeping:

Minesweeping in the Three Galaxies is normally done by special ships. Minesweepers are normally equipped with very high powered short range (4 million miles) radar and neutrino sensors. Mine sweeper are usually armed with very powerful point defense systems, medium range missile launchers, and long range missile launchers. Missile launchers are uses so ship can destroy mines at the longest distances possible with the best accuracy. It is normally impossible for mine sweepers to be able to eliminate cruise missile launchers before getting into range so powerfull point defense is mounted on minesweepers.

Phase World Special Equipment:

Handheld Gravitic Scanner:

The engineers in Three Galaxies have developed equipment that would be considered incredible when compared to equipment created on Rifts Earth. A simple one is the Handheld Gravitic Scanner. It fills the same role as ultrasonic scanning does now and much more. It is useful for detecting hidden objects and compartments, stress cracks, and even invisible targets. The system can even be used for mapping spaces and gives exact dimensions. 48 hours of data can be stored before the system runs out of space. The system can plug into an Holographic Personal Computer and most other computer systems. The system comes in two models. One is the civilian model and a military version. The military version is just tougher than the civilian version but has the same equipment.
Range: 164 feet (50 meters)
Weight: *Civilian:* 2.2 lbs (1 kg), *Military:* 3.3 lbs
M.D.C.: *Civilian:* 10, *Military:* 25
Bonuses: +10% to detect concealment, electrical skills, mechanical skills, and demolitions disposal skills. +5% to medical skills. Allows the detection of invisible targets unless they are invisible against gravitic sensors.
Market Cost: *Civilian:* 10,000 credits , *Military:* 20,000 credits

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Phase World Starship Equipment:

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Target Sizes

Small: These targets include missiles, power armors, star fighters, large starfighter, and runners
Medium: These targets include corvettes, destroyers, and cruisers
Large: These targets include battlecruisers, battleships, carriers, dreadnoughts, and orbital defense stations

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Starship Sensors:

Active Sensors:

These are sensors that are actively emitting radiation, and use the reflection of the radiation against other objects to detect said objects. All active sensor systems have the limitation that the active signal can be detected by another ship.

Radar:

This system that was designed and constructed in the 1930s and is still in service in much more advanced versions in the Rifts Phase World universe. Radar also includes LIDAR (just like RADAR, only instead of radio waves, this system uses Laser light to illuminate and detect objects) and other similar

electromagnetic based sensor systems. These statistics are for top end C.C.W. Military equipment. Trans-Galactic Empire equipment is consider to have about 80% of the range and other groups will have between 50% to 100% of these ranges. These ranges assume that the targets are not using stealth systems. In those cases, ranges are reduced drastically.

Radar has a large limitation. That is that electromagnetic waves only travel at 186282.4 miles (299,729.458 Km) per second in vacuum. This means that the signal takes 161 seconds to be send from the Radar, to the target and from the target to the detector, at 15 million miles. This means that any information you get at longer ranges can be seconds or even minutes out of date.

These ranges are for space use and when used in an atmosphere, radar will have range of 1/1000 of its range in space.

Radar Detection Ranges	Small	Medium	Large
Merchant	100,000 miles	200,000 miles	300,000 miles
Starfighter	500,000 miles	1 million miles	1.5 million miles
Large starfighter	750,000 miles	1.5 million miles	2.5 million miles
Corvette	1.5 million miles	3 million miles	4.5 million miles
Destroyer	2 million miles	4 million miles	6 million miles
Cruiser	2.5 million miles	5 million miles	7.5 million miles
Battleship / Dreadnought	3 million miles	6 million miles	9 million miles
Orbital Defense Stations	5 million miles	10 million iles	15 million miles

TADAR:

TADAR, or "Fast" Radar in spacer slang, functions by throwing out low powered beams of tachyonic particles. When these particles strike a object they are reflected. Still quite expensive and difficult to make, this system is normally only found on top of the line ships from the Consortium, the Human Alliance, and Kreeghor ships. Although some independent forces also carry the system, it is rather rare outside of the aforementioned superpowers. Virtually no pirates carry the system. The main advantage of this system is that detection is virtually instantaneous, unlike RADAR, and that stealth fields are virtually ineffective against the tachyon beam.

The first disadvantage is that the system is relatively short ranged for a FTL system, having less than half the range of a RADAR system. The second disadvantage is that anyone detected by this method who also carries tachyon sensors is immediately aware where the active sensor is *at that moment*! And since the inverse square law is also in effect for tachyon beams, they will be able to detect you at nearly twice the range that you can see them. For these reasons this system is mainly used during combat to get a accurate position of enemy units who know that you are out there anyway, or when a captain has the suspicion that a cloaked enemy unit is nearby.

TADAR Ranges	Small	Medium	Large
Merchant	40,000 miles	80,000 miles	120,000 miles
Starfighter	200,000 miles	400,000 miles	800,000 miles
Large starfighter	300,000 miles	600,000 miles	1 million miles
Corvette	600,000 miles	1.2 million miles	1.8 million miles
Destroyer	800,000 miles	1.6 million miles	2.4 million miles
Cruiser	1 million miles	2 million miles	3 million miles
Battleship / Dreadnought	1.2 million miles	2.4 million miles	3.6 million miles
Orbital Defense Stations	2 million miles	4 million miles	6 million miles

Active system Disadvantages:

The main disadvantage of active sensors is that, due to the inverse square law, the radiation you emit can be seen from twice as far the distance that you can detect something! A observant enemy can thus see you not only before you see him, if the distance is great enough, he can actually see you throwing Radar, Lidar and tachonics particles around without you ever seeing him! Part of this problem can be solved by "pinging", which is throwing off only short but intense pulses of radiation instead of continuously illuminating the entire sky. By giving the "Ping" a specific length and frequency, a ship can ping once or twice, move to a new position and ping again. This makes it far less likely that a enemy will locate the exact location of a ship.

Passive Detectors:

By far the largest category of sensors in use right now, these passive detectors work by detecting emanation from enemy ships. Since a fully functioning ship is a veritable Christmas tree as far as its radiation is concerned, this is easily the best method of detecting other ships.

Even better, the radiation a active ship puts out is not only that of the electromagnetic spectrum, but also that of subatomic particles that are stopped by almost nothing, but even faster than light gravity waves! The biggest disadvantage is that a careful captain can limit the emanation of his ship, and can even use them to fool a enemy into thinking that there are no, or altogether too many ships out there. It is also difficult to scan the entire sky at once, so passive sensors usually have a more narrow field of vision than active sensors.

Electromagnetic Detection Equipment:

Starships are designed with the ability to detect Radar, Laser, Microwave, Radio, and all other electromagnetic frequencies. This can normally be done at 200% of the range of the transmitter. One all signals, the vehicle must be hit by the signal or it will be unable to be detected. This means that a radar cannot be detected on the other side of a planet and tight beam signals such as laser communication can only be detected if the vehicle attempting to detect them in the middle of the beam.

Neutrino Detector:

All fusion, fission and Anti Matter reactors output neutrinos. The detector uses a specialized magnetic field to capture and focus neutrinos into a sensor designed to detect neutrinos. Neutrinos travel at the speed of light for detection but due the sensors being of fairly short range, this is not a serious factor. The system also eliminates neutrinos from the sun although it is impossible to detect a target if the sun is directly in the sensor as well due to the sun overloading the ability of the system to detect neutrinos. The sensor has a 60% chance of being able to be able to differentiate between fusion, antimatter, and fission reactors. The listed ranges are for space use, for atmospheric range, reduce range to 1/10 of space ranges. Most merchant ships do not have neutrino sensors and these listing is for those that carry them.

Neutrino Detection Ranges	Small	Medium	Large
Merchant	1,000 miles	2,000 miles	3,000 miles
Starfighter	5,000 miles	10,000 miles	15,000 miles
Large starfighter	7,500 miles	15,000 miles	25,000 miles
Corvette	15,000 miles	30,000 miles	45,000 miles
Destroyer	20,000 miles	40,000 miles	60,000 miles
Cruiser	25,000 miles	50,000 miles	75,000 miles
Battleship / Dreadnought	30,000 miles	60,000 miles	90,000 miles
Orbital Defense Stations	50,000 miles	10,000 miles	150,000 miles

Gravity Sensors:

This is one of the most important sensor systems on Phase World Star ships but it is normaly detecting the ships drives not the ships actual mass. Many consider this to be simply the most important sensor system. This is for two reasons. First is that sensor range is much greater than radar and second is that there is no delay in detecting objects using gravity sensors. At the same time the passive nature of this system allows one to remain unseen. These ranges are against ships using gravity type propulsion systems and against ships using most types of force fields. Note that this does NOT include Phasefields. The detectors simply measure the disturbances created by any mass or gravitic field. When used against ships that are not using gravity based systems or force fields, the ranges are reduced by 90% so they have about the same range as radar style systems but still retain its other advantages. The system can also be used at very close ranges to be able to make very detailed internal scans. These ranges are for space use and when used in an atmosphere, gravity will have range of 1/1000 of its range in space.

At close ranges (1/1000 maximum range) the sensors can give detailed scans of ships that are not protected by shields. *Note:* Any starship that can move at high sublight accelerations would be using inertial dampening systems, these would be detectable as gravity drive signatures. These include ships such as those used on Star Trek.

Sublight Gravity Detection Ranges	Small	Medium	Large
Merchant	1 million miles	2 million miles	3 million miles
Starfighter	5 million miles	10 million miles	15 million miles
Large starfighter	7.5 million miles	15 million miles	25 million miles
Corvette	15 million miles	30 million miles	45 million miles
Destroyer	20 million miles	40 million miles	60 million miles
Cruiser	25 million miles	50 million miles	75 million miles
Battleship / Dreadnought	30 million miles	60 million miles	90 million miles
Orbital Defense Stations	50 million miles	100 million miles	150 million miles

Sensors can detect the disturbance caused by Contra Grav and Phase Drive systems going at FTL speeds at greatly increased ranges and is virtually impossible for starships to sneak up on a location using FTL drives although stealth systems will allow for the ships to get far closer using Stealth system. *Note:* Star Trek Warp drives cause an unusual signature that would be similar to a Contra Grav FTL system

FTL Gravity Detection Ranges	Small	Medium	Large
Merchant	0.5 light years	0.75 light years	1 light years
Starfighter	1 light year	1.5 light years	2 light years
Large Starfighter	2 light years	3 light years	4 light years
Corvette	3 light years	4.5 light years	6 light years
Destroyer	4 light years	6 light years	8 light years
Cruiser	5 light years	7.5 light years	10 light years
Battleship / Dreadnought	6 light years	8 light years	12 light years
Orbital Defense Stations	10 light years	15 light years	20 light years

Stealth systems:

Generally all military ships will have stealth devices to reduce both their gravitic signature and normal signature. Starship's stealth systems that are not magical in nature work by a variety of principles:

In order to be less visible by electromagnetic waves the ship can be build with a specific shape. This reflects the electromagnetic waves in directions away from the detector. This is a rather old method, which is slowly coming back into vogue. More common nowadays is for the ship to have its shields angled in specific directions to cause electromagnetic waves to bounce at angles not directly back to the transmitting ship. Either of these methods can reduce the range at which a ship is detected to 10% of the normal rating of a sensor. For simplicity`s sake most builders do not make their ship in the specific shape to reflect electromagnetic waves. This because most ships are already equipped with shields, making the specific hull shape redundant.

However, in recent years the TADAR sensor has become more popular (read "cheaper"), and since this form of active sensor almost disregards the low-powered shields used to deflect simple electromagnetic waves, but *is* hindered by giving the ships hull the specifically angled shape, there is a trend towards building ships that do have the Stealth shape. The use of a shield lowers the detection range of a TADAR to 70% of the sensors listed range. The application of a stealthy hull shape lowers the sensors listed range to about 20% of its listed range, and the combined use of the two lowers the sensors range to 10% of normal.

Starships that use contra-grav drives use their shields to conceal the gravity wells produced by the ships engines and have their shields reduced in power. However, for any of this to be really effective, the ship must have well tuned engines, and even then they cannot be run on more than a third of their normal power. If this is done, the ranges at which a ship can be detected with gravity sensors in both Sublight and FTL travel is reduced to 10% of the normal ranges for which the sensors are rated. If either the drives are not properly tuned, or if they are run at more than a third of their power, the range at which they can be detected opens up to 40% of the normal ranges for which the sensors are rated. Finally, the shield slows down neutrinos so that fewer neutrinos are there to be detected.

Jamming system:

Virtually all military star ships and some runners are equipped with jamming equipment. While the jamming system is on, conventional radar, gravity-wave sensors, and missile guidance systems will not be able to function properly in the area affected. The jamming also effects many communication systems. Sensor systems will have ranges reduced to 25% of normal and have a -40% penalty to all read sensory roll including the chance of detecting any targets in the area (this includes the starship carrying the jamming system) of the jamming. Smart and Brilliant Missiles can be programmed to go after the signature of the Jamming with a weapon systems roll and smart and brilliant missiles have this option automatically available. Rifts Earth Tech level sensors cannot overcome phase world jamming devices. Jamming systems have 100. Merchant Jamming systems are military systems and will be the equal of the systems of a military ship of the same size.

Jamming System Ranges	Range:
Merchant	Varies
Starfighter	1,500 miles
Large starfighter	2,000 miles

Corvette	5,000 miles
Destroyer	8,000 miles
Cruiser	12,000 miles
Battleship / Dreadnought	25,000 miles
Orbital Defense Stations	40,000 miles

Communication Systems:

These will be added to the equipment listing when complete. These will be added to the equipment listing when complete. Communication systems include standard radio, laser & Microwave, tachyon, neutrino, and gravity pulse.

Tractor Beams:

There are several kinds of tractor beams. The first is really a offshoot of the contragravity drive that is so common in the three galaxies. Any ship with a contragrav drive has the ability to use that drive as a low powered tractor beam. The amount of mass that can be moved in this way is limited by both the mass of the ship generating the tractor field, AND the power of its engines. br>

The formula to calculate how much mass a starship can tractor is this:

Mass to be tugged = (Ships mass / 100) x Ships maximum acceleration in % of light.

Distance also plays a role in the strength of the tractor field. Apply the factor out of the following formula to the result of the previous formula if the load to be tractored is more than once the ships own length removed from the ship:

Factor = 1 / (D^2)

D = number of ships own lengths the mass is removed from the ship

The second kind of tractor beam is a dedicated piece of equipment. It is a powerful tractorfield generator that is securely mounted into the ships structure. These can have a dedicated rating, such as in the case of specialized tugs, or they can operate in percentages of the ships mass.

In general most ships carry tractor beams that operate in percentages of the ships mass. Each such a tractor beam generator can tractor up to 5 % of the ships mass, and no more than four of these generators can be carried on a ship without the ship needing major reinforcements to its structure.

Again the distance that the mass to be tugged has to the ship is important, but because the generators are purpose build, their focus is much better. For the first 10 km there is no loss of tugging power, after that the tractor beam is again subject to dispersion. This is the formula:

Factor = [1 / (D ^2)

D = Number which is the distance of the mass to the ship in units of 10 km

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Computer Systems:

Fire Control:

Most Starships are designed with fire control to control up to 150% of the amount of weapons of the vehicle but there are some exceptions that can control more than that.. This is designed so if fire control systems are damaged, other systems can take over.

Cybernetic Computer Links:

Most advanced starships in the Three Galaxies have very efficient neural links. The crew members link in using head jacks and they give the following bonuses:

+1 attack, +1 strike, +1 dodge, +2 to initiative, and +10% to piloting skills.

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