Appendix: Galactic Weaponry and Armoring

Plasma Weapons

By far the most popular sidearm technology available in the galaxy, the name itself is slightly inaccurate.

Plasma weapons (most commonly found in pistols and assault arms) don't actually fire balls of plasma directly from the barrel; they have considerably more in common with standard kinetic weapons rather than energy weapons.

Plasma weapons use small cartridges of any varied number of sizes, very similar to the different calibers of bullets found in traditional Earth firearms. The flaming tail of a plasma round isn't matter in a plasma state at all, but a burning tracer on the end of the round to help the shooter guide future shots.

The plasma doesn't come into effect until the cartridge hits its target, where the impact ignites a very small and highly contained tritium fuel supply and reactor catalyst. Due to its small size, the yield is not large, and radiation is near nonexistent; but the burst of heat and concussive force is more than enough to cause serious (if not lethal) harm to exposed organic material, in addition to the damage caused by the cartridge itself. Several focused shots can also generate enough heat to even penetrate highest quality carbide armoring.

In addition to size, plasma cartridges also can be fabricated into different forms to affect the nature of the cartridge. Rounded cartridges cause more surface damage and are useful against lightly armored enemies or to minimize internal damage. Sharper edged rounds penetrate into tissue before igniting the plasma, near ensuring fatal damage. Even more sophisticated cartridge heads are used to penetrate heavy armoring, both personal and vehicular, before igniting the plasma inside. Due to their efficiency, sharp rounds are illegal for civilian use near anywhere in Galactic Alliance space, and are often highly restricted even among the military, mostly reserved for specialists in obvious combat scenarios.

Plasma cartridges are also available for long range sniper class rifles, but are not nearly as common, as it requires careful configuration and expense to ignite the plasma properly, due to the high penetration tendency of such weapons to completely pass through the target. Because of that greater expense with minimal gain in effectiveness, most snipers don't bother, and if they do, it's more to dispose of the round, detonating the plasma long after the kill shot to prevent identification of the round and the rifle it was fired from.

Development of prototype plasma weapons have lately centered on Malleable Point Technology; which involves specially designed sidearms and cartridges that can shape the point of the cartridge in the barrel before firing, allowing the shooter to adjust the shape of the cartridge to adjust to changing scenarios on the battlefield, eliminating the need to carry several different types of ammunition.

Matter Coil Weapons

While weapons for surface combat utilize plasma canisters, such weapons have not translated well into the large scale of spacecraft combat. The thicker hulls and armor of spacecraft are considerably less taxed by plasma eruptions, not to mention that plasma disperses far quicker in space than in atmospheric conditions.

The technology of choice in cannon armament is called matter coil acceleration. The visible cannon is merely the barrel of a much larger mechanism within the craft. In the cannon's core is an acceleration coil, where a mass (usually metal) is superheated to a semisolid state and sped along the rails of the coil to up to one tenth light speed or faster, depending on how long the weapon is charged.

Fighters tend to utilize a quantity over quality approach in this regard, firing quickly with

slower traveling “shells”, although charging faster shots if trying to damage cruisers or overload their shielding. Larger crafts charge for as long as they can to concentrate their fire into heavier shots more capable of penetrating heavily defended craft or positions.

Craft to Craft Missiles

Another option that spacecraft will exercise against fast moving or highly maneuverable targets are missiles. These are actually very similar to the missile weapons used on Earth currently, although considerably refined with far better destructive payload.

They tend to be extremely expensive as they use sub-light drive propulsion equal to fighter starcraft, but make up for that expense with seeking technology that is not as easily fooled by countermeasures that confound shipboard targeting systems. Missiles also overwhelm the light shielding that fighters carry more easily than the rapid fire matter cannon shells necessary to actually hit such a target at all. One missile can do the job of potentially a hundred shots from a cannon, making them useful enough to be carried by most craft in limited numbers.

Cold Fusion Ordinance

Even in a galactic civilization level of advancement, when you want to make a big boom, you go nuclear.

Cold Fusion heavy ordinance became the standard bombing weapons for most galactic cultures even before they made significant strides to leaving their home systems. The centuries of advancement have honed those weapons into the most efficient means to devastate large areas from orbital bombardment.

Unlike the limited fusion technology currently on Earth (which is largely limited to Tritium to Helium fusion), cold fusion technology in the Galactic Alliance has managed to hone the technology into a two stage process that manages to begin the Carbon Cycle of fusion before losing the heat and mass. The end result is a massive release of energy in two distinct detonations that leaves nothing behind but carbon residue.

These weapons often weigh in excess of one hundred thousand kilograms, and there is a significant (if misguided) arms race to develop the largest such weapons. Currently, the heaviest of the heavies in any sense of mass production is the Solarian's “Final Judgment 5”, of the tech line of the same name. It is actually on the “light” side in terms of payload, but its fearsome power isn't just in the fusion fuel alone.

Unlike most that use a simple thruster propulsion to guide the weapon to its target, the Final Judgment 5 is propelled through the entirety of its travel. This creates two separate effects in addition to the Hydrogen to Carbon fusion that occurs within all weapons of its grade.

The actual fusion occurs above ground, like most general fusion ordinance, but before such detonation occurs, the shell (constituting the majority of the weapons mass) ejects the fusion material, and continues at ever increasing velocity into the planet's surface itself. The resulting impact is equivalent to the celestial body impact that created Deep Bay in Canada, in addition to the fusion detonation equivalent to one hundred Tsar Bomba detonations. Other races call it the “Planet Killer”, as simply one of those weapons could render nearly all of North America uninhabitable if it struck.

It is not believed that the Final Judgment 5 has ever been used in a non-test scenario; scholars suspect that the fusion bombardment of Baramak was done with earlier weapons in the Final Judgment line. Nonetheless, Solarian research and development is already at work developing the Final Judgment 6, with greater payload and larger mass.

More tactical neutron and smaller cold fusion ordinance exist, but for such delicate maneuvers,

it is often more cost and manpower efficient to use on the ground strike force teams. However, such smaller ordinance does have some use to knock out critical large scale installations in a first salvo before sending down large scale invasion forces.

Dark Matter

But most frightening, and currently only in the theoretical stages of development, is the next level of heavy weapons, utilizing dark matter. There's little hard design of these weapons at the time of The Second Gate, but what has been done either in simulation or small scale shows the potential for destructive force unseen since perhaps the extra-planar combat of the Archangel Wars.

Dark Matter, as used by the Galactic Alliance, is merely a blanket term to describe several different types of otherwise undetectable matter in the universe. One form of dark matter, called the graviton, is used as the primary means of galactic travel, as it has no mass yet has the gravitational force to create the quantum folds that connect the star systems of the galaxy within the bounds of reasonable travel.

Weaponry would theoretically utilize graviton's polar opposite, a particle with significant mass yet very little (if no) gravitational pull. The different races have different names for this still theoretical state of dark matter, although the Arcadians have claimed to have created small amounts of this "Amalgon" dark matter.

This form of dark matter could literally be of unnatural and immeasurable destructive power. One theoretical weapon the Arcadians have already put into preliminary design is code named "The End", where a warhead of Amalgon would be injected via quantum fold into a system's primary star. The immense increase in mass could theoretically disrupt said primary, causing to age prematurely in very short time, either swallowing up entire planets as it shifted into a giant phase, or causing a runaway fusion process and cause the star to abruptly go supernova. Another "more tactical" application of the weapon would throw a warhead at a planet, disrupting and destroying the body.

The fear of the potential of this class of weapon has lead several elements of the Galactic Alliance to insist that these weapons we heavily monitored and legislated, even as the technology for them is still rudimentary to the point of being nonexistent at best.

Hypersteel

Hypersteel got its name from laymen during the Erani's rise as an interstellar race, due to its dull color and appearance like traditional steel. Despite this label, hypersteel is a carbide (a carbon based amorphous alloy), rather than a standard metal alloy.

It's a much more rigid carbide, which thus makes it unsuitable for items that need a degree of flexibility, but is much more desired for plating of vehicles and as a construction material. It is not hyperbole to say that hypersteel makes interstellar civilization possible.

And yet, hypersteel is probably most recognized in the crafting of melee combat weapons, notably for decorative swords, or even the weapons of station used by Erani Knights. Even though the blades are demonstrative, in capable hands a hypersteel weapon is lethal at close range, as most skilled Knights can prove if so inclined.

Carbide

Carbide, technically, is the label given to a family of amorphous metal alloys that use carbon, or some carbon polymer, at its core to give the resulting alloy any number of properties. They can range anywhere from the easily molded fiberwall to the near indestructible hypersteel.

But in military jargon, carbide tends to refer specifically to combat armoring. The carbide used

for armor, be it plated full body armor used by shock troops or the lighter vitals-only armor used by civilian peacekeepers is usually constructed in three layers.

The undermost layer is a softer, almost spongy alloy designed to absorb direct impact blows, layered then with a hypersteel shell that can even resist the heat generated by plasma rounds. This second layer varies in thickness depending on the armor being fashioned.

Finally, a thin shell often no more than a millimeter thick with the feel of ceramic is added, this topmost layer offers little protection, and is merely aesthetic, as this layer takes to dye very well and allows for a personalized color scheme and pattern.

In the case of full body combat armoring, a hypersteel mesh like chainmail is added to protect the joints and other places that would be difficult for plates to cover. This mesh varies in the size of the links depending on personal preference; larger links offer more mobility, but leave larger gaps for potential attacks to slip through. Most Erani Knights prefer thinner mesh, counting on their psionic defenses to make up for it, while standard shock troops tend to suffer less flexibility in exchange for the better coverage.

Recent developments have yielded advancement in that area specifically, as prototypes are slowly developing a "liquid metal" that would improve upon the protection of those areas normally covered by the mesh. This new flexible carbide is tougher and more readily pliant than mesh, and covers the entirety of the joint, giving the best of both styles of mesh with none of the weaknesses.

Energy Shielding

While a popular means of defense in most science-fiction universes, in the Gate Series universe, energy shields have very limited application with power requirements that make them rather infeasible as primary method of defense.

Energy Shields are reserved entirely for spacecraft; and attempts to make them viable on a personnel level have been met with little success. Prototype combat exoskeletons with small yield energy shielding are in the works by the time of The Second Gate, but are still a couple decades away from being viable technology.

And even on spacecraft, energy shielding is of very limited use. While capable of deflecting matter cannon shots, missiles tend to carry too much sustained mass and travel too slowly to be effectively turned aside, overwhelming the batteries that sustain said shields in short order. And even against matter cannon shells, the batteries don't hold terribly long. Energy Shields really only effectively stop the initial exchange before failing.

The most effective and efficient means of spacecraft defense remains in increasingly stronger armor plating and hulls.