

# A Primer on *Fields of Color*

## *Concerning Details of the Universe*

*In the 57th age of our worlds, human lifespan had grown a thousand-fold. Carried by the winds of our sun, countless cultures spread to the worlds beyond Earth, in what became known as "The Great Diaspora". Hundreds of years later, the work of ten generations was complete, and Great Portals allowed humankind to travel across the stars in the blink of an eye. Now, in this "Age of Reunion", human cultures once separated by many lightyears would begin to collide once again...*

## Relevant Locations

### The Interstellar Commonwealth:

Often just called "The Commonwealth", this political collective exists throughout most of Human-Occupied Space, with the main exception being the territories controlled by the kingdom of Arath-Makah. The Commonwealth is a loosely bound collection of worlds and artificial habitats that coordinate the logistics of resource distribution and citizen movement between the member locales. The logistical, technological, and medical advances developed within the Commonwealth have rendered any sort of conventional political economy invisible, with citizens living an egalitarian lifestyle; they are able to live and work in whatever ways their creativity drives them, with only rare exceptions, e.g. projects conducted on Earth. Commonwealth science is also responsible for the development of the Portals, which link the many worlds and habitats contained within. In fact, the entire structure of the Commonwealth would not be possible without the use of these Portals due to the infeasibility of coordinating supply chains across many hundreds of light-years. Prior to the invention of Portals, the worlds of the Commonwealth existed in much more isolated clusters, often as small as a single star system. The most important Commonwealth locales are listed below:

### Earth:

The birthplace of Humanity, Earth is the only world in Human-occupied Space on which Archaeology can be conducted. For this reason, the entire planet has been designated a "Protected Archaeological Zone": no new settlements may be developed there. As such, the population is much lower than other worlds in the Commonwealth. Most of the people who live there are researchers and historians, with only a small percentage of inhabitants being "native-born". The landscape is littered with ruins of past Human civilizations, from the temples and palaces of the ancient times to the skyscrapers and robots of the later civilizations. History buffs and Archaeologists from all over the Commonwealth dream of a chance to work on Earth, and the very few modern structures on the surface are research facilities housing these travelers.

### Byurimidas:

Often considered one of the Commonwealth's most beautiful natural wonders, the planet Byurimidas is a nearly untouched natural wilderness and wildlife preserve. People live there either in small wilderness monitoring outposts or in much larger floating cites held aloft in the lower atmosphere by hyper-bouyant gas. Due to the unique emission spectrum of the system's star, the planet is bathed in a hue of light slightly more golden then most other main sequence stars of its type would provide, and the world has become a popular tourist destination among those who wish to witness its splendor.

## Béjiir:

Béjiir is one of the many "Ring" habitats located in orbit around uninhabitable worlds in the Commonwealth. The rings make use of spin gravity to create 1 g on their inner surface, so that a habitat may be built there. Béjiir is the most prominent cultural hub of the Commonwealth, and many of the supply chains for its region of space run through the habitat at some point along their journeys, with more than a million ships entering and leaving the ring every day.

## The Kingdom of Arath-Makah:

A binary planetoid system, where two worlds of roughly comparable mass orbit around a shared center of gravity, Arath and Makah are two dry, arid worlds that are just barely habitable by humans under normal circumstances. As such, most of the vegetation that exists in the system are heritage cultivars brought over by the original settlers. Most Arath-Makani cities are built from giant complexes of conservatories which maintain the bulk of the worlds' plant life, as well as all of the humans that live there. Water is sourced from a collection of large underground aquifers that feed the cities which dot the surface of both planets. Because of this, the most important field of science in the kingdom is geology, with expeditions to locate new aquifers heavily supported by the system government.

Arath-Makani society is highly stratified and theocratic, with the royal family in de facto control of both the church and the system government. It is also usually isolationist in practice which, in combination with the aforementioned factors, prevented the kingdom from joining the Commonwealth after its establishment or accepting a Portal to connect it with Commonwealth space. Arath-Makah generally regards the Commonwealth as a meddling and young society who overextend their noses where they don't belong. There is also some resentment due to the fact that the Commonwealth has subsumed Earth within its territories, a fact which comes as a serious insult due to the planet's great importance in the Arath-Makani religion.

For the Commonwealth's part, views of Arath-Makah are diverse. Some view the system as an exotic foreign locale with interesting cultural differences, while others view it as the last vestige of stubborn hierarchs that shut themselves off from the rest of humanity and rule over their subjects. As it stands, political tension exists between the two societies and because of Arath-Makah's refusal to operate a Commonwealth Portal within their space, travel and trade between them is restricted to sub-light transport ships, which take a year at least to reach their destination even from the outermost edge of the intervening territory.

## Üldaimn:

Almost nothing is known about this mysterious region beyond even Arath-Makani space. The original settlers and all subsequent research vessels sent into the region have vanished. It is known that some form of human society exists in this region, but beyond that knowledge and the word "Üldaimn" recovered from a debatably credible radio signal, the region has yielded only silence to the outside.

## Important Technologies:

### Portals:

If any single technology defines the Age of Reunion, it would be the Portals. These are artificial wormholes created by altering the topology of spacetime, which creates a path between two locations other than the standard straight line through "ambient" space. However, transit time through this Portal will always take longer to traverse than simply moving through the ambient space. Because of this, for the longest time, Portals were used mostly for secure communications and as emergency escape routes called "Tethers", used in the event that conventional transport methods or escape routes become inaccessible, e.g. cave-ins or remote crash landings.

It was the advent of faster-than-light Portals, called "Great Portals", that truly changed life in human-occupied space. It was discovered that by clever use of gravity manipulation, the ambient space between two points could be curved towards each other in a higher dimension. So while the distance through ambient space was quite large, distance in the higher-dimensional space was significantly shorter, reducing transit time to mere hours or even minutes in some circumstances. This process is only able to be achieved with sufficiently high mass-energy to warp the space-time, and so is only possible on the large-scale Portals which connect star systems together. Smaller, human scale or microscopic portals are still subject to the constraints of the longer-than-ambient transit time.

A note: Portals cannot be created remotely. The two Portal mouths must be created together and then physically moved to the locations one wishes to connect. As such, the establishment of any links between star systems require first transporting one of the Portal mouths to the desired location at sub-light speeds through the ambient space. Once this is accomplished, however, near instantaneous travel can be accomplished as long as the Portal remains intact.

### Field Circuits:

If Portals define the current age, then field circuits defined the previous. In fact, many of the current political powers have their roots in different cultures' responses to the introduction of this revolutionary technology. A network of superconducting wires is embedded throughout the body via injection. These wires allow for the user to directly manipulate the fundamental force fields of nature. The strength of these fields is controlled by the amount of current flowing through the circuits, and is thus limited by maximum power output. In humans, this power is generated via implanted thermoelectric generators called "demons", which harvest the natural heat generated by the human body to create a DC electrical current. The power output of a demon scales linearly with size, and with only so many demons able

to fit into a single human body before they would siphon too much heat and induce hypothermia, the size constraints of the human body translate into hard limits on power output for human beings.

Any field becomes weaker the further one moves from the source, and field circuits naturally attempt to neutralize any outside field acting on the user's body. This leads to a natural stalemate between any two circuit networks of roughly equivalent size, meaning that no human possesses the ability to kill another human with field circuits. This was, in fact, the original stated purpose of the field circuits from their creator, Dr. Garnt Zominith. He believed that with the entire human race empowered to control the environment around them, but unable to kill one another, a new era of peace would be ushered in. However, there is unfortunately no stalemate between a human and a machine equipped with circuits of significantly greater power, which can be accomplished by any modern energy source as well as allowing circuits of greater effect size.

Nevertheless, field circuits remain an integral part of life for almost everyone in human space. The four types of circuits are described below:

- **Electromagnetic Circuits (Mag Circuits)** control the electromagnetic field and are far and away the most ubiquitously used circuits in everyday life. With long range and high strength per watt, Mag fields are the easiest to manifest and have a multitude of common uses:
  - Often used for self-defense; ionizing atmospheres into plasma beams or induction of direct electrical current.
  - The generation of protective shields against both physical objects like bullets or knives, as well as protection against energy weapons. These also render humans functionally immune to electrocution.
  - Remote manipulation of ferromagnetic materials
  - The generation of light in dark areas.
- **Strong Nuclear and Weak Nuclear Circuits (Nuke and Rad Circuits, respectively)** control the atomic-level forces involved in nuclear reactions and radioactivity. Used almost exclusively for manufacturing on larger scales, humans mostly use these circuits for limited transmuting of elements into one another, due to the short-range and slightly inconvenient strength per watt. The processes involved can produce elements no heavier than iron without beginning to accumulate diminishing returns on energy input, iron being the most stable element. It is possible for these circuits to be used to trigger a nuclear explosion given sufficient fissile materials, though not at ranges long enough for the user to escape the blast. Because of this possibility for abuse, fissile materials are heavily monitored by the Commonwealth logistics systems. While it is technically possible for a human to manufacture their own fissile materials, this would take a great deal of time.
- **Gravity Circuits (Grav Circuits).** While technically a long range force, gravity has such an extremely low strength per watt as to render it prohibitively energy intensive for humans to manipulate. In almost every such case, grav circuits are used to maintain the stability of emergency tethers mentioned in the above section on portals. Despite this, enlarging the mouths of one of these tethers to a size wide enough for a human to fit through would require an external power source or extreme capacitance battery. Once freed from the constraints of human-implantable power supplies, however, gravity manipulation can be used in several applications. Ships with independent fusion reactors are able to significantly reduce their own weight during liftoff and landing inside the gravity fields of planets, making the process significantly safer and less error-prone. Also, the great portals used to connect star systems use just these kinds of circuits,

though notably these portals are almost never “held wide” to their full size unless a ship is actually in transit between systems, lest huge amounts of power be wasted.

## **Medical Bacteria (Medbac):**

The primary medical treatment of first use in the Commonwealth, Medbac is a type of heavily modified bacteria which stimulate rapid healing of human tissues, usually appearing as a white paste. They secrete enzymes which activate cell repair and replication mechanisms within seconds of being applied to a wound or consumed orally. Medbac metabolize glucose, the same cellular fuel used by human cells, so they can operate quite comfortably in the body until their job is done.

Medbac are found everywhere in human-occupied space, both in high-level hospitals where machines can target their application quickly and efficiently, as well as in personal flasks which are maintained by individuals for use in emergency situations. Both methods are perfectly capable of healing the same injuries, but personally maintained colonies take much more time to heal extensive injuries.

Medbac colonies can be cultivated so easily because of their ability to metabolize glucose not just from the human body, but from longer-chain glucose molecules like cellulose found in almost all plants. Personal colonies can be fed by random plant matter found in the environment, leading to a difficulty of maintenance no higher than a sourdough starter. To some extent, Medbac can even take advantage of materials found in the local environment to help carry out the healing process, displaying some limited adaptability.

## **Miscellaneous Entries:**

### **Balam:**

An old Earth word, literally meaning “wind”, the art of Balam is a type of martial art developed in the kingdom of Arath-Makah based on the use of field circuits. The aim of the practice is to use the fields to induce and guide the flow of currents in materials which exist in the user’s surrounding environment. Some basic examples are manipulating water currents by exploiting the polarized molecules within, or creating large air currents by way of electro-acoustic transduction. It is said that skilled practitioners can even induce currents in solid materials, though this is widely considered to be a rumor.

A bastardized version of Balam has spread across much of human-occupied space, even the Commonwealth, but this mostly amounts to ionization of atmospheres to create plasmas for self defense. Outside of the kingdom of its origin, Balam is mostly just a word used for any kind of self-defense by way of field circuits, and the true art and philosophy has mostly been lost in translation.

## **The "Thousand Eyes" Satellite Constellation:**

Most planets in the Commonwealth are orbited by a constellation of satellites which serve three purposes: the establishment of a global comms array, as platforms for publicly accessible space telescopes attached to each satellite, and as a means to image the surface of the orbited world, both for public science and for the detection of fissile material signatures.

## **Shieldsong:**

Human-Occupied Space is currently in a situation of peace, but this was not always the case. In previous ages, great battleships waged war across planetary distances. The primary implements of protection for these ships were shields created by onboard Mag Circuits. Their primary offensive tools were high-power lasers, also created by Mag Circuits. This created a problem: How could the lasers pass through the ship's own shields without letting enemy fire inside as well? The solution was to oscillate the shields at frequencies that would exactly counter-match oscillations in the firing lasers and allow the two field projections to operate simultaneously.

Any simple pattern could be easily deduced by the enemy and accounted for, and random oscillations would create too much interference with the projections, so ships began employing a regiment of "composers" that would alter the patterns of the oscillations on the fly. These so-called "shieldsongs" would come to define a crucial aspect of the battlefields of old, as composers were tasked with anticipating the enemy's shieldsongs, as well as adapting their own to counter similar efforts by their opponents. Many battles in the previous age were decided by crucial, often last-second turns in the balance of these grim symphonies.