

# Miner Wars 2081 Encyclopedia: Chronicles of the 21<sup>st</sup> Century

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*Arthur Higgins (\*2016), Published 2081*

*Work in Progress (Revision 1.90)*

# Introduction

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## The Great Solar Event of 2070

The **Solar Event in 2070** changed the destiny of mankind for many generations to come. Apart of destroying billions of lives, most of the technology and production infrastructure of human civilization, the event also destroyed all planets and moons in our solar system, shattering them into pieces. It has shaken our very foundation and enabled more radical ideas and approaches to future expansion and exploration. Religious fanatics claimed it to be “an unfinished apocalypse”. Humanists and environmentalists pointed to an artificial way of life. But mankind was faltering, and political leaders used the new situation to strengthen their positions. Laws and regulations increased, leveraging more power to the same hands of those who already had it and thereby taking it from the socially weak.

The era before the Solar Event was often called the “**Second Space Race**”, (pointing to new widespread desire of nations, factions and corporations to take part in space colonization, mining operations and space industry) or the “**Second Cold War**” (pointing mainly to the new world division between the two superpowers – EAC and China – and the fellow supporters of one of those two – Russia, OmniCorp, India...).



And then, in 2070, fate brought us into a completely new world.

A world built upon the ashes of our cities, our families and all the living beings on Earth. **Project Genesis** was launched, an experimental project designed by leading world scientists and industrialists as a solution to the increasing energy consumption and to provide the next step in the colonization of the vast universe. After nine years of thorough preparations and financial investments from the wealthy countries and corporations, the project was not only a failure – it nearly brought with it total destruction. The idea was to harness the energy of the sun directly for our own use. However, the experiment resulted in a massive solar disruption, leading to devastating and far-reaching waves of solar flares. More importantly, the experiment resulted in a temporary quantum change in gravitational laws and subatomic particle rotations within our solar system. Simply put, for a short time, the gravity quantum collapse tore all the larger objects within our solar system apart. Planets, moons and even larger asteroids and comets were fragmented into hundreds and thousands of pieces, creating new asteroid belts, marking the former orbits of planets. Together with the rest of the planets and moons, Earth was essentially destroyed.

The era after the Solar Event resembled the **colonization of the new world** by the Europeans and the later gold rush during the 18<sup>th</sup>-19<sup>th</sup> century in what became the United States. The world order was shaken and although those in power became even stronger, there was a completely new wind in all spheres of society: political, religious, economic, military... A whole new lifestyle resulted as well, since

there was no longer solid ground to walk upon, nor the ability to harvest food supplies from the traditional farmlands of Earth. Mining the asteroids and planetary remains became necessary and it didn't take long for this process to rule most of the economy. Biogenic farms and hydroponic domes were built onto the space stations and became the main source of food for the privileged few, while the vast majority was fed with artificial food substitutes.

Greed, prestige and desire for personal achievement dominated the new successful social **class of privateers, freelancers and adventurers**, who took fate into their own hands while standing alone and relied only on themselves to survive and thrive. Considering those same people were the best pilots, miners and entrepreneurs in the remaining human population, major factions and employers were forced to use their services and hire them for particular missions; be it military, mining, transportation or exploration. New societies and guilds soon emerged from this setting – organizations which offered services and advantages to their members and allegiants while enforcing only basic laws and regulations to their members, giving them the same degree of freedom all of us were striving for in those times. Some of those new freelancers decided to remain neutral and performed only occasional contract jobs while others decided to join and remain loyal to only one of these new groups; thus emerged the Space Traders' Guild among those seeking the path of traders and businessmen. The famous Black Ravens were formed by the best mercenaries, combat pilots and navigators. Trade & Transport Ltd. and Space Mining Ltd. were formed as corporate counterweights to both independent freelancers and miners. Thus, the economic rectangle was formed.

Human action has always reflected the injustice and social struggles of its environment. Out of the bloody ashes of countless lost to the Event, a new dark setting arose to show us once again the animal clawing inside us. Of course there were space **pirates** even long before the Solar Event, but they were never so powerful and no one was ever scarred enough of them to consider them while planning operations in space, maybe apart of some peace seeking colonists with their families. However, the Solar Event scattered central power, weakened police forces, and the military had state matters to consider. In a few years, hundreds of pirate dens and hidden bases were formed and some of the groups numbering thirty, fifty or even more.

More importantly, an underground "mafia" network was formed, **the Syndicate**, mostly unknown before 2070, but emerging as an important influencer of politics in the 70's, – The Syndicate, employing



blackmail and corruption tactics to control important figures for their own agenda.

The rise of the **Fourth Reich** was yet another surprise, unexpected by any of the leading powers, but emerging almost instantly as a strong and vital rival to EAC and China. The movement began behind closed doors among (mostly German) Nazi circles and industrialists and did not make its presence known in public until 2070. However, many of the members and leaders of the upcoming Reich had secretly invested heavily into space colonization, mining and orbital facilities before the Great Solar Event, so although minor and unimportant in the pre-solar event times, once the new world appeared, the **Reichists** declared their own state with thousands of supporting citizens. What remains an unanswered question is whether they knew of the potential danger and prepared for the Solar Event in advance, since they were the ones who definitely benefited the most. By the time the Solar Event occurred, many of their officers, researchers and military had already moved into space, causing much controversy afterward. Some believe this conspiracy theory to be true. Others argue that they were merely preparing to create an empire of their own, far from the reach of the Earth bound politics – and when the crash of the Genesis project occurred, they simply realized their plans a bit earlier.

Be that as it may, what remains sure is the current state of affairs: the Nazis renounced their traditional racist ideology for the sake of pursuing **Maulerian Eugenics** (which cared more about individual genome potential and vital abilities of the man rather than factual race or skin color). This de-radicalization brought many great and successful minds and achievers among their ranks under a common goal: to create the best society, raise the most perfect population, organize the social structure according to scientific principles and – last but not the least – use the latest technological advances in the fields of genetics and cybernetics to utilize their human potential to its fullest.

**Slavery** emerged once again. New world order widened the social gaps between the rich and the poor. The major key to this differentiation was whether or not one was successful in gaining influence over some group or otherwise making themselves useful and needed. The secondary determining factor was whether or not the group had access to a spaceship or any other kind of space premises in their possession. Thus there was the class of the successfully employed, the class of the independent space runners and ... the rest - those who were eating the food rations, breathing the air, occupying the living quarters. Some of them joined the outlaw groups while others fell into the dirt of slum life, suicides, prostitution and even slavery. Many humans were simply content to work day and night without a salary, just for the sake of having a sip of water and a bit of artificial soup, and were willing to do mostly anything. Slavery soon institutionalized and became legal in some of the factions, while others claimed it to be a backward step and pointed to basic human freedoms. Within the economic slave society, a new type of war slave emerged thanks to advances in biological research. Protein Specific Poison became highly popular, allowing the slave-masters or conquerors to employ a specially designed poison within the victim or target groups of bodies which became highly



addicted and would require small amounts of the specific protein antidote every several hours in order to survive. The process of synthesizing the poison from protein only worked in one direction, so if the slaves were possibly freed and medically treated, even the technologically advanced laboratories of OmniCorp or FSRE would be unable to create an antidote based on the imprints of the poison found in the slave's body.

The new era for mankind has begun - a time where only the brave and strong survive.

- From the *Chronicles of 21<sup>st</sup> Century* (2079)  
Arthur Higgins (2016-2079)

## Major Events of the 21<sup>st</sup> Century

**2021 – Chinese Space Station (CSS)** The program begins., shuttles with materials are launched with equipment for construction of mankind's new space station, solely Chinese, independent of International Space Station.

**7th October 2029 – Euro-American Confederation** founded. USA, NATO and EU merged after years of diplomatic negotiations into one humongous super-power as a counter reaction against growing economic strength of China.

**26th October 2029 –The beginning of the Second Cold War.** China and Russia signed Anti-Imperial pact, stating that “both nations (...) shall keep their sovereignty and independence (...) and support each other in economic and political struggles against any present or future capitalist conspiracy or threat”.

**2029 – Chinese Space Station construction finished,** China is able to conduct independent hi-tech research experiments outside the Earth's gravity field and are unmonitored by international media and scientific public.

**2030 – Plans for new EAC space station Prometheus** - Earth orbiting space station replacing ISS announced.

**2033 – Prometheus is habitable** and long-term stay of up to 160 astronauts is possible. Foundries and other space facilities are being added continually.

**2038 – Laboratory complex on Mars' moon Deimos opens** - G.F. Mauler is appointed head of research staff. Laboratories are funded by secret Nazi power circles and industrialists and conduct illegal biotechnological and genetic research.

**2040-2057 – Era of great space colonization** conducted by all major nations on Earth. By 2057, a huge census of space colonists is held, leading to shocking results: China – 74,362 colonists, EAC – 61,398 colonists.

**2049 – Maulerian Eugenics** - G.F. Mauler publishes his research of human genome modifications and his vision of society, entitled, “**Thoughts on Space Human**”. His ideas soon strike the public intellectuals, his world-view is commonly dubbed as, “Maulerian Eugenics”, seen under a stamp of semi-Nazi thinking.

**2051– OmniCorp** - As a unique gesture in history, the immensely powerful OmniCorp company declares independence from the EAC and achieves international recognition as an independent non-state subject to international relations.

**2061 – Catholic Enterprise** - Pope Maxmilianus II orders massive space colonization to be done by Catholics and invited people to embark on “**The Space Crusade**” on which “(...) the Cross shall bring light into the dark depths of vast space.” By the time of Great Solar Event of 2070, over 20,000 Catholic colonists answer the Pope's call.

**12th April 2061** – EAC's branch scientific division FSRE officially announces plans for the construction of **Project Genesis**, a set of nine massive space stations to harness energy directly from the Sun.

**2063** – Mauler introduces "**The Seven Reborn**", a test group of genetically altered, cybernetically augmented and psychologically re-educated prisoners. The Seven Reborn issue soon becomes highly controversial and all further DNA alteration research on humans is banned. Deimos Labs closes, and Mauler is arrested for violating scientific doctrines.

**2068** – A census declares over 200,000 Chinese citizens living in space.

**27<sup>th</sup> June 2068** – *Marcus Rainier graduates from McGill University (Astrogeology), age 23 years.*

**2070 – Solar Event** - Project Genesis launches, leading to the wide scale destruction of the solar system called **The Great Solar Event**. Moons and planets are shattered into pieces, creating new asteroid fields. Billions of people perish on Earth. Resulting solar storms claim the lives of thousands of space colonists. EAC is held responsible for the accident, especially by its major enemy, China.

**2072 – Official accusations against EAC** - Leading scientific personnel are claimed, international court processes are held.

**2071 – The Fourth Reich is officially formed. This new post-Nazi establishment operates** out of space stations, colonies and facilities previously funded and controlled by Nazi power circles, wealthy families and important politicians, scientists and industrialists.

**22nd November 2075 – Fratres Militiae Templi** (popularly called just Templars) founded and officially recognized.

**2081 – Current time of Miner Wars 2081, eleven years after the Great Solar Event.**

Part I.

# Factions, Nations, Corporations

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# Major Factions

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**EAC – Euro-American Confederation**

**PRC – People’s Republic of China**

**FOR – Fourth Reich**

**OC – OmniCorp**

Note: Major Faction – strongly involved in the main storyline, more amount of nation-specific content (ship designs, personalities, history, space bases and sectors etc.).

## Euro-American Confederation (EAC)

*Motto: United We Stand - Divided We Fall.*

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National State Faction / Confederation

Importance: High (9/10)

Territory: Large (7/10)

Wealth: Rich (7/10)

Technology: Advanced (8/10)

Aggression: Medium

Citizens/Members: 40,000 – 60,000

Politics: Democracy, Capitalism

Religion: Individual Religious Freedom.



**Description:** By many other factions, EAC is held responsible for the current situation of mankind. Being a mixture of democracy, individualism and capitalism, EAC is a hive of neo-post-modern space culture combining hundreds of various life views, religious, political and racial backgrounds and social standings. Before the Great Solar Event, EAC was participating in the Second Cold War and Second Space Race with China (supported by Russia).



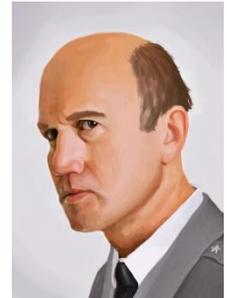
Unlike the situation in the First Cold War, where the United States clearly overwhelmed the Soviet Union, both the Second Cold War and Second Space Race were much more even endeavors. China also achieved more success in the Pre-Solar Event space construction and mining. However, EAC still had far more links with the world's most important democratic countries, which finally lead to its technological and economic superiority on the Earth. Meanwhile, China managed to achieve superiority in space (according to the population census of 2057). China employs the power of unity, de-individualization and the strength of symbolism. The direct result is a national communist identity, leading into great sport, military and production achievements at the cost of innovation and efficiency. Conversely, EAC utilizes the best of human potential thanks to combining private sector ingenuity with right-wing politics. This gave EAC an inherit advantage over China in the fields of science, technology and political

influence. EAC maintains trade and other partnerships and treaties with most of the legal factions in the post-Solar universe, while China chose to isolate itself to its only partnership with Russian Union.

**Representatives:**

President Christine Fawkes (\*2041),

Supreme Commander William Norman White (\*2031)



**Timeline:**

**4th April 1949** – North Atlantic Treaty – NATO forms as a reaction to the events of World War II. Apart from western European countries, NATO founding members included Canada and the United States, making it a counter power to the Soviet Union.

**1989** – With the fall of the Iron Curtain, Europe is no longer divided into Western and Eastern territories.

**1992** – Maastricht Treaty - The European Union is born out of 12 members of former European Communities.

**28th January 1998** – 15 governments signed the Space Station Intergovernmental Agreement. Works on International Space Station (ISS) begin. The ISS is expected to remain in operation until at least 2020.

**7th October 2029** – The United States, NATO and EU merge after years of diplomatic negotiations into one humongous super-power as a counter against the growing economic strength of China. Euro-American Confederation is born from the former EU, United States, Canada, Australia and members of NATO. The new conglomerate is officially formed upon the Universal Declaration of Human Rights from 1948, revised more recently in 2024. All members of EAC accept the additional amendments; Russia and China refuse to sign, decrying its “crypto pro-western attitude”.

**11th October 2029** – Just a few days after formation of EAC, Russia and China conduct military training together.

**14th - 15th October 2029** – Chinese president Hu Yinping and Russian president Mikhail Fjodorov meet for two days of long negotiations.



**26th October 2029 –The beginning of the Second Cold War.**

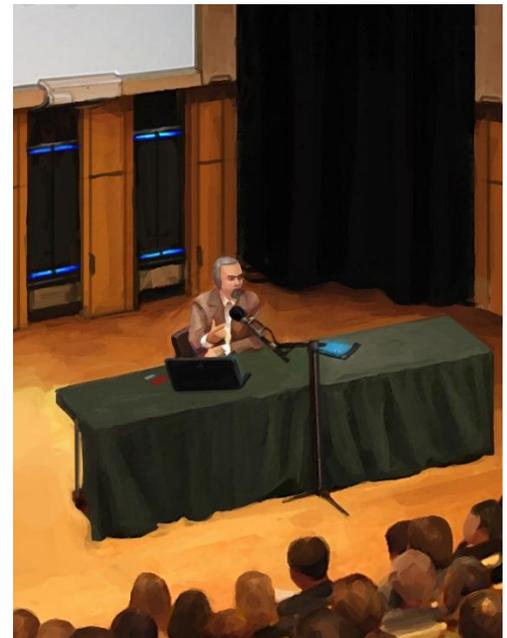
China and Russia signed Anti-Imperial pact, stating that “both nations (...) shall keep their sovereignty and independence (...) and support each other in economic and political struggles against any present or future capitalist conspiracy or threat”.



**2030** – ISS, even after extending its lifetime due to reparation and change of most of its components is becoming obsolete and is scheduled for dismissal in 2032. Meanwhile, plans for a new confederation space station are conceived; the project is given the name Prometheus.

**2031** – First shuttle with crew and parts for construction of Confederation’s Prometheus is launched. Intensive operations follow in the next two years.

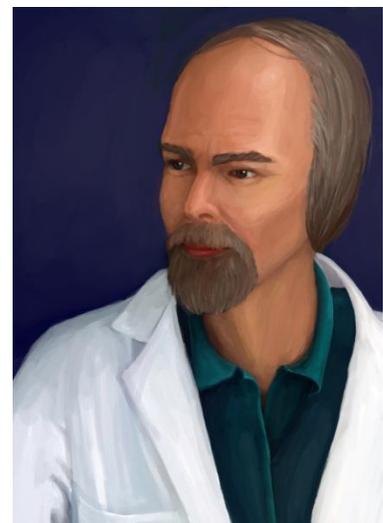
**2033** – Prometheus is habitable and long-term stay of up to 160 astronauts is made possible. However, compared to ISS, Prometheus is meant to be suitable not only for research purposes, but also as a preliminary space foundry and drop-off point for materials mined on asteroids. The project is still a few years behind the Chinese Space Station, however, significant progress is made and hi-tech equipment is employed.



**2034** – First mining ship successfully unloaded its cargo in Prometheus Orbital Foundry. Within less than a month, materials are processed and the first Confederation mining ship is built completely in space using asteroid-mined materials. The Confederation is only two years behind schedule compared to China.

**2040-57** – The era of great space colonization is conducted by all major nations of Earth. By 2057, a huge census of space colonists is held, leading into shocking results: China is represented by 74,362 colonists, while EAC 61,398 colonists. Despite all efforts, China seems to be more successful in the Second Space Race.

**12<sup>th</sup> April 2061** – EAC’s branch scientific division FSRE officially announced plans for the construction of Project Genesis. China objects, but arguments of Chinese politicians and scientists are considered merely a part of anti-imperialist propaganda. While Chinese space industry is more wide spread than that of the EAC, China is envious of the EAC’s high-end technological advancements. Project Genesis only increases



Dr. Jean Rainier

Chinese envy and fervor of their scientists, however, the Chinese have no possible means to thwart the EAC plans for Genesis.

**2070** – Project Genesis launched, leading to the catastrophic wide scale destruction of the solar system called **The Great Solar Event**. Moons and planets are shattered into pieces, creating new asteroid fields. Billions of people die together with the Earth, massive solar storms kill additional thousands of space colonists. EAC is held responsible for the accident, especially by its major enemy China.

**2072** – Official accusations against EAC and their leading scientific personal are claimed, international court proceedings are held. Dr. Rainier dies in an accident during his transport to the trial held in Chinese territory.

## People's Republic of China (PRC)

*Motto: For the Republic!*

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National State Faction

Importance: High (8/10)

Territory: Huge (9/10)

Wealth: Medium (6/10)

Technology: Medium (7/10)

Aggression: High.

Citizens/Members: 50,000 – 80,000

Politics: Socialism, Communist Party Dictature

Religion: Forbidden / Atheistic Materialism

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Description: One of the most powerful factions in the Post-Event world and definitely the most populated. China managed to make a technological and economical breakthrough during the 21<sup>st</sup> century, setting it aside the major economic giants such as The Fourth Reich or Euro-American Confederation. PRC controls the largest territory and owns most of the asteroid mining facilities; however, it is still a step behind the two mentioned factions in terms of technology and geopolitics. Chinese care for their territory, protecting it using aggressive means. Diplomatically, their only friend is the Russian Union, and the rest of the political powers are either neutral or hostile towards them. Chinese don't mind human rights or other international law treaties and still hold a significant position in international politics thanks to their size, military power and material wealth. The only ships the Chinese tolerate in their own territory apart of their own are the small independent corporations (Space Mining Ltd., Trade & Transport Ltd.) China refuses any cooperation with OmniCorp and doesn't allow entry of their vessels into its territory, collaboration and any negotiation with OmniCorp is considered treason and is punished with the death sentence.

Chinese space military forces consist of over a thousand heavy fighters; the most popular of which are the Jiuquan II and III. Although not being the peak in the technology, Chinese leadership tends to send Jiuquan fighters in mid-sized wings of at least 8 craft and tactically using even larger groups of hundreds of those fighters, generally outnumbering the enemy.

## Representatives

President Yao Peng (\*2024),

Supreme Commander Wen Jintao (\*2032)



## Timeline:

**1949 – The Chinese Revolution** occurs, putting an end to conflict between two warring sides (Chinese Nationalist Party and Chinese Communist Party) and setting Mao Zedong and his communist party into the supreme rule of China.

**1966 – Shuguang 1**, first Chinese manned space shuttle development started.

**24<sup>th</sup> April 1970** – First Chinese satellite Dong Fang Hong successfully launched.

**1989 – Massacre at Tian-an-men square** takes place. The official body count is 241 dead. However, Russian politburo intelligence reports find in Soviet archives estimated over 3,000 deaths at Tien-an-men square and several thousands in the streets of Beijing. NATO intelligence estimates a total of 7,000 deaths. According to Chinese Red Cross, 2,600 die by the morning of 4<sup>th</sup> June. This event is later denied.



**15<sup>th</sup> October 2003** – First Chinese human spaceflight aboard Shenzhou 5 space shuttle. PRC thus becomes the third country in the world (after Soviet Union and United States) capable of independent human spaceflight launch.

**2021** – Chinese Space Station (CSS) program launched. Shuttles with materials and equipment for construction of mankind’s new space station, solely Chinese and independent of ISS also launched.

**2029** – The Chinese Space Station construction finished. China is able to conduct independent hi-tech research experiments outside the Earth’s gravity field and do so unmonitored by international media and scientific public.

**2037** – Several huge asteroid mining operations launched, over 200 Chinese space shuttles assigned for mining and transportation of the mined materials back to CSS take part. The orbital foundry creates several factories to produce ship parts and robotically assemble them while in orbit. Millions of tons of materials are mined every day for use by Chinese Space Program.

**2040-57** – China is able to send the largest population into space, outnumbering even Euro-American Confederation by thousands. There are over 70,000 Chinese citizens living long-term in space by 2057, outnumbering even EAC - China 74,362 colonists, EAC 61,398 colonists.

**2068** – A census declares over 200,000 Chinese citizens living in space.

**2070** – Solar accident crushes the population of Earth and causes decrease in number of people living outside the Earth’s boundaries as well. By 2071, about two thirds of the Chinese space population seems to be missing. The official census done after the solar event catastrophe results indicates there were 68,572 Chinese citizens alive.



**2072** – Chinese declare EAC to be solely responsible of the solar event and claim official charges against lead EAC politicians and scientists involved in Project Genesis.

**2073** – China bans all traffic through its territory by members of EAC and OmniCorp. During the first few months, several EAC citizens in their space ships attempt to make their journey shorter through the Chinese territory and are killed. Objections of EAC at the international court are unsuccessful; China maintains sovereignty over its territory.

## Fourth Reich (FOR)

*Motto: Purity and Perfection!*

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National State Faction

Importance: High (8/10)

Territory: Medium (5/10)

Wealth: Rich (7/10)

Technology: Advanced (8/10)

Aggression: Ultra High

Citizens/Members: 15,000 – 20,000

Politics: Technocracy, Dictature, National Socialism

Religion: Atheism, Maulerian Philosophy

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**Description:** Born from the descendents of influential Nazi families of 20<sup>th</sup> century Germany, Nazi “nobility” maintained secret conspired organizations and power circles up to 21st century and managed to venture into space by 2050’s. (Most) postmodern Nazis abandoned racist beliefs and adopted new paths to genetic purity – eugenics, population control and Maulerian genetic engineering – in order to create the perfect society. This de-radicalization brought many great and successful minds and achievers among their ranks under common goals: to raise the most brilliant population, organize the social structure according to scientific principles and – last but not the least – to use the latest technological advances in the fields of genetics and cybernetics to drive their human potential to its fullest.

### Representatives:

Chancellor Hermann Dönitz (\*2036) , descendant of Dönitz family.

Supreme Commander Heinrich von Greim (\*2041), descendant of the von Greim family.



**Timeline:**

**2038** – Deimos laboratory complex opens, G.F. Mauler appointed head of research staff. Laboratories are funded by secret Nazi power circles and industrialists.

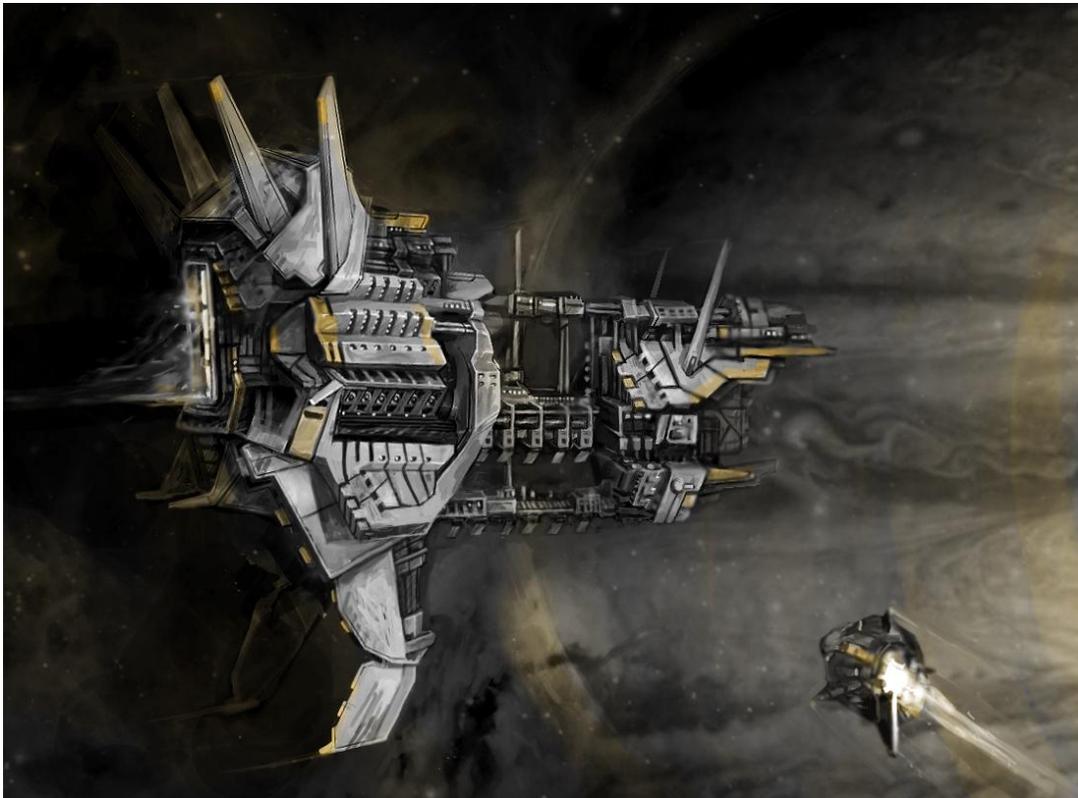
**2043** – Deimos lab makes significant discoveries, introduced at International Scientific Conference held by EAC.

**2049** – G.F. Mauler published his research of human genome modifications and his vision of society under the title “Thoughts on Space Human”. His ideas soon struck the public intellectuals, his world-view is commonly dubbed as “Maulerian Eugenics”, seen under a stamp of semi-Nazi thinking.

**2063** - Mauler introduced a group of “The Seven Reborn”, a group of DNA altered, cybernetically augmented soldiers and psychologically re-educated prisoners. The Seven Reborn issue soon became highly controversial and all further DNA alteration or research on humans was banned. Deimos Labs closed, Mauler was arrested for violating scientific doctrines.

**2070** – Mauler dies in Quebec, Canada during the Great Solar Event.

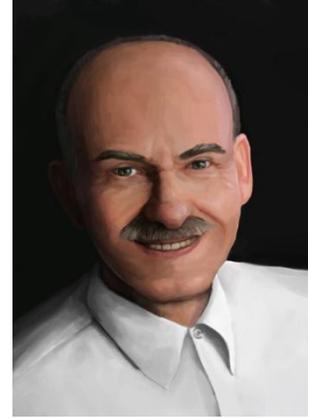
**2071** – The Fourth Reich officially formed out of space stations, colonies and facilities previously funded and controlled by Nazi power circles, wealthy families and important politicians, scientists and industrialists.



## Appendix I.: Maulerian Eugenics

(See more below in chapter Technology – Genetics)

The concept of ideal human beings raised from the genetically best parents has drawn the attention of mankind since early antique times on Earth. It was brought once again into public debate thanks to the great discoveries of Darwin, Mendel and others in the 18<sup>th</sup>, 19<sup>th</sup> and 20<sup>th</sup> century. However, because of the general atmosphere of the late 20<sup>th</sup> and early 21<sup>st</sup> centuries, genetic improvements on human beings were done only in secret and outside of the public view. The change came with the rise of postmodern Nazi ideology obtaining public influence thanks to the powerful Dönitz and Greim families in 2030's. Complex laboratories were built outside the influence of Earth's governmental



influence on Mars' outer moon, *Deimos*. The laboratories were officially opened in 2038 as a facility for biological research on apes, with the head of research staff, Gregor Fitzgerald Mauler; a young and promising German scientist. But that was only a front. The real research on Deimos focused on humans



instead of apes, simultaneously focused on human genome alteration, genome experiments and implementation of altered DNA into human embryos. In 2043, the Deimos lab made significant discoveries as to the nature of severe human diseases and revealed their discoveries at the international scientific conference (while still hiding the true nature of their experiments behind the experiments on apes), Mauler and his team received a great reception and were given billions of dollars in funding from international authorities for their continued research. Secretly, experiments on living prisoners and other humans were conducted, killing tens of subjects every day. By 2046, (according to World Health Organisation) Deimos discoveries led to the rescue of over 30,000 patients.



## OmniCorp (OC)

*Motto: We Own the Shares!*

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Non-National Faction / Independent Corporation Cluster

Importance: High (7/10)

Territory: None (0/10)

Wealth: Rich (9/10)

Technology: Ultra Advanced (9/10)

Aggression: Low / Neutral

Citizens/Members: 8,000 – 12,000

Politics: Corporate Management

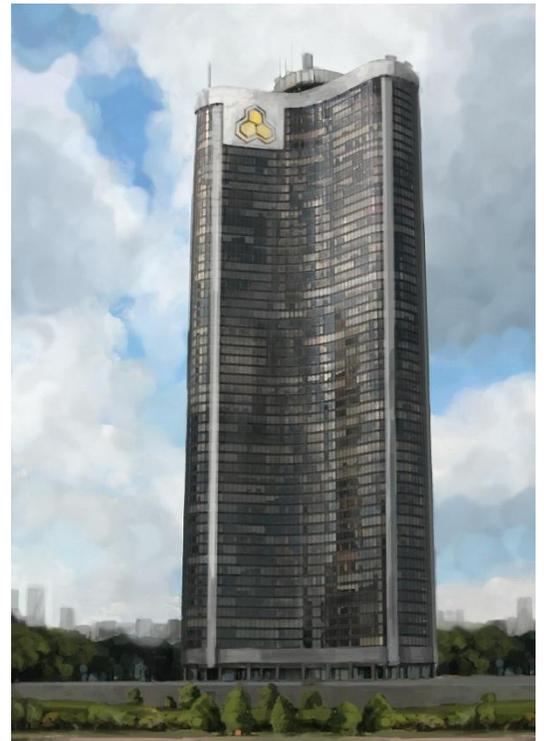
Religion: N/A, Individual Religious Freedom



**Description:** OmniCorp holds a specific place in the post-Solar Event universe. Although the number of members within this faction is not as high as in some other cases, OmniCorp is definitely among the top power holders thanks to several factors: high technological research and production facilities, well-educated, qualified personnel and specialists and last but not the least great economic potential and ownership of shares in many of other factions and corporations. OmniCorp holds a lot of investments inside all major factions cooperating with them (that is, except for China, Russia or in some situations, Arabs). As a result, OC has a lot of connections amongst diplomats, industrialists and decision makers across the political scene.

OmniCorp nowadays focuses mainly on three fields of interest: Development and production of new high-end spaceships (including equipment and weaponry); transport services (OC owns tens of huge inter-sector transport ships); and research and development in the fields of advanced information technologies (including software solutions for corporations and military, AI research, software for applied biomechanical and nano-tech implants, etc.).

The official OmniCorp motto is inscribed within three conjoined hexagons (like in a bee hive), signifying “3 P” – Progress, Profit, Prosperity.



**Brief History:**

Originally founded in 2038 by Stuart J. Solomon, OmniCorp first started as a small space research and development company called “SolTech”. SolTech, seated on the Prometheus Space Station, outsourced internationally picked engineers, technicians and physicists to the Prometheus Orbital Foundries. In this manner of operation, Stuart Solomon came into close contact with Nikolas Remenko, a former Russian nuclear scientist, who focused on the use of nuclear engines with newly manufactured mining space ships. Thanks to the business skills of Solomon, SolTech soon



acquired a majority of shares of Prometheus Orbital Foundries and was elected as their chairman and CEO in 2042. Thanks to the four years of successful mining operations and wide-scale space construction done by new waves of space colonists, in 2046 Solomon acquired ownership of the whole Prometheus Space Station and together with Remenko transformed SolTech into OmniCorp. Instead of sharing profits and control with other share owners of Prometheus, Solomon offered all the investors shares inside Prometheus and thus OmniCorp became the sole owner of Prometheus.

**Timeline:**

**2038** –OmniCorp predecessor company SolTech founded by S. J. Solomon.

**2042** – Solomon elected Chairman of Prometheus Orbital Foundries.

**2046** – OmniCorp founded as a successor of SolTech at the occasion of acquisition of ownership of Prometheus Space Station.

**2049** – Marketing results show interesting facts – OmniCorp mining operations (tons of mined materials) precede both EAC and PRC.

**2051** – After serious negotiations, OmniCorp declares independence on EAU and achieves international recognition as an independent non-state subject of international relations. OmniCorp still allows Prometheus to be used by EAC and relationships are kept on business level.

**2052** –OmniCorp obtains special rights from international court – among many, OmniCorp employees became OmniCorp citizens Th company itself takes care of all its employees’ needs – healthcare, security, living quarters, education and entertainment. Their Citizens can still maintain dual citizenship, i.e. both OmniCorp as well as their former nationality.

**2061** – EAC officially announces plans for Project Genesis and opens a public competition for the supplier of materials, equipment and certain technological solutions. OmniCorp wins the competition, since no other applicants could meet the requirements. Other corporations complain at the international court; however, their claims are rejected. A budget of over 37.2 trillion USD is poured into

OmniCorp. Within two years, the company hires over 2,400 additional employees (compared to 2718 according to census in 2061), nearly doubling its population base.

**2070** – Project Genesis launches and the ensuing catastrophe puts the public eye on EAC government and OmniCorp. An International team is sent to OmniCorp Laboratories to thoroughly investigate the possible reasons for the failure – personal, technological, material or other. Findings are inconclusive.

**Representatives:**

Chairman of Board Stuart Jacob Solomon (\*2017)

Chief Science Officer Nikolas Remenko (\*2019)

Chief Development Officer Yen Li (\*2048)



## Minor Factions

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**RUF – Russian Federation**

**JAP – Japanese Empire**

**IND – Free Republic of India**

**AIE – Arab Islamic Empire**

**CHC – Commonwealth of Holy Church**

**FSRE – Foundation for Space Research and Exploration**

**FAS - Free Asia**

**CSR – Czecho-Slovak Republic**

Note: Minor Faction – not that important in storyline or not influential in the world politics, player is not expected to have much contact with them. Less description and detail is given to minor factions.

## Russian Federation (RUF)

*Motto: For the Fatherland!*

National State Faction

Importance: High (7/10)

Territory: Medium (6/10)

Wealth: Medium (5/10)

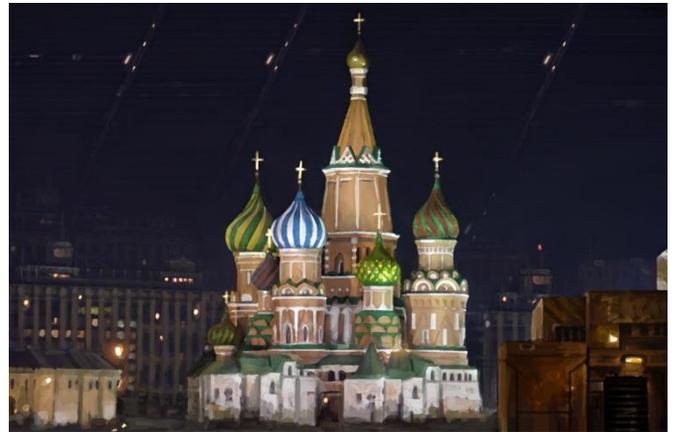
Technology: Medium (5/10)

Aggression: High.

Citizens/Members: 30,000 – 40,000

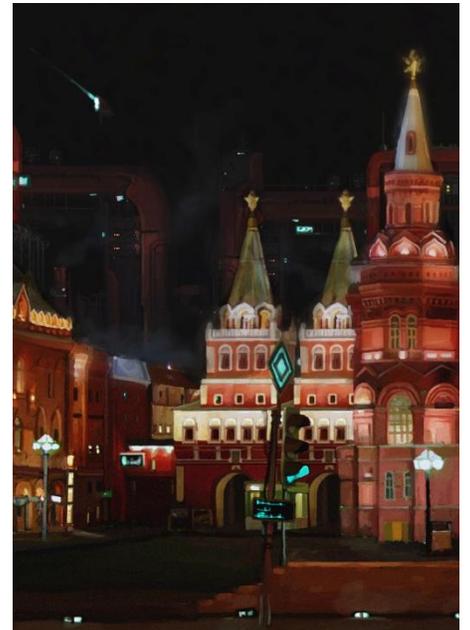
Politics: Republic, Strong Leader Dictature

Religion: Orthodox



**Description:** Russia saw a radicalization of their politics in the 21<sup>st</sup> century. In 2029, when the EAC was formed, Russia quickly formed a pact with China, stepped out of the ISS program and started to enforce strict anti-western politics, which deepened after the failure of the Genesis project. While not successful in employing their own space program in full, a lot of cooperation between Chinese and Russian scientists and industrialists was done and resulted in shared Chinese-Russian orbital facilities and mining asteroid facilities in the first half of the 21<sup>st</sup> century. Russian economy as well as science is presently a bit behind the Chinese (as well as the EAC), however, it is still an important player on the field of international politics and occupies a significant ore-rich territory.

Representative: President Jurij Nikolajevic Charkov (\*2038)



## Japanese Empire (JAP)

*Motto: Honor is above all.*

National State Faction

Importance: Medium (5/10)

Territory: Medium-Low (4/10)

Wealth: Medium-Rich (6/10)

Technology: Advanced (7/10)

Aggression: Medium

Citizens/Members: 12,000 – 18,000

Politics: Imperial Dictature, Capitalism

Religion: Buddhism, Shinto



**Description:** The Japanese were one of the factions that actually benefited from the Solar Event thanks to their immense space program and vast investments in technology, asteroid mining facilities and space operations. Over ten thousand Japanese citizens moved into space by 2061 and even more followed until the Solar Event, establishing several mining colonies, experimental bio-domes on space stations and even funding military facilities outside the Earth's boundaries. They held the EAC guilty for the failure of Genesis project; however, since they consider the Chinese their worst enemies, they maintained neutrality and closed themselves off like some of the other minor factions. The Japanese conduct business with India, Arabs and independent groups and not much is known about their internal politics or economic situation. Media and other informational means are strictly controlled by the government and the post-solar event times saw a radicalization and strengthening of the position of the Emperor. Still, the Japanese uphold human freedoms and employ capitalist politics, putting them in possible cooperation with international corporations and occasionally with OmniCorp.



Representative: Emperor Osami Takahito (\*2026)

## Free Republic of India (IND)

*Motto: Vande Mataram (I bow to thee, Mother!)*

Minor National State Faction

Importance: Low (4/10)

Territory: Medium-Low (4/10)

Wealth: Medium (4/10)

Technology: Medium (5/10)

Aggression: Low.

Citizens/Members: 20,000 – 30,000

Politics: Democracy

Religion: Religious Freedom, Plurality (Hinduism, Buddhism, Sikh)



**Description:** India is among the minor political players in the post-Event world. The country had long democratic and capitalist history ranging back to the times of occupation by the British Empire. As a result, their negotiations and peaceful relations with EAC is no surprise. India has a high population and employs a somewhat successful space program, although not competing very well with its Asian “neighbor”, China. They try to maintain peaceful foreign politics as much as possible, and as a result have few enemies. Rather, they concentrate on their own internal problems. Soon after the Solar Event, India became a synonym for a peaceful democratic country with a mediocre social and economic situation.

**Representative:** Chancellor Ram Dwarkanath Bagh (\*2049)

## Arab Islamic Empire (AIE)

*Motto: Qur'an is our Law.*

Minor National State Faction

Importance: Low (3/10)

Territory: Low (3/10)

Wealth: Medium (5/10)

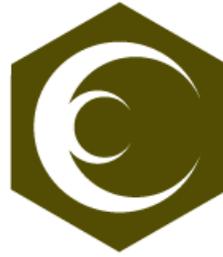
Technology: Medium (6/10)

Aggression: Low

Citizens/Members: 8,000 – 15,000

Politics: Theocracy, Islamic Law

Religion: Islam (Sunni)



**Description:** The united Muslim initiatives and governments managed to launch a successful space program, operating space tourism facilities as well as orbital foundries and industrial complexes. Thanks to the visionary zeal to explore and invest into space colonization, many Muslims joined the space enterprises and quite an influential number managed to survive and thrive in the post-Solar Event times. Arabs distance themselves from international politics and restrain from making relationships and pacts with any of the major factions. Instead, they are busy in trade and industrial expansion projects within their own territories and sometimes are in cooperation with some of the independent groups (Traders' Guild, Black Ravens, some of the companies etc.).

Representative: Shah Mohammad Salih Akbar (\*2030)



## Commonwealth of the Holy Church (CHC)

*Motto: In Nomine Patris, et Filii et Spiritus Sancti.*

Minor Non-National / Independent Faction

Importance: Medium (5/10)

Territory: Small (2/10)

Wealth: Medium (5/10)

Technology: High (7/10)

Aggression: None / Peaceful.

Citizens/Members: 12,000-18,000

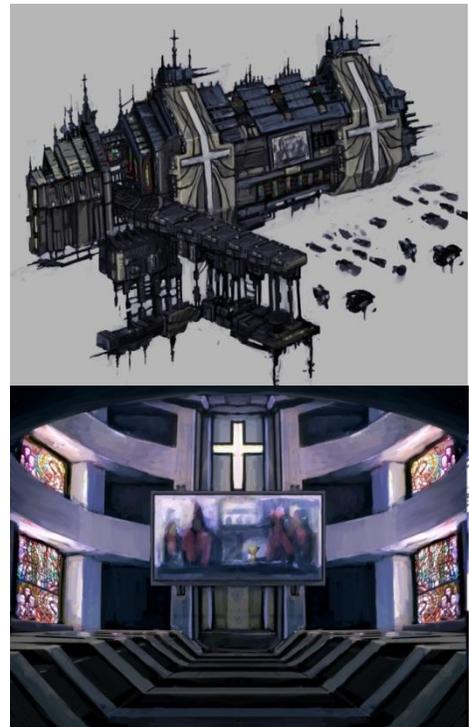
Politics: Theocracy / Social Democracy.

Religion: Christian (Catholic)



**Description:** The Catholic Christians were the only religious group able to make a space program of their own in the 21<sup>st</sup> century apart of the Muslims. The Pope Maxmilianus II (enthroned 2061) ordered massive space colonization to be done by Catholics and invited people to come on “The Space Crusade” on which “(...) the Cross shall bring light into the dark depths of the vast space”. By the time of the Solar Event, over 20,000 Catholic colonists, adventurers and “crusaders” had joined the call – and so escaped the catastrophe induced on the Earth. A few weeks after the Solar Event, the Pope called for important and strict rules to be enforced among the Commonwealth. Some of them included a ban on the use of weapons and other restrictions on arming, while a new order for the protection and enforcement of justice was enacted. Pilots chosen to carry out this enforcement are among the best of the faithful and are equipped according to the best known technological standards by OmniCorp Foundries.

**Representative:** Pope Maxmilianus II (\*2024)



## Foundation for Space Research and Exploration (FSRE)

*Motto: Research and Development.*

Sub-Faction of EAU

Importance: High (7/10)

Territory: None (0/10)

Wealth: Rich (7/10)

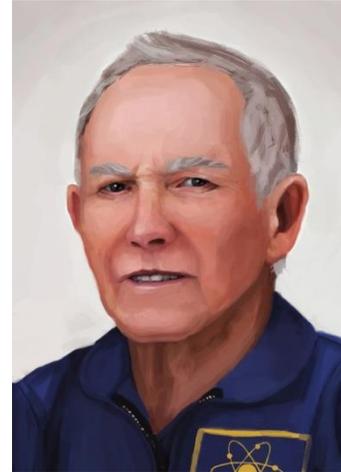
Technology: Advanced (8/10)

Aggression: Neutral

Citizens/Members: 300 – 500

Politics: Corporate Management

Religion: N/A



Description: For a time the founding members were spread across several different countries. After the chaos of the Solar Event began to subside, it eventually became evident to the surviving scientists and researchers that they must continue their work in order to keep the resources flowing and keep humanity afloat.

Although some stayed with their nations and factions, some of them decided to form a separate political group and launch an enterprise of their own. Quite soon after the Solar Event, in 2071, FSRE managed to run the first and soon prestigious college at Greenbelt Space Station, offering military, astronomical and technical education. Using their collective genius, they quickly established their independence from the EAC by designing their own ships and forming a relationship with the independent and neutral groups to actually build these ships. Apart from offering high quality research, their main role today is exploring uncharted territories to form a complete map of the solar system as well as gathering information on what sectors yield what kind of ore and how much.

Representatives: Director Matthew Bryan (\*2018)

## Free Asia (FAS)

National State Faction / Union of Republics

Importance: Small (3/10)

Territory: Small (1/10)

Wealth: Medium (5/10)

Technology: Medium (5/10)

Aggression: Neutral

Citizens/Members: 13,000 – 15,000

Politics: Democracy

Religion: Religious Freedom, Atheism

A union of republics formed in 2070 as a quick response to the Solar Event and as a protection to Chinese and Japanese possible claims of their territories and possessions. Free Asia consists mostly of colonists, miners, researchers and employees of some space industry companies, who insisted on keeping their original nationality and belongings forming essentially a sovereign political body of republics, independent of other factions.

## Czecho-Slovak Federation (CSF)

National State Faction

Importance: Small (2/10)

Territory: Small (1/10)

Wealth: Medium (5/10)

Technology: Medium (5/10)

Aggression: Neutral

Citizens/Members: 4,000 – 8,000

Politics: Republic, Democracy

Religion: Religious Freedom, Atheism

Although not having a state-of-art space program, the Czech and Slovak population managed to manufacture vessels intended for mining, exploration and other colonization related missions. This

faction is not deemed important in international politics, however, many skilled scientists, developers and public intellectuals come from their ranks.

## Keen Software House (KSH)

Non-National Faction / Corporation

Importance: Small (2/10)

Territory: None (0/10)

Wealth: Rich (6/10)

Technology: High (8/10)

Aggression: Neutral

Citizens/Members: 2,000

Politics: Republic, Democracy

Keen was originally a game development company from early 21<sup>st</sup> century. However, after the major success of their products and that of space travel and industry, the company moved to development of operating systems and artificial intelligence software solutions for space ships. Today, KSH is one of the main suppliers of spaceflight software and the first wireless neural-network pilot interface. Company founder and CEO Marek Rosa still leads the company, kept alive thanks to cybernetic organs and genetic alterations done at Deimos labs in 2061.

# Groups and Social Classes

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**Space Pirates**

**Independent Miners**

**Freelancers**

**Black Ravens**

**Space Trader's Guild**

**The Syndicate**

**The Templars**

**Space Rescue Ltd.**

**Trade & Transport Ltd.**

**Space Mining Ltd.**

## Minor factions and groups

### Space Pirates

Population: Probably a few thousand.

Not a faction in a sense of centralized rule, rather a faction in the sense of similar aspects shared among many space pirates. They tend to make small groups of up to 50 members, generally sharing profits from looting and other illegal operations. Sometimes they even do legal mining operations, when they seem profitable. But generally speaking, they prefer leaving the dirty job to someone else. Pirate groups occupy either a small asteroid base (hidden inside the asteroid to keep the prying eyes of their enemies out of their treasures) or within a small cruiser spaceship, equipped with weapon factories, chemical labs and other facilities designed to supply them with warfare tools or valuable goods. One pirate group may accept a contract against other pirate groups, unless there is some loyalty bond between them. For example, someone from the other group may have saved the life of the first group's leader etc. Pirate leaders (called Captains) tend to dress in a fancy way, resemble the old pirates of yore.



### Independent miners

Population: Probably between a few hundred to a few thousand.

Many peaceful, but courageous individuals are walking the path of space miners and explorers. Mining operations in space require advanced education in the fields of engineering and astrogeology, since the technology in 2081 still can't substitute for an individual's personal qualities, abilities and experience. Independent miners tend to avoid fights and disputes, however. Many of them bear heavy weaponry aboard their ships to ensure protection from pirates and other various rouges wandering in the post-solar event space. Miners may perform solo mining operations or may form small groups of friends and companions.



## Freelancers

Population: Probably a few hundred.

Somewhat similar to miners, but the range of their activities is the most vast and somewhat more dangerous. Apart of mining operations, freelancers trade with various other goods (sometimes including illegal contraband and weaponry) and frequently perform contract assignments for influential factions. Some of them have a sense of honor and choose work according to personal creed, so they may refuse to do certain kinds of “jobs” or may refuse to work with pirates or some factions. For example, upon personal background they may refuse to work with China, EAC, OmniCorp or other big powerful factions. Freelancers are generally the most experienced miners or pilots for major factions, due to surviving several clashes with pirates or some inter-faction disputes. For this reason, they tend to be the best pilots in the entire known space; lonely wolves treading their own paths of fame, glory, profit, achievement and adventure.



Freelancers carry with them a reputation and seem to know each other after some time, since there aren't that many veteran space pilots in the known space. They either work individually or in groups, for certain assignments they may temporarily band into larger squads. All of their ships are outfitted with hard-core modifications and tuned according to the freelancers' taste and preferences, both visually and functionally.

## Black Ravens

Population: A few hundred.

Originating from strictly military organizations, typical mercenaries will work for any faction that pays them as long as the operation is not illegal or criminal and in cases where they are not asked to attack their own Raven companions. They offer escort of trade vessels and protection of mining ships in open space and during mining operations, aid during rescue operations and they even accept contracts for frontal assault between two major factions. Some governments regard them as enemies, some as a neutral workforce, who work for those who pay. They refuse dirty jobs involving drugs, slaves, prostitution and raids on civil population. When not on contract job, they typically raid pirate bases and hunt for the heads of wanted criminals or criminal groups. Technically, Black Raven pilots are quite similar to freelancers with one major difference – they regard all of their fellow Ravens as brothers and will not fight or betray them. In contrast, freelancers don't form any specific allegiance of their own and work only for themselves



or in small groups of companions. While freelancers may join both sides of the conflict and fight against each other, Ravens would leave the fight if they met other Ravens on the opposite side. Raven HQ keeps a watchful eye on Raven fighters working in the open space, so it is highly unusual that a contract involving Ravens on both sides would occur.

### Space Traders' Guild

Number: Over a thousand.

Independent traders and businessmen often choose to join the traders' guild for certain benefits it offers: centralized protection of convoys, marketing and law consultancy, tax refunds and information service about stock market and prices on most important trade ports and space stations in the universe. The guild also benefits from its neutrality and thanks to its management and politics, it has good relationships with all major factions. The goods of the guild's traders aren't unified and each trader focuses on different goods and assortment, however, no illegal wares (drugs, slaves, illegal weapons) are allowed aboard guild members' ships and this law is strictly controlled and enforced. In 2074, the guild started to mount cargo scanners aboard all guilders' ships, resulting in strictly legal and controlled cargo, a step well accepted by all factions, resulting in even further improved relationships. Space Traders have good relations with Black Ravens and often use them for the protection. Apart of trade, many of the guilders also offer transport services for smaller ships, drones and mining machines, competing their major rival OmniCorp.



### The Syndicate

Population: Ranging from a few hundred to a few thousand.

A kind of modern space mafia group; although there are several minor criminal and illegal groups, the Syndicate are the most notorious. Perhaps by design, not much is known about their numbers, rules of conduct or important leaders and personalities. What is known are the results of their actions and their activities: blackmailing, extortion and protection rackets, prostitution and slave trade, drugs and corruption are among the politics of major factions. The Syndicate members carry a vial of special inflammable poison with them, so in case there are caught alive, they consume the poison to immolate their bodies within seconds. There is no record of a Syndicate member being successfully captured alive. The Syndicate has no bases or ships of their own; they instead infiltrate their people among all other factions, leaving outwardly normal lives of citizens, scientists,



politicians and even military leaders.



### **The Templars**

Population: 314 (knights are replaced in case one dies to keep to this count)

Founded after the Great Solar Event as protectors of righteousness for the entire space, this faction is solely military, being funded from external sources. They have no territory of their own; their only space headquarters is a heavily guarded outpost - Fort Valiant at the borders of The Church. Templars own a military force of about 300 space craft, mostly heavy fighters and all-purpose combat fighters. Apart from “policing” the known universe and trying to enforce law in the inhabited space, they also act as protectors of The Church, since this faction has no military force of its own. Pilots are chosen both on their skill and experience as well as possessing a sense of justice, righteousness and faith.

### **Space Rescue Ltd.**

Population: A few hundred.

An Independent corporation that focuses only on rescue; they work as an insurance company – if you pay insurance fees and something bad happens, they send a ship and offer help - fuel, oxygen, protection, repair ship.

### **Trade & Transport Ltd.**

Population: A few hundred.

One of the corporations focused on trade and transportation services, working as a counterweight to semi-monopolist OmniCorp, membership-based Space Traders’ Guild and independent miners. The company is not very influential; however, it offers a nice choice of goods and services--and thanks to their neutrality--they are somewhat accepted by most of the factions.

### **Space Mining Ltd.**

Population: Between one and two thousand.

Similar to the previous company, but focused on mining, they employ miners who don’t want to pursue their own fate or risk buying or leasing a spaceship and offer full equipment and basic training for low classes while offering a standardized wage and share of the profits based upon one’s efficiency.

## Appendix I. - History of Templar Order

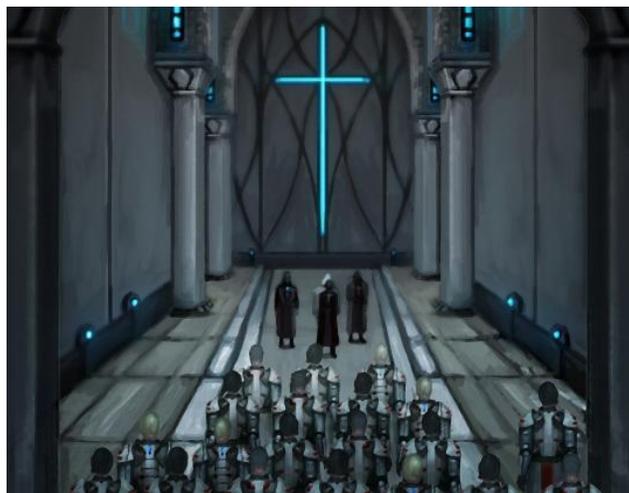
Representative: Grand Master Sir Jacques de Acre (\*2017) – former French high-ranking military officer.

**1119** – Two French crusaders from the First Crusade (1099) found an armed monastic order for the protection of pilgrims.

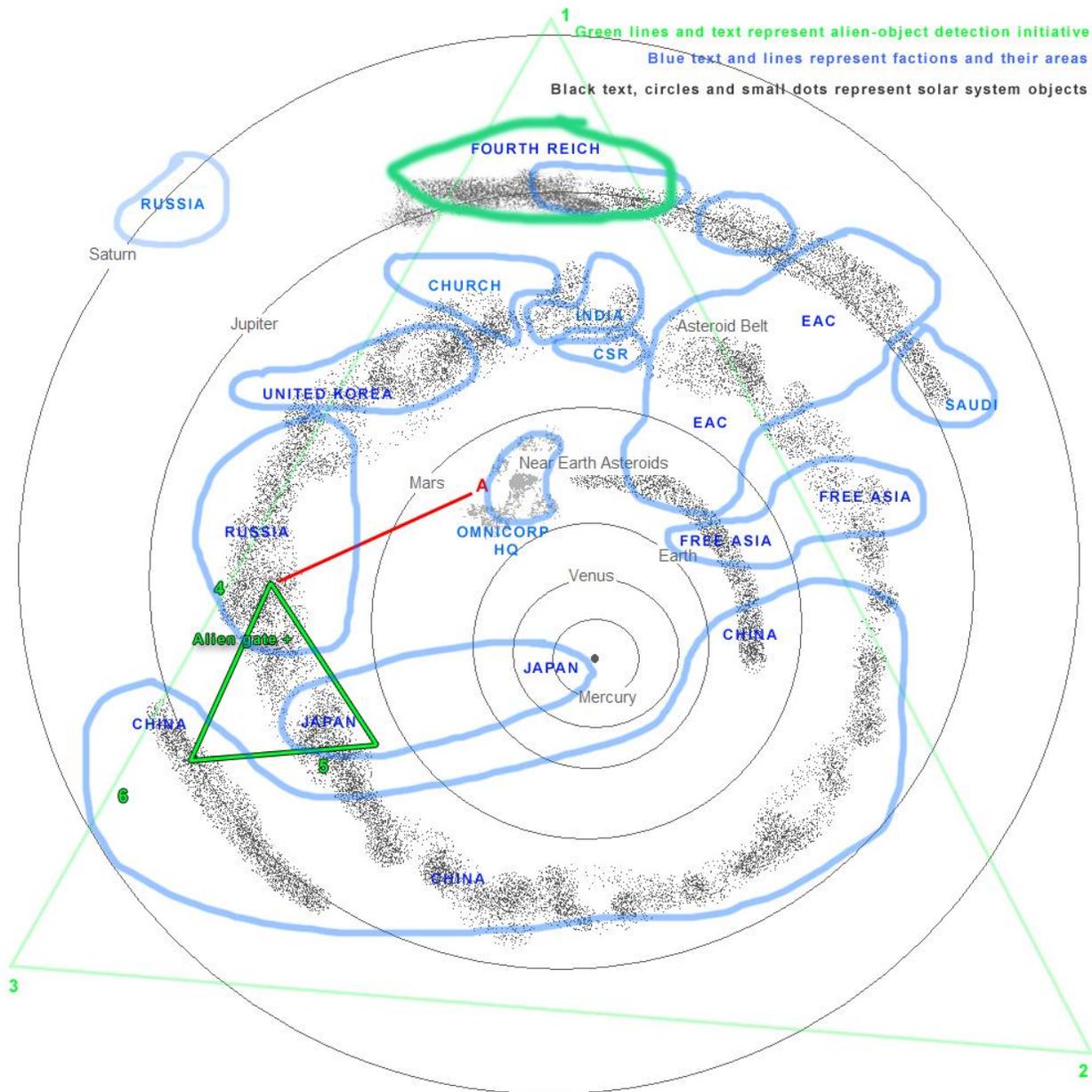
**1314** – Grand Masters and other knights of the Order unjustly declared as heretics, resulting in dissolution of the order after severe persecution (confiscation of property, trials and executions) from Philip IV of France and the Catholic Church.

**2072** – The Order begins after an edict from Pope Maxmilianus II.. The period of formation takes over 2 years. Several Church councils as well as business and political meetings with representatives of major nations and influential factions take place.

**22<sup>nd</sup> November 2075** – Fratres Militiae Templi (famously referred to as just The Templars) are founded and officially recognized. They are respected and funded by over 12 national and non-national factions as a neutral military peacekeeping force. 314 pilots are chosen among the faithful Christian Catholics and are equipped with brand new space craft made specifically for this task by OmniCorp Steelworks during the preparatory phase of '72-'74. Sir Jacques de Acre, a former French military officer and member of one of the influential “blue-blood” families was chosen as the Grand Master of the order. A common joke among the secular community: “How many Acres does it take to round up 314 *sheep*?!”



### Appendix III: Solar System Map - Draft



## Appendix IV: Relationships Matrix

	EAC	PRC	FOR	OC	RUF	JAP	IND	SUD	CHC	FSRE	FAS	CSR	Pirates	Miners	Freelancers	Ravens	Traders	Syndicate	Templars	Rangers	T & T Ltd.	SM Ltd.	
EAC	Black	Red	Red	Green	Yellow	Yellow	Green	Green	Green	Green	Green	Green	Red	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow
PRC	Red	Black	Red	Red	Green	Yellow	Red	Yellow	Red	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow						
FOR	Red	Red	Black	Yellow	Red	Yellow	Red	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow						
OC	Green	Red	Yellow	Black	Yellow	Red	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow							
RUF	Yellow	Green	Red	Yellow	Black	Yellow	Yellow	Red	Yellow	Yellow	Yellow	Yellow	Red	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow
JAP	Yellow	Red	Yellow	Yellow	Black	Black	Yellow	Yellow	Yellow	Yellow	Green	Green	Red	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow
IND	Green	Yellow	Yellow	Yellow	Yellow	Yellow	Black	Yellow	Yellow	Yellow	Yellow	Yellow	Red	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow
SUD	Green	Yellow	Yellow	Yellow	Red	Yellow	Yellow	Black	Yellow	Yellow	Yellow	Yellow	Red	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow
CHC	Green	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Black	Black	Yellow	Yellow	Yellow	Red	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow
FSRE	Green	Red	Red	Yellow	Red	Green	Yellow	Yellow	Yellow	Black	Black	Black	Red	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow
FAS	Green	Red	Red	Yellow	Red	Green	Yellow	Yellow	Yellow	Yellow	Black	Black	Red	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow
CSR	Green	Yellow	Red	Yellow	Red	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Black	Red	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow
Pirates	Red	Black	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red											
Miners	Yellow	Red	Black	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow											
Freelancers	Yellow	Red	Yellow	Red	Yellow	Black	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow									
Ravens	Yellow	Red	Yellow	Yellow	Black	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow											
Traders	Yellow	Red	Yellow	Yellow	Yellow	Black	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow											
Syndicate	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red												
Templars	Green	Yellow	Red	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Black	Yellow	Yellow	Yellow										
Rangers	Yellow	Red	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Black	Yellow	Yellow											
T & T Ltd.	Yellow	Red	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Black	Yellow											
SM Ltd.	Yellow	Red	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Black											

Green: Allies

Yellow: Neutral

Red: Enemies

Black: (same faction)

Dark Green: Subfaction (Allies, Cannot Change)

Part II.

# Storyline Characters

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## Marcus Rainier

(\*2045 - 36 years old by 2081)

Education: *Astrogeology*

Work history: *Miner, Surveyor, Geologist, Freelancer, Squad Leader*

Factions employed by: *FSRE, OmniCorp, EAC, Space Traders' Guild*

Physical characteristics: *Short brown-yellow hair, scar on the face, green/grey eyes, 186 cm tall, sporty figure, wide chest.*

Marcus received his education in the pre-solar event times, graduating two years before the Great Solar Event from McGill University in Canada. During his studies, Marcus already made a successful career during mining and geological operations on asteroids in the outer solar system, working as a freelancer for OmniCorp, FSRE and other corporations as well as neutral factions. Although there were strong ties between the Rainier family and the EAC, after the failure of Project Genesis and the death of Marcus' and Apollo's parents, both brothers developed a strong aversion to EAC and the world of politics in general.

Between the two brothers, Marcus is more hot blooded and less disciplined than Apollo. Marcus felt partly responsible for the death of their parents and tried to do his best to help his younger brother adapt to the new world emerging after the Solar Event. Thanks to his ties with FSRE and Apollo's skills and fervor for astrogeology and engineering, Marcus managed to get Apollo into one of the best educational facilities formed in the post-Event times – the FSRE; operated by New Greenbelt Military and Research College. Marcus is somewhat protective over his younger brother. Although proud of him and his achievements, Marcus admires him at the cost of his own safety and wellbeing.

**2068** – Graduated from McGill University (Astrogeology), age 23 years.

**2070** – The Great Solar Event occurs.

**2070-2074** – Apollo travels and works with Marcus, assisting him during mining and survey missions.



## Apollo Rainier

(\*2054 - 27 years old by 2081)

Education: *Military Engineering*

Work history: *Engineer, Surveyor, Pilot*

Factions employed by: *FSRE*

Physical characteristics: *Short dark brown hair, brown eyes, 188 cm tall, rather slim sporty figure, pale skin.*

The younger brother of Marcus, he shares the same background in the wealthy and influential Rainier family. However, while Marcus grew up mostly in the pre-solar event times and graduated at one of Earth's universities, Apollo was only sixteen at the time of the Great Solar Event. His brother took care of the rest of his education, taking him on mining and survey missions into the outer asteroid belts. At the age of 19, Apollo joined the newly formed Military Research College at New Greenbelt space station operated by FSRE (EAC).

Thanks to his young age during the Solar Event and his military training, Apollo is somewhat different from his brother – he thinks twice before acting and in general is the more responsible one of the two Rainier brothers. Most of his friends and companions from the College also have a different influence on him compared to Marcus' friends – most of whom are independent miners and freelancers.

**2070** – Great Solar Event occurs, while Apollo is age 16.

**2078** – **Apollo** graduates from New Greenbelt FSRE College at age 24.

**2081** – During the current time of Miner Wars 2081, Apollo is 27 years old.



### Madelyn Lloyd

(\*2051 – 30 years old by 2081)

Education: *Space Navigator*

Work history: *Navigator, Pilot, Operations Officer*

Factions employed by: *FSRE, OmniCorp, EAC, Space Traders' Guild*

Physical characteristics: *Long brown-black hair, warm brown eyes, 169 cm tall, sun tanned skin color, breast size B (14-16cm diameter).*

Madelyn embodies the term “good girl”. She is responsible, intelligent, well-educated and at the same time she is ready for any adventure – although a bit less adrenaline-mannered than the brothers. The Lloyd family was in close contact with the Rainiers, and while the latter were rather scientific and involved in political power circles before the Solar Event, the Lloyds were a family of high-ranking EAC military officers (although responsible for departments such as research, engineering and space exploration rather than battle operations). Madelyn first met the brothers in 2072, just two years after the Solar Event, when Apollo was just 18 years old and Marcus was raising him a taking him on missions for FSRE – on one outer belt asteroid geological survey mission, Madelyn was working as the fleet navigator, while Marcus was in charge of the operation. Suddenly she and Marcus fell in love with each other. However, the relationship was complicated by the career prospects aspired by both; while being sent on long missions, drills and contracts served to separate them. They broke up in 2076; nevertheless, both stayed in contact and got used to each other as a pilot/captain – navigator relationship. Madelyn also has a bit of a motherly approach with respect to Apollo. She is the most responsible one out of the three and tries to keep the brothers on a leash when they tend to be too stubborn and hot blooded.

**2070** – The Great Solar Event occurred while she was age 19.

**2072** – Madelyn meets the Rainier brothers on a mission (although they knew each other from childhood years, since their families often mingled).

**2081** – During the current time of Miner Wars 2081, she is 30 years old.

Part III.

# Technology

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## Interactive Media and Entertainment

Interactive media and entertainment saw rapid changes in the late 20<sup>th</sup> and into the 21<sup>st</sup> century. Massive releases of extremely high-tech interactive media titles (for simplicity called next-gen games) recruited and satisfied hundreds of millions of gamers in the 1980's and 90's of the 20<sup>th</sup> century. The game industry spread even further, surpassing popularity of the Hollywood film industry. The first half of the 21<sup>st</sup> century was a battlefield of virtual avatars and integrated augmented reality simulation systems, putting gamers into immersive virtual worlds with almost infinite possibilities.

Apart from the rise and spread of digital and virtual gaming, classical forms of entertainment still held the top spot: clubs, bars, casinos as well as sports. With the arrival of cyber implants, traditional sports offered great new possibilities for professional athletes, allowing them the ability to jump higher, run faster, visualize infrared light/heat waves, etc. Additional news and technologies were still in development. Sports leagues soon had to separate matches into non-augmented and augmented. While the latter offered a completely new experience for both the player and the viewer, the former traditional type benefited on more natural and skill based forms of sport. Both types of sporting events attracted similar ratings and fan base numbers, even though the boom of brand new cyber technologies was still in its infancy.

Many new technologies followed; however, those existing remained and were also supported— There were still radio channels like back in the first half of the 20<sup>th</sup> century, although these broadcasts were unilaterally available as streamed podcasts over the internet. There were also both traditional 2D and newer 3D TV channels, although full 360° virtual reality holographic vision and sensation soon became possible. People were still going to pubs, nightclubs and enjoying brothels, although many attractive forms of virtual leisure entertainment and activities eventually became possible with the emergence of advanced virtual and cyber space hardware and software.

The pubs, casinos and space bars were simply part of the daily lifestyle. Of course, it was always possible to meet almost anyone in any of the virtual networks over great distances as well! However, especially due to the desire to remain secure and anonymous to the on-line community, people kept their social instincts and met others on a personal basis for a beer or live concert somehow attracted human spirit.

## Enhancements and Stimulants

### Celeritas (Concentration and Alertness Drug)

Prescribed purpose is to increase energy, concentration and alertness, general physical and mental activity.

**Application:** Injection, Ingestion

**In-game effects:** Gives the player the ability to alter real time and in effect cause the game play to appear in slow-motion. As a result, the pilot will achieve increased sensual, mental and physical energy and achieve more tasks and less time, for the player this means the game is switched into slow-motion and they have more time to react, evade etc. The use may be effective in combat situations, the effects last for a couple of minutes, after which the pilot loses some health. This also affects control of the ship in a favorable sense, simplifying the flight experience, allowing auto-leveling and potentially reduces vertigo. Possible risk is addiction and depleted energy levels if used often.

**Intended use:** To be used in especially difficult maneuvering or combat situations where evading enemy shots and fighting against superior enemy arises.

### Ocustamin (Vision Enhancement Drug)

Prescribed purpose increases mental capabilities of the subject, and is especially connected with visual perception.

**Application:** Ingestion

**In-game effects:** A special glow/aura or marker appears around moving objects of significance (ships, cargo, missiles). This may also include infrared sight or improved vision under especially dark conditions (i.e. exploring an asteroid without reliance on headlights—during an ambush). No addiction risks. The effect lasts for several minutes, after which the pilot loses some energy/health.

**Intended use:** To be used in ambush missions with low light and/or intense combat situations where the best performance is required.

### Cruor (Painkiller)

Prescribed purpose allows for temporary invulnerability to pain and health loss.

**Application:** Injection

**In-game effects:** The player's health is temporarily "frozen" for the duration of the application. If any further health loss occurs, the result of use prevents the pilot from dying or passing out. When the effect begins to wear off, the player consequently starts losing health dramatically and requires eminent medical treatment (Subject will eventually lose all health which the drug prevented plus some additional health loss due to use of the drug). There is also an inherent risk of addiction.

**Intended use:** During especially intense combat situations when the pilot is hit with rapid projectile rounds but still needs to finish the skirmish intact (or during dangerous mining operations, where exposure to radioactivity is involved).

#### **PSCPD/A (Protein Specific Control Poison Drug / Antidote)**

The subject of the toxin becomes highly addicted to the specific protein substance induced. Once injected, into the bloodstream, the subject requires additional small doses every 6 hours to survive.

**Application:** Injection (first use), Ingestion (later use, smaller antidote doses)

**In-game effects:** The target endures serious physical and mental suffering and health loss (eventually leading to internal hemorrhaging) in case he doesn't take an antidote regularly. The substance is primarily used for mass slave control. Once the slaves (war captives) are injected with the PSCP-substance, they require antidotes in regular intervals to survive and only the poison's original manufacturer is able to process the PSCP-Antidote.

#### **Star Dust**

"Star Dust" became a phenomenon during the early 2030's. The drug has strong psychedelic effects, causing altered perception of reality in colors, field of depth, audible frequency range, hallucinations and increased mental and imaginary projection abilities. The usage induces the human body to release otherwise dormant hormones and neurotransmitters, leading to an overall harmonious mental state which results in increased mental perception and physical regeneration of all sensory organs. Side effects include increased vigor and libido and prolonged stages of heightened awareness. Long term users report "eternal youth" as one of the effects of the drug, since it is able to prolong the life expectancy dramatically (average life expectancy of Star Dust users is 93.6 years compared to 76 years for non-users according to published research conducted in 2051). The substance is, however, extremely addictive – surpassing addictive dependency levels of other notorious habitual substances, such as caffeine, nicotine and even heroine. Further reports indicate that there is no casual case, one-timer user of this drug – either someone has tried and become a "Duster"... or one has not. Subject has to take one dose every few days, depending on the severance of his addiction. The issue of Star Dust is highly controversial, since apart from the extremely high addiction issue, no negative side effects of the drug were ever reported and all medical researches show significant positive health effects. It has been lab tested only on terminally ill patients as a last resort, in an attempt to ease the suffering and conduct further research.

**Application:** Injection, Sniffing.

**In-game implementation:** The substance is a commonly traded on the black market and typically receives the highest demand and market potential. However, it is considered illegal in all major factions except the Fourth Reich, whose political, military and research leadership soon became addicted to the use of Star Dust and legalized its use within their territory. Fourth Reich is thus also the main producer of the synthetically produced Star Dust substance.

### Aphrodite Pills

A non-addictive stimulant, which is a strong aphrodisiac with empathogenic effects.

**Application:** Ingestion.

**In-game implementation:** Important trade article. The highly efficient aphrodisiac is commonly used despite its high price in higher society circles since its discovery in 2043.

### Tobacco (Nicotine)

Highly addictive substance, stimulant.

**Application:** Smoking, snuffing, chewing.

**In-game implementation:** The drug is a very common trade article in the legal market. About 20% of the population is frequently using the product, putting cigarettes and cigars among the most commonly traded goods.

### Alcohol (Ethanol)

Addictive substance, sedative, social drug.

**Application:** Ingestion.

**In-game implementation:** The drug is a common trade article in the legal market. About 80% of the population frequently consumes alcoholic beverages.

## Equipment

### Engines

For the test use in spacecraft, three main types of engines are commonly used and built: Chemical, Electrical and Nuclear. Chemical engines are powered by exothermic reactions (usually involving oxidation) of the propellant (fuel). They tend to be the cheapest type to implement, but require a specific fuel to be bought or manufactured and carried aboard the ship in large quantities. This is complicated by the high potential for an internal explosion upon collision during mining or combat operations. Electrical engines are the safest and easiest to use. However, the produced power efficiency is generally the lowest of any type.

One advantage is the ability to share the energy from the ship's main power circle, thus eradicating the necessity to acquire and carry specific fuel. Nuclear engines are the most expensive and efficient types in terms of power output as well as the ratio of the amount of fuel rods required to supply prolonged usage. However, nuclear fuel is (apart from the black market) difficult to buy without a specially obtained license and the same applies to the difficulty of finding nuclear engines themselves.

#### Engine types:

- **Electrically powered (Electrostatic Ion thruster)**
  - Power source / fuel: Xenon (found in uranium and plutonium voxels) + electricity.
  - High consumption of electricity, xenon is consumed only a little.
  - Note: Electric thrusters typically offer much higher initial impulse; however, due to practical power source constraints sustained thrust is weaker compared to chemical thrusters by several orders of magnitude.
  - After explosion, immediate area is polluted by radiation for few minutes.

Name	Force	Weight	Fuel consumption	Electricity consumption
EL 1	1000	2000 kg	0,01 liter / hour	100 kW / hour
EL 2	1300	2500 kg	0,01 liter / hour	130 kW / hour
EL 3	2000	2800 kg	0,01 liter / hour	200 kW / hour
EL 4	2500	3000 kg	0,01 liter / hour	270 kW / hour
EL 5	5000	3800 kg	0,01 liter / hour	410 kW / hour

- **Chemical powered**
  - Power source / fuel: Helium, no electricity needed.

Name	Force	Weight	Fuel consumption	Electricity consumption
CH 1	3000	1500 kg	1 liter / hour	no
CH 2	3500	2100 kg	1,2 liter / hour	no
CH 3	4000	3000 kg	2 liter / hour	no

CH 4	5000	3200 kg	3 liter / hour	no
CH 5	5500	4000 kg	4 liter / hour	no

- **Nuclear powered (Nuclear thermal rocket)**
  - Power source / fuel: Uranium, no electricity needed

Name	Force	Weight	Fuel consumption	Electricity consumption
NU 1	4000	3000 kg	0,1 liter / hour	no
NU 2	4500	3500 kg	0,2 liter / hour	no
NU 3	5500	5800 kg	0,3 liter / hour	no
NU 4	6200	7000 kg	0,35 liter / hour	no
NU 5	8000	8800 kg	0,4 liter / hour	no

### Asteroid Materials and Mining

Most of the asteroids commonly encountered typically contain multiple kinds of useful ores. All major factions conduct mining on asteroids for raw materials used in the construction of ships, habitats and production of industrial machines and equipment. The post-Solar Event economy is thus dependent on large scale mining operations on asteroids within our Solar System. Although large proportions of the asteroid mass are just some kind of granite or limestone, which are of no economic and industrial use, you can find veins of various ores and even precious materials within. Some of the ores found on asteroids may include Iron, Silicon, Nickel, Cobalt, Magnesium, Silver, Gold, Platinum, Uranium and others.

Name	Price per 1 voxel harvested	Endurance	Weight in 1 voxel	Harvesting speed
Stone	No, can't harvest	Medium	No	No
Iron	\$500	High	7800 kg	Medium
Uranite	\$400,000	Small	19500 kg	Slow
Helium 3	\$10,000	Small	100 kg	Fast
Helium 4	\$10,000	Small	100 kg	Fast
Ice	\$10	Small	1000 kg	Fast
Gold	\$100,000	Small	30,000 kg	Medium
Silver	\$70,000	Small	20,000 kg	Medium
Indestructible	No	Indestructible	No	No
Silicon	\$50	Medium	4000 kg	Medium
Platinum	\$85,000	Medium	30,000 kg	Medium
Nickel	\$400	High	6000 kg	Medium
Cobalt	\$300	High	6500 kg	Medium
Magnesium	\$400	High	1500 kg	Medium

### Drills and harvesting tools

Several mining methods were developed and tested through the years. Over time only a couple of them proved to be efficient enough for wide scale commercial use. Apart from frequent use of explosives, which are sometimes unreliable, unpredictable and downright dangerous to use, drills are the most

commonly used method for effective mining operations. They enable the operator to surgically cut their way through dense, otherwise impenetrable materials and offer easy manipulation when accompanied by harvesting devices.

Most commonly used are crusher drills (rotating head with rows of “teeth”), pressure drills (piercing the asteroid walls by using high pressure points on specific sections of the wall), thermal drills (essentially melting the ores and stone) and laser drills (severing precise portions of the wall into pieces). Drills may be powered electrically or may have their own (most often nuclear) engine, independent from the ship’s main power circuit. Harvesting is subsequently conducted using some of the existing harvesting devices and storing the resources in the cargo module of the craft.

### **Solar Wind Impacts and Technologies**

Since the Great Solar Event disturbed the integrity of the processes of nuclear fusion within the sun, the strength and range of usual solar winds has increased rapidly and keeps causing severe problems to unprotected (i.e. not hidden within asteroids) space stations as well as space craft. Intense solar winds now extend even as far as the asteroid belts of Jupiter and Saturn and although their turbulent intensity is marginal at such distances, the resulting radiation they propel still poses a significant health threat to international trade, transportation and mining operations. It also results in the increased cost of building safe habitats and general protective construction.

In 2072, Advanced Solar Armor Plating was developed; however, due to extensive cost, it is being widely used only on larger commercially owned space stations, which would otherwise be vulnerable to sun winds. Smaller stations and outposts use a cheaper method of solar wind protection; entrenching their facilities directly into the asteroids themselves and thus benefiting from the natural protection they offer. There are serious side effects from even short term exposure to solar wind radiation on unprotected living organisms and unless the ship cabin is protected with specially treated armor or other kind of (lead) shielding, the pilot may suffer serious health risks.

### **Nano Repair Kit**

Advancements in the fields of nanotechnology, robotics and micro-fabrication brought a new and quite efficient method of space craft repair systems while in deep space operations, far from standard repair facilities. AI controlled microscopic robots are deployed, wirelessly operated by the ships computer and supplied with necessary instruction sets needed to fulfill the necessary tasks on various dependent devices. Nanobot repairs consume ship energy and deplete specific power cells, so the repairs conducted are not without limitation.

### **Weapons**

The 20th and 21st centuries were the stages and testing grounds for hundreds of new deadly and highly efficient weaponry. Mankind could easily have destroyed itself multiple times over using the atom-splitting arsenal it had developed from the end of the Second World War. Countries were arming themselves rapidly and more nuclear superpowers were emerging. United States, Russia and soon many others followed. The international committees were trying to restrict or at least limit nuclear arming,

pointing to the senseless long term environmental destructive consequences of a potential Third World War, which, luckily didn't happen - at least until the catastrophe of the Great Solar Event, which proved to be much more destructive than anything humankind could imagine before. The resulting new world and new possibilities within brought us into real universal war - factions were struggling for power, production capacities, scientific advantage and - last but not the least - existence.

The Second Space Race in the 21st century brought with it the emergence of new technologies and weaponry, suitable for spacecraft, battle cruisers and their offensive and defensive capabilities. Most impressive was the development of missile array systems, offering a variety of means for aiming and tracking multiple targets simultaneously. Great distances in space and the dangers hidden within required a new breed of weaponry to be produced; from remote controlled to sonic velocity missiles. The ship armor continually improved as well, auto aiming systems were upgraded, and explosive nuclear charges were becoming more common. The science of survival brought us completely new composite materials and the arms race was seemingly never-ending, as new technologies emerged.

Technically, the planetary arsenal didn't change much compared to late 20th century. The scope of possibilities were almost identical, only the weaponry deployed for use in outer space received several adjustments, tweaks and hacks – mainly because of the different physical qualities of the non-atmosphere and zero-gravity environment. Missiles, machine guns, cannons, lasers... and some more recent technologies were developed specifically for spacecraft defense systems - EMP, high-energy plasma projectors, torpedoes, intelligent mines...

**Laser/Energy/Particle guns:**

Name	Ray radius	Weight	Color	Firing rate	Price	Electricity consumption
Laser Cannon	Point	500 kg	Blue - green	No rate because laser shoots in one continuous stream	\$100,000	
HEL Cannon (High Energy Laser Canon)	Point	700 kg	Blue - green	120 per minute	\$130,000	
Ion Cannon	30 cm	840 kg	Red	120 per minute	\$210,000	
Radiation Ray	1 m	300 kg	Green - yellow	60 per minute	\$350,000	

**Conventional weapons:**

Name	Weight	Firing rate	Caliber	Price
Automatic Rifle With Silencer	130 kg	120 per minute	15 mm	\$20,000
Sniper	80 kg	60 per minute	15 mm	\$70,000
Auto-cannon	200 kg	600 per minute	20 mm	\$15,000
Machine gun	130 kg	240 per minute	20 mm	\$10,000
Shotgun (Flak cannon)	50 kg	120 per minute	60 mm	\$20,000
Cannon	400 kg	30 per minute	120 mm	\$25,000
Guided Missile launcher	300 kg	30 per minute	130 mm	\$40,000
Universal Launcher	400 kg	30 per minute	30 mm	\$30,000
Rail gun	500 kg	120 per minute		\$50,000

**Dying & ship damage:**

- When a player's health is zero but ship isn't really damaged, other people can steal resources from it for 60 seconds. Player is re-spawned.
- When the player's ship explodes, it kills the player and no-one can steal from it
- When the player's ship engines are damaged to the point where they no longer function, the ship can't be controlled directly and another player can steal from it for 60 second. However, the player has the option to use the suicide button preventing further looting.

**Devices (not visible as 3D models, but affecting ship's functionality or player's life):**

Name	Description	Price	Weight	Cargo slots
Rear camera	Render rear camera in right-top corner only if this device is present in cargo container. In future releases it will be vulnerable to damage and if	\$1,000	30 kg	1

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	damaged, it will not function properly and will flicker			
Laser pointer		\$2,000	50 kg	1
Auto targeting	Automatically targets all weapons to the point where cross-hair is pointed – of course, only in certain range.	\$10,000	30 kg	1
Night vision	Night vision working in active mode – emitting waves, but can't be detected because each has its own frequency. Rendering is through new shader so it appears in grey-scale palette.	\$8,000	100 kg	1
Nano Repair Tool	Automatically repairs a ship; 1% damage per second. It has one parameter – remaining % of full.	\$500,000	200 kg	1
Med kit	Automatically heals player, 1% per second. It has one parameter – remaining % of full.	\$500,000	150 kg	1
X-RAY	Can detect outlining signatures of objects through solid mass. Range is 100 meters. Will be implemented in future. Can also be used to scan contraband.	\$300,000	300 kg	1
Anti-radiation medicine (Deuterium-depleted)	Similar to med kit, but protects only against radiation	\$30,000	1 kg	1
Radar jammer	Blocks all radar transmissions in its proximity, even friendly radars, so player won't distinguish friend from enemy. Range: 500 meters	\$150,000	1000 kg	3
Performance enhancing medicine	Decrease oxygen consumption to 50%; Has parameter that defines how many seconds will it last; (it has no unlimited capacity)	\$10,000	5 kg	1
Health enhancing medicine	Doesn't heal, but decreases negative changes on health status to 50%. Basically it makes it harder to decrease your health; (it has no unlimited capacity)	\$20,000	5 kg	1
Extra fuel container	Uses same fuel type as ship's engine. Extends its storage by 100%. (it has no unlimited capacity)	\$10,000	40 kg	5
Extra electricity container	Extends its storage by 100%. (it has no unlimited capacity)	\$15,000	300 kg	5
Extra oxygen container	Extends its storage by 100%. (it has no unlimited capacity)	\$8,000	90 kg	3
Oxygen converter	Converts ore that contains oxygen into pure oxygen, therefore player can resupply oxygen on	\$56,000	230 kg	5

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	the fly.			
Fuel converter	Converts ore that contains fuel into pure fuel, therefore player can resupply fuel on the fly. Works always with the type of fuel engine has.	\$130,000	670 kg	10
Solar panel	When sun rays strike on a ship, electricity gets recharged by 10 kW / minute.	\$34,000	80 kg	1
Booby trap	A bomb that explodes 10 seconds after player dies. Its purpose is to scuttle a drifting unmanned ship prevent looting.	\$10,000	100 kg	2
Sensor	Set it at the entrance of a tunnel system, and it notifies you whenever a friendly or enemy passes nearby it. Very small, and undetectable by radar.	\$20,000	30 kg	1
Remote camera	Sends video and audio output to you. Can be detected by other players or enemies. Works only in current sector.	\$20,000	50 kg	1
Remote camera on drone	Same as "Remote camera" but this one is mounted on a drone so you can fly with it.	\$30,000	120 kg	2
Alien-object detector (in game called as "AO detector")	This is not exactly a device. It's just an item that player can transport in his cargo container. He can't buy it; he can only get it from his FSRE faction. Purpose of this object is to aid in locating alien objects.	No	2000 kg	8

### Transferring items:

- Any two ships can transfer items between each other:
  - Friend to friend
  - Enemy to enemy
  - Friend from dead friend
  - Enemy from dead enemy
- First step is to select what they want to transfer, then they click OK
- Second step is looking at progress bar with the actual transfer; if canceled while in progress, nothing gets transferred and whole transfer operation is aborted (e.g. if someone attacks while two ships are in transfer)
- Items that can be transferred:
  - Everything in cargo container (e.g. ammo, devices, ...)
  - Oxygen
  - Fuel – if compatible
  - Electricity
  - Weapons

**Engines ON/OFF:**

- When engines are off, but electricity is on -> sound simulator, HUD, radar, etc. are still active
- When electricity is off, engines must turn off too
- When engines are off and electricity is off, basically nothing except oxygen mask works

**Electricity**, supplies power for the following:

- Sound simulator
- HUD
- Computer
- Radar
- Weapons
- All accessories or devices (e.g. laser pointer)
- Engines (in cases of electrically powered)

**External sounds simulator:**

- Enabled only when electrical power remains or when electricity is on.
- Simulates otherwise inaudible audio cues that occur outside of the cockpit (explosions, foreign engines, etc.).

**Weapons:**

- Can be placed on left or right side of a ship, in various vertical rows.
- Drill device and harvester tube are generally not considered weapons and can be mounted only on ship's front underside.

**Armor:**

- Ship can use only one armor type at the moment, no armor combinations are allowed

Name	Description	Resistance	Price	Weight
Basic		+20%	\$10,000	1000 kg
Advanced		+50%	\$30,000	2000 kg
High Endurance		+100%	\$60,000	3000 kg
Solar Wind	Protection against solar wind. Ships wearing this armor can fly in solar wind without problems and as long as they want. But it has no protection against projectiles/explosions	0%	\$90,000	2500 kg

**Radar:**

- Player always sees this on his radar (no matter what detection unit he has installed):
  - Friendly ship locations, his mother ships and stations
  - Mission objectives
  - Important locations

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- Sun
- Radar doesn't work well in certain situations:
  - No electricity
  - Solar wind around the player (even if the player is hidden)
  - In jammer's range
- Displays enemies and ore depends on installed detection unit:

Name	Description	Range	Price	Weight
Engine detector 1	Detects engines actively turned on, all types.	500m	\$50,000	300 kg
Engine detector 2	see above	2000 m	\$150,000	400 kg
Movement detector 1	Detect large moving objects, not only ships.	600 m	\$70,000	200 kg
Movement detector 2	See above	2100 m	\$120,000	220 kg
Radar detector 1	Detects all active radars	300 m	\$30,000	120 kg
Radar detector 2	See above	1300 m	\$50,000	130 kg
Ore detector for X 1	X means voxel material – each material will have its own special detection unit	200 m	\$80,000	300 kg
Ore detector for X 2	See above	350 m	\$190,000	1000 kg
Pulse detector	Universal detector, for all types. With extreme range, but works only in pulses. Once per 10 seconds or when player presses a key. Detected positions are remembered and don't change until next pulse.	10,000 m	\$300,000	2000 kg

### Weapons:

- Mounting – Specific locations on craft where weapons are mounted
  - Left/right wing - Guns, missile launchers, etc. can be also mounted in twin-mode on left and right wing
  - Middle / Under cockpit – drill or harvesting tube
- Types:

Name	Description	Weight	Firing rate	Caliber	Price
Automatic Rifle With Silencer	Interchanging round types	130 kg	120 per minute	15 mm	\$20,000
Sniper	Various caliber	80 kg	60 per minute	15 mm	\$70,000
Auto-cannon	Gatling gun	200 kg	600 per minute	20 mm	\$15,000
Machine gun	Various caliber	130 kg	240 per	20 mm	\$10,000

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			minute		
Shotgun (Flak cannon)	Shoots shrapnel's, rounds	50 kg	120 per minute	60 mm	\$20,000
Cannon	Explosive projectiles	400 kg	30 per minute	120 mm	\$25,000
Guided Missile launcher	Detection depends on missile type (see ammo table)	300 kg	30 per minute	130 mm	\$40,000
Flamethrower	Implement in future MW release; First find out how something can burn in space	200 kg	Doesn't shot particles; Range is 30 meters;		
Universal Launcher	For launching various projectiles or items	400 kg	30 per minute	30 mm	\$30,000
Rail gun	High velocity round propelled by electro-magnetic impulse)	500 kg	120 per minute		\$50,000

**Ammo:**

- Each ammo type works only in specified weapon
- Range – distance after which the projectile or missile disappears; in meters
- Velocity – usually muzzle velocity of a projectile; in meters per second
- Health damage – percentage of player's health affected
- Armor damage – percentage of damage to armor
- Ship damage – percentage of damage to ship
- Weight – mass of one projectile/missile/round, usually in grams
- Voxel damage - deformation of voxel map. Parameter is radius in meters
- Ammo box capacity - how many projectiles can be stored in one standardized ammo box
- Kinetic force – related to motion caused when projectile hits it
- Price – cost per one projectile/missile/round
- Types:

Name	Range	Velocity	Health damage	Armor damage	Ship damage	Voxel damage	Weight	Ammo box capacity	Kinematic force	Price
Automatic Rifle With Silencer – High Velocity Ammo	2000	1000 m/s	1	1	1	No	50 g	300	?	\$1
Automatic Rifle With Silencer – SAPHEI (semi-armor piercing high explosive incendiary) ammo	1800	900 m/s	2	2.5	2	No	80 g	150	?	\$1.8
Automatic Rifle With Silencer – BioChem ammo – <i>small infrastructure damage but high human damage</i>	1500	900 m/s	3	1	1	No	150 g	50	?	\$2.5

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Sniper - High Velocity Ammo	4000	4000 m/s	2	2	2	No	80 g	120	?	\$3
Sniper - SAPHEI (semi-armor piercing high explosive incendiary) ammo	3800	3500 m/s	4	4.5	4	No	100g	80	?	\$3.5
Sniper - BioChem ammo – <i>small infrastructure damage but high human damage</i>	3200	2000 m/s	3	1	1	No	150 g	50	?	\$4
Auto-cannon – basic ammo	2800	2000 m/s	1	1	1	No	60 g	300	?	\$0.5
Auto-cannon – high velocity ammo	3000	3000 m/s	1.5	1.5	1.5	No	80 g	250	?	\$0.75
Auto-cannon – APIA - armor piercing incendiary ammo	2500	2000 m/s	2	2.5	2	No	100 g	200	?	\$1
Auto-cannon –SAPHEI (semi-armor piercing high explosive incendiary) ammo	2200	2000 m/s	2.5	2.5	2.5	No	120 g	200	?	\$1.5
Auto-cannon – BioChem ammo – <i>small infrastructure damage but high human damage</i>	1800	1000 m/s	3	1	1	No	140 g	100	?	\$3
Machine gun – basic ammo	2300	1700 m/s	1	1	1	No	60 g	300	?	\$0.5
Machine gun – high velocity ammo	2500	2200 m/s	1.5	1.5	1.5	No	80 g	250	?	\$0.75
Machine gun – APIA - armor piercing incendiary ammo	2100	1900 m/s	2	2.5	2	No	100 g	200	?	\$1
Machine gun –SAPHEI (semi-armor piercing high explosive incendiary) ammo	1900	1900 m/s	2.5	3	2.5	No	120 g	200	?	\$1.5
Machine gun – BioChem ammo – <i>small infrastructure damage but high human damage</i>	1600	900 m/s	3	1	1	No	140 g	100	?	\$3
Shotgun – Basic ammo (cone 30 degrees)	1000	600 m/s	0.5	0.5	0.5	No	50 g	150	?	\$1
Shotgun –High velocity ammo (cone 30 degrees)	1300	1200 m/s	0.8	0.8	0.8	No	60 g	120	?	\$1.5
Shotgun –SAPHEI - Explosive ammo (cone 40 degrees)	1000	700 m/s	1	1	1	No	100 g	80	?	\$2.5
Shotgun – APIA - Armor Piercing ammo (cone 30 degrees)	1000	800 m/s	1	1.5	1	No	100 g	90	?	\$2
Cannon – Basic Ammo	3000	2000 m/s	3	3	3	5 m	7 kg	4	?	\$30
Cannon – High Velocity Ammo	3500	3000 m/s	5	5	5	10 m	9 kg	3	?	\$40
Cannon - APIA – Armor Piercing Incendiary Ammo	3000	2200 m/s	5	7	5	10 m	10 kg	4	?	\$50
Cannon - SAPHEI (semi-armor piercing high explosive incendiary) ammo	3000	2200 m/s	8	10	8	10 m	10 kg	4	?	\$50
Cannon - Proximity Explosive ammo – <i>explodes in 5 meter proximity to any non-voxel object, but also if it collides with anything. Explosion throws small shrapnel's into all directions.</i>	1000	1000 m/s	5	5	5	8 m	15 kg	4	?	\$90
Cannon -Tunnel Buster ammo - <i>Projectile hit's voxels, penetrates 2 meters inside and then explodes. Result is bigger hole.</i>	2000	2500 m/s	6	6	6	15 m	20 kg	3	?	\$100
Guided Missile – Visual Detection Projectile – missile targets visually. When target disappears, missile continues in original trajectory.	3000 m	800 m/s	6	6	6	10 m	20 kg	3	?	\$500
Guided Missile – Engine Detection Projectile – targeting and navigation works while target engine is on	3000 m	800 m/s	6	6	6	10 m	20 kg	3	?	\$200
Guided Missile – Radar Detection Projectile –	3000	800	6	6	6	10 m	20 kg	3	?	\$200

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targeting and navigation works while target radar is on	m	m/s								
Universal Launcher – Sphere Explosive	500 m	5 m / s	12	12	12	20 m	30 kg	3	?	\$100
Universal Launcher – Directional Explosive – explosion has tube/capsule shape	500 m	5 m / s	12	12	12	20 m / 10 m	30 kg	3	?	\$100
Universal Launcher – Time Bomb – explosion has sphere shape but is triggered by a timer	100 m	5 m / s	9	9	9	20 m	30 kg	3	?	\$120
Universal Launcher – Remote Bomb – explosion has sphere shape but is triggered by a remote controller	100 m	5 m / s	9	9	9	20 m	30 kg	3	?	\$130
Universal Launcher – Asteroid Killer	500 m	5 m / s	20	20	20	50 m	100 kg	1	?	\$250
Universal Launcher – Mine Smart – looks for enemies in 50 m distance, moves to them and explodes	50 m	5 m / s	5	5	5	10 m	10 kg	5	?	\$100
Universal Launcher – Mine Basic – explodes only if something collides with it	-	5 m / s	5	5	5	10 m	12 kg	5	?	\$300
Universal Launcher – Gravity Bomb – sucks all objects	100 m	5 m / s	-	-	-	-	100 kg	1	?	\$1000
Universal Launcher – Hologram – fools all radar detection units; projector is destructible, but holographic projection is not; Lives for 5 minutes;	20 m	5 m / s	-	-	-	-	30 kg	3	?	\$10,000
Universal Launcher – Decoy Flare – fools guided missiles – all types; <a href="http://www.youtube.com/watch?v=hBYlsth2ms">http://www.youtube.com/watch?v=hBYlsth2ms</a>	100 m	100 m / s	-	-	-	-	10 kg	10	?	\$1000
Universal Launcher – Flash Bomb – flash that blinds all players including those who fired it	20 m	5 m / s	-	-	-	-	10 kg	5	?	\$500
Universal Launcher – Illuminating Shell – omnidirectional light	20 m	5 m / s	-	-	-	-	5 kg	10	?	\$100
Universal Launcher – Smoke Bomb – smoke starts 1 second after launched; Lives for 1 minute;	20 m	5 m / s	-	-	-	-	10 kg	3	?	\$200
Universal Launcher – Remote Camera – player can control orientation, but not position; Transmits video and audio up to 10 km distance; Can be detected by “Radar detection unit” type radar	20 m	5 m/s	-	-	-	-	100 kg	1	?	\$2,000
<b>Rail gun ammo – highest velocity possible</b>										

### Antigravity field generators

The effects of zero gravity on living organisms were well known since the early beginnings of space colonization. Short term stay was possible, even for space tourists without any previous training on zero-G simulators. However, staying in space for more than a few days required specific discipline, training, diet and wearing special suits and equipment to keep the body in a fit condition. The scientists had to look for new horizons if we were to colonize the vast reaches of space.

During these many years of research hundreds of leading scientists and technicians worked almost exclusively on antigravity field generators, based on the internal laws of particle quantum physics. The concept was theoretically possible but, practically speaking, we had nothing – at least until 2021, when the first successful results were presented at the World Scientific Conference. There, an antigravity field

was designed and generated within a small, isolated metal cube. That was the first step and the next leap soon followed as the corporate sector brought investments into this new business opportunity. Shortly thereafter in 2026, mass production of the first series of space craft capable of carrying multiple occupants into space with artificial gravity began. During the '30s, the greatest boom of space colonization gave birth to the rise of real space industry, with a budget that surpassed both the military and IT sectors combined. The rest of the 21st century was in the shadow of those achievements, enabling humans to live long term in space while enjoying the comfort and amenities similar to that of mother Earth.

### Food, water, fuel

Resources and supplies were not a problem until after the Solar Event. Especially during the second half of the 21st century, abundant sources of life-sustaining elements were on the rise. New biotechnologies increased the food production capacities of the Earth and although famine and hunger was still present, (thanks to international politics and social injustices), there was, at least based on hard figures, more than enough for everyone. The mineral resources mined on asteroids were also a great advantage for mankind as the space mining facilities rose greatly after major efforts in the '30s. Human rights activists and environmentalists soon achieved their common goal: a worldwide ban of mining and drilling operations on Earth, in order to preserve the natural conditions therein.

This presented a new challenge of finding new sources of clean and abundant energy. The traditional sources were not good enough, presented environmental risks and we needed more than our old methods could keep up with our continued lust for the spoils of industry - even more strongly then, as the space industry and mining operations grew in size and scale. Foundries, laboratories, new integrated IT systems and "cyberlabs" needed immeasurable amounts of energy that we didn't have and seemingly couldn't manage to obtain using traditional methods. That hunger for more energy was the first impulse and perhaps the most important economic and political justification for beginning research on Project Genesis.

Ultimately the same greed that fed the desire for an unlimited energy source turned on us once again and consumed us. Somehow we survived, but were reduced to conditions several levels below the state of 2070. There was almost nothing left - at least in terms of even the most basic luxuries we had grown so used to. The social gap widened, the food and water supplies from the Earth were at once lost and we had no choice but to prey on others. The resources were there, but were collected and controlled by political powers with their own agenda. The first few years after the Solar Event brought us unthinkable radicalization in politics, and with it laws limiting consumption for individuals, families, and similar laws controlling many aspects of human life. Most surrendered to this new world order, some refused and formed their own movements or lived their lonely lives as miners, freelancers and mercenaries. The only sources of water became efficient recycling or mining for ice crystals on the asteroids and comets. The

air was simply extracted therein, being probably the easiest vital resource to acquire - assuming one had access to the water. The greatest problem, and soon a trade article as well, became food.

Back in the '50s and '60s, many methods for synthesizing artificial food production using nanites were introduced, and though they were now our only source of food, they were expensive and inefficient. As the economy during the 70's re-stabilized, additional organic bio-domes were built, and at least the higher classes of our society could afford real food. Still, there was simply not enough and many struggles, political as well as domestic, ensued.

Artificial production technologies became one of the most important fields of research. It was still a rather uncomfortable path, but the goal was clear: to establish sufficient natural food production. That, however, would require cooperation and undisturbed growth of the society and industry. This kind of peace was never possible in post-Event society. We had little and were still destroying and stealing from each other.

## Solar Wind

Extreme solar wind eruptions are the result of project GENESIS. Solar wind contains high concentrations of radioactive energy particles which are lethal to humans. Only advanced shielding can offer protection. And only large mother ships and space stations use this shielding. Cities built into asteroids are shielded as well.

Small ships controlled by a player are absolutely not protected against solar wind and if hit, the player's health will drop significantly due to radiation. The ship itself will take considerable damage as well.

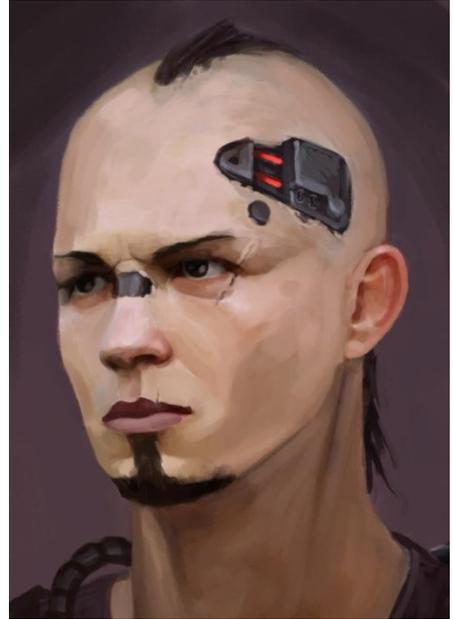
Solar wind is most powerful and dangerous near the sun. Also intervals are most frequent there. Strength and interval decreases exponentially with the distance.

## Solar System

- In MW, player can travel only between the Sun and Saturn. He can't go further, out of the solar system.
- Over 300,000 asteroids have been identified.
- Most asteroids are far from the Sun. The main asteroid belt is roughly 2 to 4 times further from the Sun than Earth. This means that the available solar energy (solar constant) is 4 to 16 times less, although building large reflectors to collect sunlight is possible in space.
- Many asteroids may merely be loose clusters of dust and rocks, which may be very difficult to use.
- Smaller objects may collide with the asteroid and cause significant damage.

## Cybernetic Implants and Nanotechnology

The early 21<sup>st</sup> century has shown immense advancement in prosthetics – starting with artificial limbs as medical replacements for amputees and continuing with additions to human subjects, giving humanity a glimpse of superhuman abilities. During the '40s and '50s, several augmentation technologies were developed and widely spread, allowing the connection of computers (and other electronic devices) with the human brain, enabling enhanced control and improved performance. Most of the technologies were legal and promised great business opportunities for their researchers and manufacturers. Many “cyberlabs” (or also Augmentation Clinics) were founded – a sequel to 20<sup>th</sup> century plastic surgery clinics, offering a wide range of “beneficial body” modifications. Some humanists, naturalists and religious speakers protested, but aside from some dangerous adjustments, (mostly hacked military technologies), the science and art of augmentation flourished and becoming widely popular due to overwhelming acceptance by public and massive commercial campaigns.



Side effects on some individuals included depression, psychotic behavior and loss of motivation, but most of the augmented individuals claimed the implants and adjustments improved their overall performance, abilities and quality of life. Over decades, the market had to offer more and more augmentations and their efficiency increased. Modules for wireless connection of human brain directly transmitted to a computer, strong and supersensitive limbs allowing for superior athletic abilities and even new sports and games began to develop. In addition, lungs and other organs with increased capacity and abilities resulted; eye implants allowing for infrared vision, X-ray vision through solid objects and more. The crime world had changed forever, with empowered thugs, brawlers, and gangsters equipped with artificial skin, bone and limb replacements, allowing for extreme endurance and fighting capabilities. This chaos was balanced only by state-of-art police and military technologies supplied by governments and corporations.



## Genetics (see also Maulerian Eugenics chapter)

Compared to great leaps in cybernetics, genetics suffered deeply from sanctions and regulations by multiple governments. Only scientific, non-commercial research in the fields of DNA manipulation and modification was allowed, so no widespread effects on population and lifestyle resulted. Within the private sector, genetics was used only to scan embryos for potential defects and hereditary diseases. Of course the fields of virology, bacteriology and food production benefited from the advancements in genetics, but no human DNA modification was allowed, until the first half of the 21<sup>st</sup> century, when research was officially approved by the major factions. Secret military research was performed, but the results were never published, at least up to the revelation of G.F. Mauler and his Space Human Concept (also called Maulerian Eugenics). This research was funded by the Nazi power



circles and was performed in secret at Deimos laboratories. It represented a thorough and complex view on humans, evolution and society which influenced many thinkers and philosophers as well as politicians, military leaders and even mystics and occultists. The premise and facts supporting modification of human body and DNA was simply... astonishing; the possibilities during one's lifetime included enhancing the capabilities of the individual and extending the human life span to over one hundred years quite easily (at least this was presumed according to the research). However, further research soon surfaced that disclosed the alteration of personality and mutations of DNA, resulting in even more attention from scientific and military experts.

In 2063, Mauler and his team introduced a group of cybernetic mutations, "The Seven Reborn". The group was DNA altered, psychologically re-educated prisoners, formerly sentenced to death by EAC for severe crimes (murders, rapes). The Seven Reborn issue soon became highly controversial and all further DNA alteration research on humans was banned. Deimos Labs closed and Mauler was arrested for violating scientific doctrines. During a police SWAT team raid on Deimos Labs, hundreds of former death row prisoners were discovered - illegally held there. Mauler was subsequently quarantined and



sentenced to spend rest of his life at his summer residence in Quebec, Canada.

During the conclusion of the hearings after the judge announced the final verdict, Mauler prophesized:  
*“You may ban my research and lock me out from your world, but you will never stop what I have started! For the Space Human is the next natural step of mankind - a step of controlled evolution, giving the human spirit the perfect body it deserves. We are learning the basic secrets of the Universe, the keys to the Kingdom of God on Earth, the Paradise to live in within our own bodies of dust and flesh.”*

G.F. Mauler died in Quebec in 2070 during the Great Solar Event. He became known as the Father and the Prophet for the new Space Human movement among scientists, intellectuals and politicians. The research on human DNA alteration continued in secret, far from the attention of the public eye.

## Appendix I: Distances in the Solar System

The following table shows the distances within our Solar System and includes speed comparison between small ships (miners, fighters), inter-sector transporters and the speed of light.

Distance from the Sun to the Earth (in km)	<b>150,000,000</b>
Distance from the Sun to the Earth (in meters)	<b>150,000,000,000</b>
Sector length in meters	<b>200,000</b>
Number of sector between sun and earth	<b>750,000</b>
Distance from the Sun to Mars (in km)	<b>227,939,100</b>
Distance from the Sun to Jupiter (in km)	<b>800,000,000</b>
Distance from the Sun to Kuiper Belt (in km)	<b>4,487,936,100</b>
Speed of Light (km per hour)	<b>1,079,000,000</b>

	<b>Small Ship</b>	<b>Intersector Transportation</b>	<b>Speed of Light</b>
Ship - max speed (km per hour)	<b>2,412.0</b>	<b>10,000,000.0</b>	<b>1,079,000,000.0</b>
Ship - max speed (meters per sec)	<b>670.0</b>	<b>2,777,777.8</b>	<b>299,722,222.2</b>
Compared to speed of light	<b>0.0002%</b>	<b>0.9268%</b>	<b>100.0000%</b>
Travel time through whole sector (in seconds)	<b>298.5</b>	<b>0.1</b>	<b>0.0</b>
Travel time through whole sector (in minutes)	<b>5.0</b>	<b>0.0</b>	<b>0.0</b>
Travel time from sun to earth (in minutes)	<b>3,731,343.3</b>	<b>900.0</b>	<b>8.3</b>
Travel time from sun to earth (in hours)	<b>62,189.1</b>	<b>15.0</b>	<b>0.1</b>
Travel time from sun to earth (in days)	<b>2,591.2</b>	<b>0.6</b>	<b>0.0</b>
Travel time from sun to earth (in years)	<b>7.1</b>	<b>0.0</b>	<b>0.0</b>
Travel time from sun to mars (in hours)	<b>94,502.1</b>	<b>22.8</b>	<b>0.2</b>
Travel time from sun to Jupiter (in hours)	<b>331,675.0</b>	<b>80.0</b>	<b>0.7</b>
Travel time from sun to Kuiper Belt (in hours)	<b>1,860,670.0</b>	<b>448.8</b>	<b>4.2</b>

## Appendix II: Project Genesis and Science

Source: <http://www.newscientist.com/article/dn19327-lasers-could-make-virtual-particles-real.html>

### Principle description:

Next-generation lasers will have the power to create matter by capturing ghostly particles that, according to quantum mechanics, permeate seemingly empty space. The uncertainty principle of quantum mechanics implies that space can never be truly empty. Instead, random fluctuations give birth to a seething cauldron of particles, such as electrons, and their antimatter counterparts, called positrons. These so-called "virtual particles" normally annihilate one another too quickly for us to notice them. But physicists predicted in the 1930s that a very strong electric field would transform virtual particles into real ones that we can observe. The field pushes them in opposite directions because they have opposite electric charges, separating them so that they cannot destroy one another. Lasers are ideally suited for this task because their light boasts strong electric fields. In 1997, physicists at the Stanford Linear Accelerator Center (SLAC) in Menlo Park, California, used laser light to create a few electron-positron pairs. Now, new calculations suggest next-generation lasers will be able to create such pairs by the millions.

### Chain reaction

In the SLAC experiment, only one electron-positron pair was created at a time. But with more powerful lasers, a chain reaction becomes probable. The first pair is accelerated to high speed by the laser, causing them to emit light. This light, combined with that of the laser, spawns still more pairs, according to Alexander Fedotov of the National Research Nuclear University in Moscow and his colleagues in a study to appear in *Physical Review Letters*. "A large number of particles will spill out of the vacuum," says John Kirk of the Max Planck Institute for Nuclear Physics in Heidelberg, Germany - who was not involved in the study. In lasers that can concentrate about 1026 watts into a square centimeter, this runaway reaction should efficiently convert the laser's light into millions of electron-positron pairs, the team calculates.

### Antimatter factory

Such intensity could be reached with a laser to be built by the Extreme Light Infrastructure project in Europe. The first version of the laser could be built by 2015, but it could take a few years after that to complete upgrades necessary to reach 1026 per square centimeter, according to study co-author Georg Korn of the Max Planck Institute for Quantum Optics in Garching, Germany.

The ability to generate large numbers of positrons could be useful for particle colliders like the proposed International Linear Collider, which will smash electrons and positrons together, according to Kirk McDonald of Princeton University in New Jersey.

But Pisin Chen of National Taiwan University in Taipei theorizes the cost of the required very powerful laser might make this method unnecessarily expensive. The standard way to create large numbers of positrons today is to fire a beam of high-energy electrons at a piece of metal thus producing electron-positron pairs.

## Appendix III: Small craft

Small space craft are exclusively available and controlled by the player. They can be between 10 and 30 meters long. In the following text I focus only on their functionality, not their look.

Small crafts have to follow certain rules and restrictions. The player's view is centered, while the cockpit itself can be off center. Therefore, it's best if the cockpit is as close to ship's center as possible - same applies for weapons. Additionally, due to the types of enclosed environments common to mining, each ship requires one or more headlights. Finally, to allow for maneuvering in all directions, engine thrusters should be installed on each side - at least 6 on a ship, but additional ones are common especially on the rear and front.

### Player ship class parameters (depends on ship type):

- Max number and positions for weapons
- Max number of devices
- Supports drill?
- Supports harvesting tube?
- Cargo container capacity - number of cargo slots. From 1x1x to 8x8x8 (biggest ships). Dimension of any item is defined in slots – for simplicity.
- Armor type – in percents; if no armor, then value is 0%. Basically it says how much is decreased projectile/explosion power
- Fuel capacity in liters
  - xenon (for electrically powered)
  - helium (for chemical powered)
  - uranium (for nuclear powered)
- Electricity capacity – kWh – kilo watts per hour
- Oxygen capacity – in seconds – how long can player breathe?

### Player ship real-time parameters (change during the game play):

- **Weight**, depends on:
  - Ship type
  - Engine type
  - Armor type
  - Weight of weapons
  - Weight of unexpended ammo, fuel, oxygen
  - Items and ore in cargo container
  - Any other “things” stored in a ship
- **Speed** – depends on ship type, engine and weight
- **Player health**, from 0% to 100%
  - Default value is 100%
  - If below 50%, whole screen (including cockpit and HUD) gets dark red tint, gets blurry

- When player is damaged by projectile/explosion, screen is overplayed by red blood texture for 2-3 seconds
- Player health is negatively influenced by:
  - Bullets that gets into cockpit
  - Uranium / radioactivity proximity
  - Solar wind
  - Low oxygen
- Player health is positively influenced by:
  - Med kit / drugs
  - When inside mother ship hangar – automatic healing.
- **Armor damage** – how much is armor damaged and how effective it is right now. Default is 0% and increases after every projectile/explosion.
- **Damage**
  - Value from 0% to 100%
  - In future we will implement this through a 3D grid where we will be able to track how much of the ship is damaged in different parts. Also we will be able to detect where the armor is compromised.
- **Cargo container content** – the following objects can be stored here: ammo boxes, devices, ore, etc. Some items can use more slots.
  - Ammo boxes contain current unexpended number of projectiles.
- **Fuel** – consumed slightly when the engine is on), increasing proportionally to amount of movement, highest consumption when afterburner is engaged
  - Value is in liters and can be extended by “extra fuel container” in cargo container
  - Fuel has a second parameter – **Fuel Tank Damage** – from 0% to 100%. This indicates if and how much the fuel storage may be damaged. If compromised, fuel will likely leak. If heavily damaged, the ship will lose fuel rapidly.
    - Damage to fuel storage is random in this MW release as we won't be able to detect it.
    - If fuel damage is below 20%, any new “damage increase” can randomly lead to ship explosion (only for non-electricity engines)
  - When fuel is 0%, engines are turned off.
  - Moments before you run out of fuel, inertia cancellation should automatically engage so the ship stops before completely losing energy (This helps the player in survival and rescue).
- **Electricity** – consumed all the time, even when engines are off – because it powers computer, HUD, devices, weapons, etc. Also, electrically powered engines consume a lot of electricity;
  - When 0%, everything that requires electricity powers down.
  - Electricity / battery can be recharged by non-electric ship power plants.
  - Headlights consume electricity. Long-narrow lights should consume more energy than wide-short.
- **Oxygen** – capacity of remaining oxygen storage, in seconds

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- When zero for more than 30 seconds, player's health will start decreasing by 2% every second
- Oxygen storage decreases by 1 every second (player consumes the oxygen)
- Oxygen also has second parameter – **Oxygen Tank Damage** – from 0% to 100% and this indicates if the oxygen storage tanks have been damaged. As with fuel, it can leak.

To be added later...

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**Alien Artifacts and Gates**

**Wormhole System**

