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**Sierra On-Line, Inc.**

# **Outpost 2: Divided Destiny**

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Strategy Guide:  
Colony and Multiplayer Games

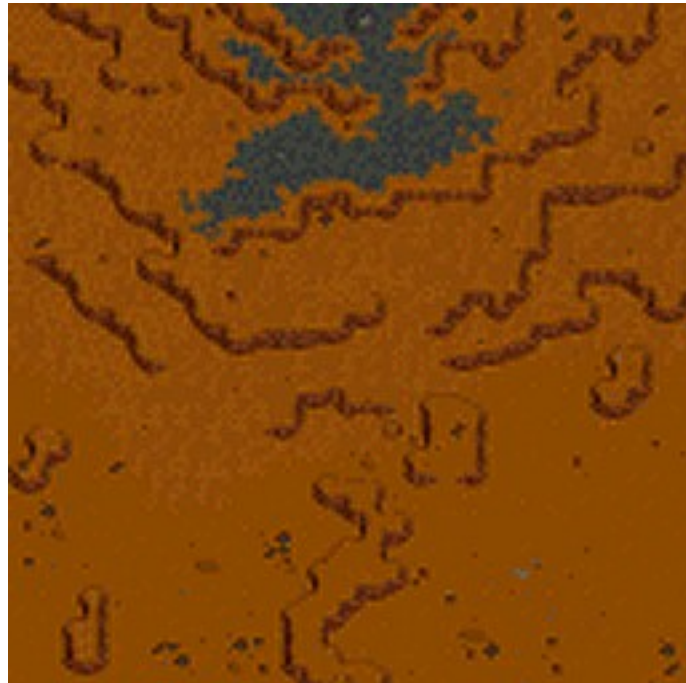
## Multiplayer Game Maps

### Two-Player Maps



**Map**  
"Ambush Alley"  
**Players**  
Two  
**Size**  
64 x 64  
**Scenarios**  
Last One Standing

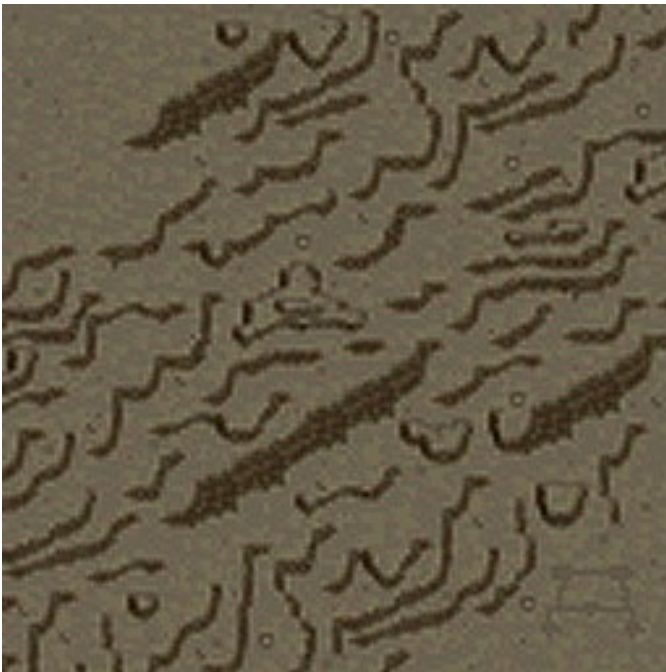
**Map**  
"Beach Party"  
**Players**  
Two  
**Size**  
128 x 128  
**Scenarios**  
Land Rush  
Last One Standing  
Resource Race





**Map**  
"Close Encounter"  
**Players**  
Two  
**Size**  
128 x 64  
**Scenarios**  
Land Rush  
Last One Standing  
Resource Race

**Map**  
"Great Divide"  
**Players**  
Two  
**Size**  
128 x 64  
**Scenarios**  
Land Rush  
Last One Standing

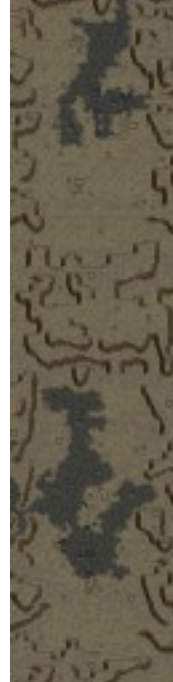


**Map**  
"Labyrinth"  
**Players**  
Two  
**Size**  
128 x 128  
**Scenarios**  
Last One Standing

**Map**  
"River of Fire"  
**Players**  
Two  
**Size**  
64 x 128  
**Scenarios**  
Last One Standing



**Map**  
"Twin Valleys"  
**Players**  
Two  
**Size**  
64 x 256  
**Scenarios**  
Midas



**Map**  
"Wishbone"  
**Players**  
Two  
**Size**  
128 x 64  
**Scenarios**  
Last One Standing



## Three-Player Maps

**Map**

"Biohazard"

**Players**

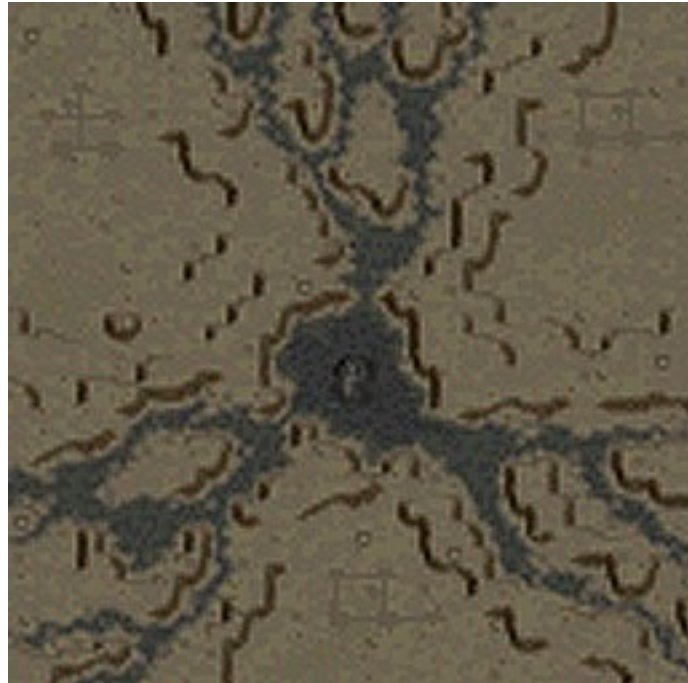
Three

**Size**

128 x 128

**Scenarios**

Space Race



**Map**

"Three's a Crowd"

**Players**

Three

**Size**

128 x 128

**Scenarios**

Land Rush

Last One Standing

Midas

Resource Race

Space Race

## Four-Player Maps



**Map**  
"Barren Land"  
**Players**  
Four  
**Size**  
256 x 256  
**Scenarios**  
Land Rush  
Midas

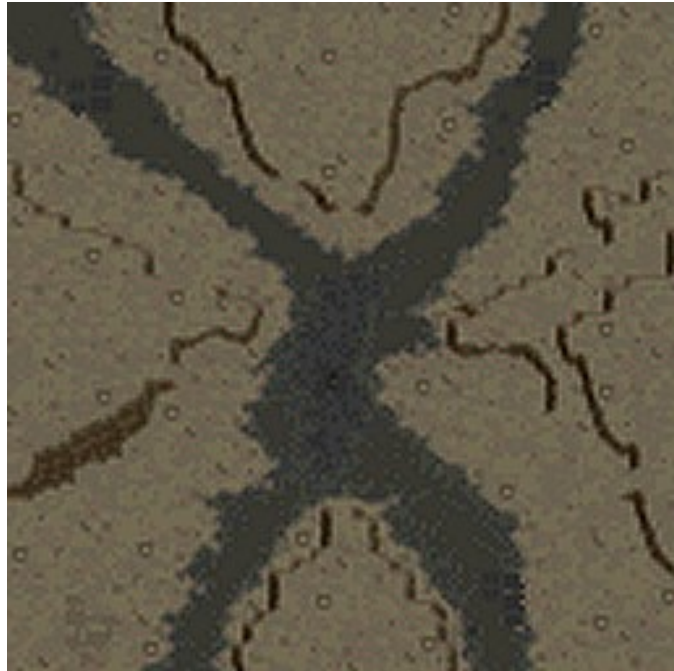
**Map**  
"Coliseum"  
**Players**  
Four  
**Size**  
128 x 128  
**Scenarios**  
Last One Standing  
Midas



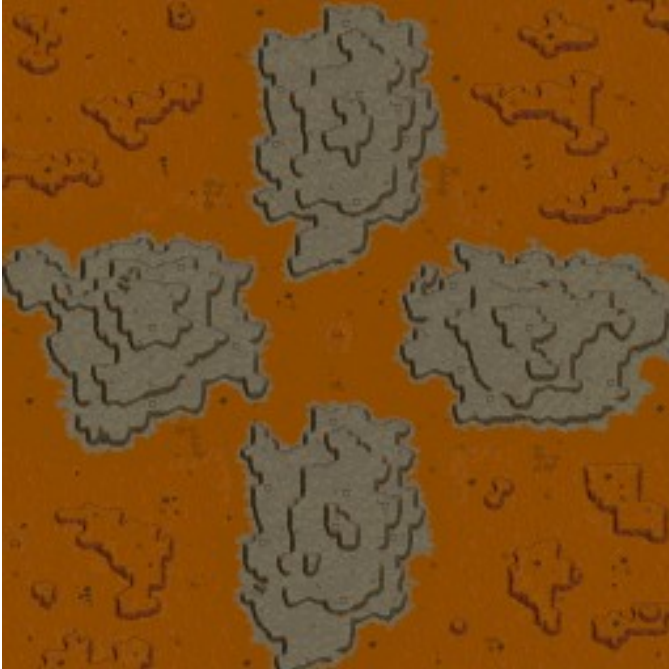


**Map**  
"Crash Zone"  
**Players**  
Four  
**Size**  
256 x 128  
**Scenarios**  
Last One Standing  
Resource Race  
Space Race

**Map**  
"Double Cross"  
**Players**  
Four  
**Size**  
128 x 128  
**Scenarios**  
Last One Standing  
Resource Race



**Map**  
"The Rift"  
**Players**  
Four  
**Size**  
256 x 128  
**Scenarios**  
Land Rush  
Last One Standing  
Midas  
Space Race



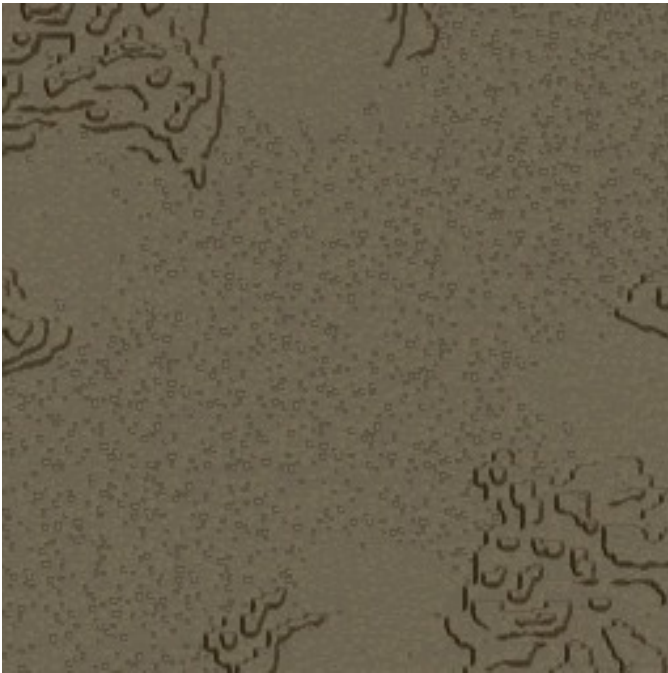
**Map**  
"Four Mesas"  
**Players**  
Four  
**Size**  
256 x 256  
**Scenarios**  
Land Rush  
Last One Standing

**Map**  
"Hidden Treasure"  
**Players**  
Four  
**Size**  
128 x 128  
**Scenarios**  
Midas





**Map**  
"Olympus Mons"  
**Players**  
Four  
**Size**  
256 x 256  
**Scenarios**  
Last One Standing  
Resource Race



**Map**  
"Rock Garden"  
**Players**  
Four  
**Size**  
256 x 256  
**Scenarios**  
Land Rush  
Resource Race  
Space Race

**Map**

"Unsettled Earth"

**Players**

Four

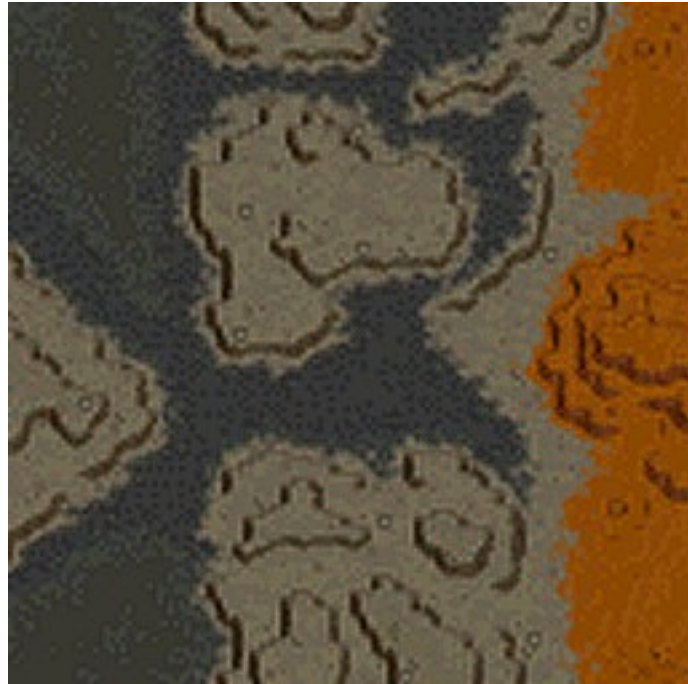
**Size**

128 x 128

**Scenarios**

Land Rush

Last One Standing



## Six-Player Maps



**Map (above)**  
"Around the World"

**Players**

Six

**Size**

512 x 256

**Scenarios**

Land Rush

Last One Standing

Space Race

These maps are a full-globe map, so driving off the right edge puts you on the left edge and vice versa.

**Map (below)**  
"Axen's World"

**Players**

Six

**Size**

512 x 256

**Scenarios**

Land Rush

Last One Standing

Resource Race



**Map**  
"Allied Siege"  
**Players**  
Six  
**Size**  
128 x 128  
**Scenarios**  
Last One Standing



**Map**  
"Root Canal"  
**Players**  
Six  
**Size**  
256 x 128  
**Scenarios**  
Land Rush  
Last One Standing  
Space Race

## Research

Most of the topics available in the two Campaign Games are also available in the Colony and Multiplayer Games, which share a research tree. However, because these games are not based on a series of missions, the predecessors of the various topics are somewhat different than in the Campaign Game. In some cases the research point costs and labs at which a topic may be studied are different. In this document, we have listed all of the research topics available in Colony and Multiplayer Games. These listings contain the following items:

- **Topic.** The topic name, as it is displayed in the Topic Selection display in the Command Pane.
- **Predecessor.** The names of any topics which must be completed before this one is available. Some topics have no predecessor; these are available for research at the beginning of the mission.
- **Cost.** The number of research points required to complete the topic. The rate at which points are accumulated depends on the number of Scientists assigned to the topic, the maximum number of Scientists which may be assigned, and the level of Morale. See **Research** in the *General Gameplay Strategy Guide*.
- **Sci.** The maximum number of Scientists which may be assigned to this topic.
- **Lab.** The type of lab, Basic, Standard, or Advanced, at which this topic may be researched.
- **Teaser.** The preliminary description of the goals and background of this project, shown in the Assign Scientists display in the Command Pane.
- **Description.** The post-completion description of the topic, shown in the Research Summary display (available as part of the Labs report) in the Command Pane.
- **Result.** The effect of completing this topic. In general, topics will either allow construction of a new structure, vehicle, or weapon, or will improve an existing structure, vehicle, or weapon.

## Eden Research

### Alphabetical Listing of Research Topics

Topic	Predecessor	Cost	Sci	Lab
<b>Acid Weaponry</b>	Advanced Combat Chassis Vulcanology	3500	16	Adv
Teaser	Our Common Ore Smelters produce a number of toxic byproducts during the processing of Common Ore into Common Metals. We believe we can use these wastes in a new weapons system.			
DESCRIPTION	Our Acid Cloud turrets fire a projectile which releases a cloud of corrosive acid that can eat through even the toughest armor. The cloud dissolves after a brief period, but any target caught within the cloud will take heavy damage.			
Result	Makes the Acid Cloud weapon available.			
<b>Advanced Armoring Systems</b>	Advanced Combat Chassis Enhanced Defensive Fortifications	3000	17	Adv
Teaser	The technologies developed by our space program have some spinoff applications on New Terra. One of these is an improvement to the armor systems we use on some of our vehicles.			
DESCRIPTION	Materials research done as part of our space program has resulted in an alloy well suited for use in combat vehicle armor.			
Result	Upgrades armor of Lynx (to Medium) and Panther (to Heavy).			
<b>Advanced Combat Chassis</b>	Advanced Vehicle Power Plant Mobile Weapons Platform Rare Ore Processing	2000	13	Adv
Teaser	While the Lynx has generally been a satisfactory design, it has proven to have a short life expectancy in combat. Our defenses require a heavier, more durable combat chassis.			
DESCRIPTION	The Panther medium combat chassis, based on the same vehicle body as the ConVec and Cargo Truck, is a heavier, better armored defender than its predecessor, the Lynx. Although slower than the Lynx, its greater durability in combat should improve our defenses.			
Result	Allows production of Panthers at the Vehicle Factory.			
<b>Advanced Robotic Manipulator Arm</b>	Robot-Assist Mechanic	2800	16	Std
Teaser	Certain units, such as the ConVec, use manipulator arms to accomplish complex tasks. Our cybernetic experts have a proposal for improving the flexibility and strength of these manipulator arms.			
DESCRIPTION	Several small refinements to the manipulator arms of these units, such as reconfigured joints, use of higher tensile strength metals in construction, and a software upgrade, add up to a substantial improvement in the production and repair rates of these units.			
Result	Improves the productivity of ConVecs, Earthworkers, Robo-Dozers, Repair Vehicles, and Garage by 25 percent. (Improves structure kit deployment, Tube and Wall construction, repair, and bulldozing times.)			
<b>Advanced Vehicle Power Plant</b>	High-Temperature Superconductivity	1400	11	Std
Teaser	Several of the vehicle models we use are powered by the R-2000 cool-fusion plant. Our work in High-Temperature Superconductivity may be applicable to an improvement of this power plant.			
DESCRIPTION	The new R-3000 series cool-fusion plant has been installed in all Cargo Trucks, Robo-Dozers, Earthworkers, replacing the earlier R-2000 model. This application of the High-Temperature Superconductivity technology has increased the speed of these vehicles.			
Result	Improves Cargo Truck, Robo-Dozer, and Earthworker speeds.			
<b>Artificial Lightning</b>	Increased Capacitance Circuitry	4000	18	Adv
Teaser	A new weapons system proposal has been submitted by our research staff. Using the dielectric insulator produced by our Increased Capacitance Circuitry project, a rapid discharge of a bank of capacitors could create an artificial lightning strike of massive power. The difficulty is in targeting the strike to strike enemy units, rather than a random discharge.			
DESCRIPTION	Our artificial lightning weapon, dubbed Thor's Hammer, is the most powerful weapon we have ever developed. This targeted lightning strike is capable of destroying small enemy units with a single shot!			
Result	Makes the Thor's Hammer weapon available.			
<b>Automated Diagnostic Examinations</b>	Health Maintenance	1500	8	Std
Teaser	The increase in our population is straining the capacity of our Medical Centers. We may be able to increase their capacity by automating some tasks.			
DESCRIPTION	A new type of robotic medical assistant has been developed which can perform many routine tasks at the Medical Center, allowing the staff to care for more patients.			
Result	Increases Medical Center capacity to 75 Colonists.			

<b>Command Module</b>	Skydock	3600	16	Adv
Teaser	Researchers combing through the partially-restored historical records in our databases have discovered a portion of the specifications for the bridge of the 'Conestoga.' This will speed our development of the command and control systems of the ship.			
DESCRIPTION	Several dozen Savant computer systems, working in parallel, make up the core of the Command Module. This is the most sophisticated computer system we have ever devised, capable of guidance control, power direction, and self-maintenance, without human intervention, for decades.			
Result	Allows production of the Command Module at the Spaceport.			
<b>Consumerism</b>	Environmental Psychology	1000	6	Std
Teaser	Though there are a number of goods and services they can purchase, our colonists are asking for something more: items that they can enjoy during their leisure hours. A few colonists have asked for time at our research facilities to respond to this need.			
DESCRIPTION	Our research into the psychological benefits of consumerism has led to the development of a production facility in which a variety of goods can be produced. These items can induce a short-term increase in Morale.			
Result	Allows production of Consumer Goods Factory structure kits at the Structure Factory.			
<b>Cybernetic Teleoperation</b>	none	800	10	Std
Teaser	Prior to the evacuation from our original colony site, Workers remotely operated our vehicles using a technology called Teleoperation. Since the catastrophe, we no longer have enough Workers to Teleoperate our vehicles. The Savant computers at the Command Center have taken on part of this burden, but the job is taxing their capacity. We need a specialized computer vehicle control system. This Cybernetic Teleoperation project should allow us to operate a much larger number of vehicles.			
DESCRIPTION	Our research has resulted in a specialized variant of the Command Center, with dedicated computers and communications capabilities. In addition, all vehicle designs now include the less expensive Noesis computer, utilizing elements of the Savant technology. This transfers much of the computing burden from the Robot Command Center to the vehicle itself.			
Result	Allows production of Robot Command Center and Vehicle Factory structure kits at the Structure Factory.			
<b>Directional Magnetic Fields</b>	Advanced Combat Chassis Independent Turret Power Systems	2000	14	Adv
Teaser	Some of our researchers, reviewing the military database brought from Earth, have found an abstract of a proposal for a weapon that uses a directional magnetic field to propel a projectile. Although plans for the weapon were lost, we believe we can recreate such a device.			
DESCRIPTION	The Rail Gun turret uses an electric current to accelerate a projectile to velocities of several hundred meters per second. The weapon consists of two copper rails and the R-10 cool-fusion power cell, which charges a capacitor. The capacitor is discharged into one rail and the current flows through the projectile into the second rail, producing a directional magnetic field that accelerates the projectile.			
Result	Makes the Rail Gun weapon available.			
<b>DIRT Procedural Review</b>	Emergency Response Systems	1800	10	Std
Teaser	As our colony grows, more and more resources must be invested in DIRTs to maintain adequate protection. DIRT members have made several suggestions that may reduce this burden. A review of methods and procedures is in order.			
DESCRIPTION	Using suggestions made by DIRT members, our emergency response procedures have been improved. Among the improvements are an additional team member, redesigned power-assist armor, and a new type of structural breach patch.			
Result	Increases DIRT protection capacity to 15 structures; increases DIRT Worker requirement to 3.			
<b>Dual-Turret Weapons Systems</b>	Advanced Combat Chassis Reinforced Vehicle Construction	4000	18	Adv
Teaser	One of our research Scientists has proposed doubling the rate of fire of our combat units by installing a dual weapons turret. This may be just the decisive advantage we need to end this destructive conflict.			
DESCRIPTION	The dual-turret weapons systems are capable of twice the effective rate-of-fire of their single-turret predecessors, but duplicate only 70% of the components, sharing certain support systems. Due to their size, they can only be mounted on the Tiger heavy combat chassis, a tracked vehicle based on the Earthworker and Robo-Dozer designs.			
Result	Allows production of Tigers at the Vehicle Factory.			

<b>Efficiency Engineering</b>	Consumerism Space Program	4000	16	Std
Teaser	All of our factories use a similar assembly-line method of production. Some of our factory workers, reading through the databases of industrial engineering techniques from Earth, have proposed a study of our factories, to look for possible increases in manufacturing efficiency.			
DESCRIPTION	Using time-and-motion analysis of the various production facilities, our researchers developed several new tools and techniques that reduced the production time of all products by 25%.			
Result	Reduces production time at the Consumer Goods Factory, Spaceport, Structure Factory, and Vehicle Factory by 25 percent.			
<b>Electromagnetic Pulsing</b>	Advanced Combat Chassis Independent Turret Power Systems	2400	11	Adv
Teaser	Since the early development of atomic weaponry, scientists have known about the disruptive effect of the electromagnetic pulse (EMP) on electronic circuitry. Our scientists believe they can use this knowledge to produce a defensive weapons system.			
DESCRIPTION	Electromagnetic pulse (EMP) grenades, fired from Guard Posts or combat chassis, produce a disruption in the power distribution circuitry of all vehicles or structures in range. This will briefly render the target inoperable.			
Result	Makes the EMP weapon available.			
<b>Emergency Response Systems</b>	none	1000	10	Std
Teaser	Given the new dangers confronting our colony, we need more protection against disaster than our emergency shelters are able to provide. This project will develop new methods, tools, and techniques to respond to structural damage.			
DESCRIPTION	Disaster Instant Response Teams (DIRTs) can reduce damage to structures. Once the DIRT structure has been deployed, DIRT members trained in emergency medical care and structural reinforcement will be on the scene in a matter of seconds.			
Result	Allows production of DIRT structure kits at the Structure Factory.			
<b>Enhanced Defensive Fortifications</b>	Large-Scale Optical Resonators Rare Ore Processing	1600	12	Std
Teaser	With tensions increasing between the colonies, we must make our defenses as strong as possible.			
DESCRIPTION	The armor applied to our Guard Posts is now equal to that protecting our most vital structures.			
Result	Upgrades Guard Post armor to Heavy.			
<b>Environmental Psychology</b>	none	1500	12	Std
Teaser	Environmental Psychology studies the relationships between human behaviors and the environments in which they occur. The forced evacuation of our old colony site has increased the stress on our Colonists; additional research in this field may help us to create a more supportive environment and improve Morale.			
DESCRIPTION	Our expanded knowledge of the causes and effects of crowding and environmental and situational stressors has enabled us to redesign our Residences. We can now house more people in the same space, while improving Morale.			
Result	Increases Residence capacity to 35 Colonists.			
<b>Expanded Housing</b>	Environmental Psychology	1600	10	Std
Teaser	As our population has grown, so has the number of Residence structures we need to house our people, making the colony more difficult to manage. A larger Residence facility, serving more colonists, would reduce some of our administrative problems.			
DESCRIPTION	The new Advanced Residence structure provides our colonists with larger, more spacious quarters, yet reduces administrative and maintenance difficulties and has only a slightly higher cost.			
Result	Allows production of Advanced Residence structure kits at the Structure Factory.			
<b>Explosive Charges</b>	Mobile Weapons Platform	900	11	Std
Teaser	A simple and inexpensive weapons system could be developed by placing high explosive charges into a weapons turret. Although the vehicle would be destroyed by the detonation, the size of the charge could quickly incapacitate several enemy units at once.			
DESCRIPTION	The Starflare turret is a large trinitrotoluene (TNT) bomb, which may be placed on the Lynx or Panther combat chassis, or installed into a Guard Post. This high-explosive will damage all units within range.			
Result	Makes the Starflare weapon available.			
<b>Extended-Range Projectile Launcher</b>	Acid Weaponry Electromagnetic Pulsing	4000	18	Adv
Teaser	Our after-action equipment performance reports show a weakness in the launch mechanism used in our EMP and Acid Cloud weapons turrets. Though this weakness does not cause an equipment failure, our engineers would like to revisit the design of this launcher.			
DESCRIPTION	The redesigned launch mechanism used in both of these weapons has lengthened the maximum range of these weapons.			
Result	Increases range of EMP and Acid Cloud to 7.			



<b>Fueling Systems</b>	Ion Drive Module	3600	16	Adv
Teaser	Because our starship will have a dual-propulsion system, it needs a dual fueling system. The Ion Drive will be fueled by liquid mercury, which must be gathered on New Terra. The Fusion Drive uses hydrogen as fuel. This may be gathered here, but our engineers suggest developing a fuel-gathering craft which can collect hydrogen from a planet's atmosphere.			
DESCRIPTION	The Fueling Systems consist of storage tanks for liquid mercury, used to fuel the Ion Drive, and the Fuel Shark, an autonomous ramscoop vehicle that dives into the outer layers of the planet's atmosphere to gather hydrogen fuel for the Fusion Propulsion system. The Fuel Shark will substantially reduce the number of launches necessary to prepare the starship for flight.			
Result	Allows production of the Fueling Systems at the Spaceport.			
<b>Fusion Drive Module</b>	Ion Drive Module	3600	16	Adv
Teaser	The Ion Drive we have developed is well-suited for use in interstellar space, but for travel within a solar system, a fusion motor will greatly reduce travel time.			
DESCRIPTION	Our fusion propulsion system plans are complete. The Fusion Drive Module contains both the fusion motor, used for high-acceleration in-system maneuvering, and the tanks which store the hydrogen fuel used in this motor. Once we have reached interstellar space, this fusion motor will provide power to the Ion Drive.			
Result	Allows production of the Fusion Drive Module at the Spaceport.			
<b>Geothermal Power</b>	Rare Ore Processing	2200	14	Std
Teaser	On Earth, a significant percentage of electric power was generated by geothermal power plants. Although New Terra does not have ground water like Earth, and therefore cannot have the same kind of steam generation that Earth's geothermal plants had, recent volcanic activity indicates a great deal of underground heat that we may be able to tap into to produce power.			
DESCRIPTION	Although New Terra does not have ground water, and therefore does not generate underground steam and hot water that produced power on Earth, the fumaroles in this area do contain molten salts and gasses that can be used similarly. The Geothermal Plant is a less expensive and more stable power generation facility than our current Tokamak plant.			
Result	Allows production of Geothermal Constructors (GeoCons) at the Vehicle Factory.			
<b>Grenade Loading Mechanism</b>	Extended-Range Projectile Launcher	3600	18	Adv
Teaser	Tests of the reloading mechanism in our grenade launching weapons, the EMP and Corrosive Acid have revealed some potential areas of improvement.			
DESCRIPTION	The hydraulic grenade loading mechanism used in some of our weapons turrets had been designed to handle ammunition that was much less shock-resistant than those we currently have in use. Increasing the 'rattle' tolerances of the system allows for a faster loading system.			
Result	Improves EMP and Acid Cloud rate of fire.			
<b>Habitat Ring</b>	Skydock	3600	16	Adv
Teaser	One of the greatest dangers of our interstellar voyage will be the bombardment of the starship with radiation and dust particles. We must develop some kind of protection against damage to the ship.			
DESCRIPTION	Before and after our interstellar flight, our colonists will live in the Habitat Ring. These temporary quarters are shielded from radiation and small particle collisions by a magnetic field generated by superconductive coils built into the hull.			
Result	Allows production of the Habitat Ring at the Spaceport.			
<b>Health Maintenance</b>	none	700	7	Std
Teaser	Although our emergency medical systems are adequate to deal with accidents and disasters, our people are suffering from a lack of regular medical care. We could exploit the vast medical knowledge in our databases to develop a regimen of health maintenance practices.			
DESCRIPTION	Medical Center personnel are trained in a variety of techniques of preventive medicine as well as the treatment of illness and injury. Each Medical Center can support the health needs of up to 40 colonists, improving the health and morale of the colony.			
Result	Allows production of Medical Center structure kits at the Structure Factory.			
<b>Heat Dissipation Systems</b>	Artificial Lightning	3600	18	Adv
Teaser	Some of our weapons systems generate high levels of heat when repeatedly fired in combat. These weapons require a cooling-off period before they can be fired again. This delay could be shortened by adding a heat dissipation system.			
DESCRIPTION	Our new weapons turret heat sinks allow these weapons to be fired more quickly. The heat sinks use dichlorodifluoromethane gas as a coolant to prevent weapon overheating.			
Result	Increases Laser, Rail Gun, and Thor's Hammer rate of fire.			

<b>Heat Mining</b>	Geothermal Power	1600	10	Std
Teaser	Our Geothermal Plants rely on the molten salts and gasses found in fumaroles to generate power. Heat Mining, or Hot Dry Rock geothermal power generation, may allow us to place Geothermal Plants in places without fumaroles by injecting cold water into deep bore wells, then capturing the steam produced when the water reaches the hot rocks in the New Terran surface.			
DESCRIPTION	Our Heat Mining project has met with limited success. We have not been able to develop a viable geothermal plant that can be deployed away from fumaroles, but by injecting cold water into the fumarole, we have been able to increase the output of our Geothermal plants.			
Result	Increases Geothermal Plant Power production to 650.			
<b>High-Energy Ray-Composite Projector</b>	Meteor-Watch Observatory	4000	18	Std
Teaser	Some very ambitious high-energy physicists have submitted a proposal for an energy weapon. Their theory combines both microwave and laser projection with a particle beam projector.			
DESCRIPTION	The High-Energy Ray-Composite (HERC) Projector is now functional. Although the equipment needed to produce this energy/particle beam is far too massive for use in a weapons turret, it is ideal for use as a meteor defense. Using the tracking capabilities of the Observatory, the HERC beam can destroy even the largest meteors with a single shot — if it hits its target.			
Result	Allows production of Meteor Defense structure kits at the Structure Factory.			
<b>High-Temperature Superconductivity</b>	Research Training Programs	1100	11	Adv
Teaser	Superconductivity is the ability of certain materials to conduct electric current with no resistance and extremely low losses. The best superconductive materials we have require an operating temperature of 152 degrees Kelvin (-121 degrees Celsius). Many new applications could be developed with a significant increase in the temperature of superconduction.			
DESCRIPTION	Our research into High-Temperature Superconductivity has resulted in the discovery of an alloy that is superconductive at 236 degrees Kelvin (-37 degrees Celsius), over 80 degrees higher than our previous superconductors, improving power generation at our Tokamaks.			
Result	Increases Tokamak Power output to 300.			
<b>Hot-Cracking Column Efficiency</b>	Metals Reclamation Rare Ore Processing	1400	14	Std
Teaser	Smelters and GORFs are dependent on hot cracking columns to separate the Metal content of Ores or rubble. This equipment has a very high Power demand. We believe that we may be able to apply our high-temperature superconductive material to some elements of this system and reduce the Power demand.			
DESCRIPTION	Common Ore Smelter, Rare Ore Smelter, and GORF Power requirements reduced.			
Result	Reduces Common Ore Smelter, Rare Ore Smelter, and GORF Power requirements to 40 units each.			
<b>Hydroponic Growing Media</b>	none	1600	11	Std
Teaser	Our Agridomes use a variety of methods, including Hydroponics (soilless farming) to fill our Food requirements. Some of our Agricultural Workers have ideas on ways to improve the growing medium in which our Hydroponic crops are grown.			
DESCRIPTION	By adjusting the nutrients in the liquid in which our hydroponic crops are grown, we have been able to increase production at our Agridomes by 25%.			
Result	Increases Food production to 50 units.			
<b>Hypnopaedia</b>	Research Training Programs	800	10	Std
Teaser	As our research projects become more complex, we need to improve our methods of training scientists. Hypnopaedia, or sleep-learning, is a method we plan to investigate.			
DESCRIPTION	Our hypnopaedia project has borne limited fruits. Sleep-learning is useful only in reducing the time required for memorization. This is helpful in that a large part of our research training requires knowledge of what types of research are described in our scientific databases.			
Result	Reduces points required to train Scientists to 3750 (1875 in multiplayer).			
<b>Improved Launch Vehicle</b>	Space Program	6000	18	Adv
Teaser	Our SULVs lack cargo sufficient capacity for some of the resource cargo modules we will need to launch in the final stage of the evacuation of New Terra. In addition, they are proving quite expensive on a per launch basis. Our aeronautical experts have proposed a new launch vehicle to address both of these issues.			
DESCRIPTION	The RLV program solves both of the design issues caused by our original SULV. The cargo capacity of the RLV is 40% larger than that of the SULV, allowing it to carry the largest starship modules we develop. And, though a single RLV is much more costly than a single SULV, on a per-launch basis, the RLV is significantly less expensive.			
Result	Allows production of the Reusable Launch Vehicle (RLV) at the Spaceport.			

<b>Increased Capacitance Circuitry</b>	Directional Magnetic Fields	1800	10	Adv
Teaser	As our experience in using Rare Metals grows, we find new applications for these materials. Our boptronics engineers believe they can refine the design of the dielectric insulators used in some of our high-voltage capacitors to improve their efficiency.			
DESCRIPTION	The new design of the dielectric insulator has increased the capacitance of the capacitors used in the Rail Gun weapon systems. The higher discharge increases the acceleration of the projectile by 20%. In addition, our researchers are brainstorming another possible use for this technology, and will soon submit a new project proposal.			
Result	Increases Rail Gun concussion damage to 100, penetration damage to 50.			
<b>Independent Turret Power Systems</b>	High-Temperature Superconductivity Mobile Weapons Platform	1600	12	Adv
Teaser	Our weapons turrets currently feed off the Lynx cool-fusion power plant. Because of the other demands on this power system, the amount of power that is available to the weapon is limited. Our research project will develop an independent power source for weapons turrets.			
DESCRIPTION	The R-10 cool-fusion power cell, just developed, is a small but powerful generator designed to fit into the weapons turret on our Lynx combat vehicles. This replaces the power feeds from the Lynx' own cool-fusion plant, and makes possible other, more powerful weapons systems.			
Result	Increases Laser penetration damage to 45.			
<b>Ion Drive Module</b>	Skydock	3600	16	Adv
Teaser	While the main drive of the 'Conestoga' was a less capable fusion drive, it appears that an improved ion propulsion system was developed shortly before launch and used in some thruster systems. Development of an Ion Propulsion interstellar drive will be a substantial step in our starship program.			
DESCRIPTION	The ion motor is a low-thrust/long-duration system which will be activated once the ship reaches interstellar space. The Ion Drive Module contains this interstellar drive as well as supplemental ion and chemical guidance thrusters to be attached to the starship.			
Result	Allows production of the Ion Drive Module at the Spaceport.			
<b>Large-Scale Optical Resonators</b>	none	1200	12	Std
Teaser	Inter-colonial relations remain poor, making it prudent to develop some kind of defensive capability. Our most promising research proposal derives from the welding and cutting lasers used at the Structure Factory. The key development will be the design of an optical resonator large enough to produce a weapons-strength beam.			
DESCRIPTION	Industrial laser torches provided the model for the Laser turret, whose large-scale optical resonators are capable of generating a beam that can slice through enemy targets quite easily.			
Result	Makes the Laser weapon available. Allows production of Guard Post structure kits at the Structure Factory.			
<b>Lava Defenses</b>	Rare Ore Processing Vulcanology	1200	12	Adv
Teaser	Volcanic eruptions continue to pose a substantial danger. We must find some way of routing these lava flows away from the colony.			
DESCRIPTION	In our search for a way to reduce the threat of volcanic eruptions, we have found a material that can, at least temporarily, resist the intense heat of a lava flow. This material, sprayed on a wall built of heavily-compressed regolith, can delay the approach of lava to our structures, giving us more time to evacuate.			
Result	Allows Earthworkers to deploy Lava Walls.			
<b>Leisure Studies</b>	Environmental Psychology	1400	7	Std
Teaser	Our colonists are asking for additional entertainment options for their off-duty hours. This project proposes to tap the humanities database for possible leisure-time activities.			
DESCRIPTION	Our leisure studies project has produced a number of activities, for both individuals and groups, that will amuse, entertain, and stimulate our colonists. Recreation facility personnel are trained to organize physical exercise classes, games, and tournaments, and to teach various handicrafts.			
Result	Allows production of Recreation Facility structure kits at the Structure Factory.			
<b>Magma Purity Control</b>	Magma Refining	4500	18	Adv
Teaser	Although magma contains all of the elements we classify as Rare Metals, it also contains several other elements which are essentially waste materials. We may be able filter out some of these additional materials in our molten magma flow.			
DESCRIPTION	Our Magma Purity Control technique removes several waste materials from the magma before cooling it for transport to the Rare Ore Smelter.			
Result	Increases Rare Ore yield at Magma Well to 150.			

<b>Magma Refining</b>	Geothermal Power Vulcanology	3200	16	Adv
Teaser	Initial observations of the magma vents that have begun to appear on the New Terran surface indicate that the magma is rich in Rare Metals. If we could develop a method of safely using this magma, it would greatly increase our supply of this resource.			
DESCRIPTION	Using the same basic configuration as our Mines, we have created a process of extracting and cooling magma from magma vents. The product of this process is a steady supply of Rare Ores, with a constant yield of 100 units of Rare Metals.			
Result	Allows Robo-Miners to deploy as Magma Wells. Robo-Miner production cost increases to 800 Common Metals.			
<b>Metallogeny</b>	none	1100	11	Std
Teaser	Metallogeny is the branch of geology that seeks to define the relationship between the geological history of an area and its mineral deposits. Metallogenic research is aimed at achieving a better understanding of the nature and geological settings of base and precious metal deposits, and to use this understanding to help develop areas of high mineral potential.			
DESCRIPTION	Our Metallogenic research has developed a new technique of locating and exploiting veins of Ore. This new method has increased Common Ore production.			
Result	Increases Common Ore Mine yield by 20 percent.			
<b>Metals Reclamation</b>	none	700	7	Std
Teaser	With our growing needs, we can no longer afford to overlook any possible sources of Metals. A few adaptations to our current Smelter technology may enable us to reclaim some of the materials in structures we no longer need.			
DESCRIPTION	The Garbage and Ore Recycling Facility (GORF) uses a variant of the hot-cracking technology used at the Common Ore Smelter to extract usable Metals from deconstructed structures, unneeded structure kits, and rubble.			
Result	Allows production of GORF structure kits at the Structure Factory.			
<b>Meteorology</b>	Vulcanology	1800	11	Std
Teaser	Although there have always been electrical discharges in the New Terran atmosphere, the atmosphere's low pressure caused these discharges to be manifested as sudden glows, rather than lightning strikes as on Earth. Now, with the thickening of the atmosphere, dangerous lightning is becoming more of a danger. We need to study these strikes so that we can predict their occurrence and take precautions.			
DESCRIPTION	We now understand the atmospheric conditions that lead to filamentous, or arc, lightning discharges in the New Terran atmosphere, and can predict their occurrence. On Earth, collisions between water particles of varying sizes caused the build-up of an electrical charge in the atmosphere. Negatively-charged particles in storm clouds were attracted to the positively-charged ground. The process is similar on New Terra, except that instead of water particles colliding, we have dust particles colliding.			
Result	Gives early warning of electrical storms.			
<b>Meteor-Watch Observatory</b>	Space Program	1800	12	Std
Teaser	After the recent meteorite impacts, our observations have found that more are to come. New Terra is entering a field of debris, probably caused by the collision of two asteroids. We need a way to track this debris so we can have some advance warning of meteorite impacts.			
DESCRIPTION	Deployment of the Observatory structure will allow us at least a minimal amount of warning of meteorite impacts in the area of our colony. The Observatory incorporates a wide-field optical telescope with a sophisticated tracking system to allow us to project the path of incoming meteors.			
Result	Allows production of Observatory structure kits at the Structure Factory.			
<b>Mobile Weapons Platform</b>	Cybernetic Teleoperation Large-Scale Optical Resonators	1400	12	Adv
Teaser	While our Command Center staff is quite pleased with the new Guard Post structures, they point out that our defenses are rather inflexible, due to their lack of mobility. At their suggestion, our Scientists have outlined a project for developing a mobile weapons platform.			
DESCRIPTION	The 'Lynx' light combat chassis is a design adapted from existing vehicles. The Lynx includes light armor-plating and a weapons hard point, to which any kind of turret may be attached.			
Result	Allows production of Lynx at the Vehicle Factory.			
<b>Multitainment Console Upgrade</b>	Leisure Studies	1300	9	Std
Teaser	The demands on our Recreation Facilities have grown even as our colony has grown. This project hopes to ease the situation by improving the multitainment consoles so many of our colonists use during their off-duty hours.			
DESCRIPTION	Our improved Multitainment Consoles are smaller and less expensive, while maintaining their high performance level. The number of units included in the Recreation Facility design has been increased, allowing the facility to serve more colonists.			
Result	Increases Recreation Facility capacity to 60 Colonists.			

<b>Offspring Enhancement</b>	none	600	6	Std
Teaser	With our population dwindling, we must find ways of increasing our numbers. This project is designed to find ways of increasing the birth rate as well as improving the health of our children.			
DESCRIPTION	Based on the data developed in the Human Genome Project, completed a few years before the destruction of Earth, our Offspring Enhancement program includes selection of genetically superior children from our gene banks, in vitro gestation, and fertility enhancement.			
Result	Allows production of Nursery structure kits at the Structure Factory.			
<b>Orbital Package</b>	Skydock	3600	16	Adv
Teaser	Upon arrival at our new home, we want to deploy a series of satellites and probes that will provide data about the planet and support colony operations.			
DESCRIPTION	This group of satellites and probes, to be deployed upon reaching our destination planet, includes EDWARD, a communications satellite, a solar power satellite, orbital observers, and several types of atmospheric and geologic probes.			
Result	Allows production of the Orbital Package at the Spaceport.			
<b>Phoenix Module</b>	All other Starship Components <sup>1</sup>	3600	16	Adv
Teaser	Before we land our colonists on the new planet, we must send a lander to prepare the early stages of a colony. We have in our databases portions of the plans for the Seed Factory used on our arrival on New Terra, but they are incomplete and obsolescent.			
DESCRIPTION	When deployed, this self-contained lander transforms into several of the initial structures and vehicles needed to start a colony. These structures are all capable of operation without human presence, and will give our new home a head start.			
Result	Allows production of the Phoenix Module at the Spaceport.			
<b>Precision Trajectory Projection Software</b>	High-Energy Ray Composite Projector	2400	14	Std
Teaser	Our Meteor Defense is effective... when it can find the target. Field tests of the system show a significant possibility of inaccurate targeting coordinates generated by the Observatory tracking software.			
DESCRIPTION	Revision of the meteor tracking software, using algorithms developed as part of the space program, has improved the trajectory projection software used at the Observatory. This will increase the probability of destroying incoming meteors before they reach our colony.			
Result	Improves Observatory's meteor targeting system.			
<b>Rare Ore Extraction</b>	Rare Ore Processing	3400	17	Adv
Teaser	Our Rare Ore mining facilities have had only moderate success at finding the best methods of extracting higher grades of Rare Ore. Several proposals have been put forward to improve our efficiency.			
DESCRIPTION	Our project has met with limited success. We have developed two new processes that determine the Rare Metal content of certain gangue materials, such as quartz, and eliminate specimens containing only trace amounts of Rare Metal.			
Result	Increases Rare Ore Mine yield by 20 percent.			
<b>Rare Ore Processing</b>	Cybernetic Teleoperation High-Temperature Superconductivity Metallogeny	2800	16	Adv
Teaser	Since our arrival on New Terra, we have encountered a number of sites that are rich in rare mineral deposits, but we have had neither applications which called for Rare Metals nor methods of processing these Rare Ores. Now, our scientists have a number of projects they wish to undertake which would require Rare Metals.			
DESCRIPTION	Rare Metals will be a great asset to us. These metals can be used in several new research projects.			
Result	Allows production of Rare Ore Smelter and Rare Metals Storage Tanks structure kits at the Structure Factory, and allows Robo-Miners to deploy as Rare Ore Mines. Increases Robo-Miner production costs to 700 Common Metals			
<b>Recycler Postprocessing</b>	Metals Reclamation	1500	10	Std
Teaser	The hot-cracking column used in our GORFs successfully reclaims approximately 50% of the Metals content of materials. We have some theories about a secondary process that can recover additional metals from the remaining slag.			
DESCRIPTION	Metals recovered through recycling increased.			
Result	Increases Metals recovered through recycling.			

<sup>1</sup> These include: Command Module, Fueling Systems, Fusion Drive Module, Habitat Ring, Ion Drive Module, Orbital Package, Sensor Package, Skydock, and Stasis Systems.

<b>Reinforced Vehicle Construction</b>	Rare Ore Processing	1200	12	Std
Teaser	The Cargo Truck, and some similar vehicles, have shown themselves to be all too vulnerable to damage from disasters, explosions, and attacks. Through the use of new composite alloys incorporating Rare Metals, we can increase their durability.			
Description	The durability of these vehicles has been improved through a combination of revised construction and the use of a composite alloy incorporating Rare Metals.			
Result	Increases Hit Points and changes production costs of ConVecs, Cargo Trucks, and Evacuation Transports.			
	<b>Hit Points</b>	<b>Cargo Truck</b>	<b>ConVec</b>	<b>Evacuation Transport</b>
		750	375	280
	<b>Common Metals cost</b>	500	1000	650
	<b>Rare Metals cost</b>	100	150	100
<b>Reinforced Panther Construction</b>	Advanced Combat Chassis Reinforced Vehicle Construction	1500	11	Adv
Teaser	The composite alloy developed in our Reinforced Vehicle Construction project may be beneficial for our Panther combat chassis as well.			
DESCRIPTION	A redesign of the Panther using a new composite alloy has increased the durability of this combat chassis.			
Result	Increases Panther Hit Points to 700; changes production costs to 300 Common Metals and 150 Rare Metals.			
<b>Research Training Programs</b>	none	300	5	Std
Teaser	A lack of trained workers and scientists is hampering our colony's efforts. We need to develop a curricula that will educate our workforce and expand our research staff.			
DESCRIPTION	Our new educational curriculum for training scientists includes intensive class work, independent study with Savant computers, VR simulations, and internships at the research labs.			
Result	Allows production of University and Advanced Lab structure kits at the Structure Factory.			
<b>Robot-Assist Mechanic</b>	Cybernetic Teleoperation	800	8	Std
Teaser	Our cybernetics experts have proposed a new robot that can be used in repairing vehicles.			
DESCRIPTION	Robot-Assist Mechanics, installed at the Garage, are capable of doing most vehicle repairs. A special version has been mounted on a vehicle for field repairs.			
Result	Allows production of Garage structure kits at the Structure Factory and of Repair Vehicles at the Vehicle Factory.			
<b>Robotic Image Processing</b>	Cybernetic Teleoperation	1400	12	Std
Teaser	The visual recognition systems of our robotic vehicles have a limited useful range, partially due to the limitations of the image processing software. Some of our programmers have a possible solution.			
DESCRIPTION	Through a combination of improved image processing software and increased zoom telescoping vision systems, the visual recognition range of certain units has been improved.			
Result	Improves sight ranges of Light Tower (to 9), Guard Post (to 9), and Scout (to 8).			
<b>Scout-class Drive Train Refit</b>	Mobile Weapons Platform	1500	12	Std
Teaser	The Scout, and some similar vehicles, use the G-75 drive train. We have discovered a design flaw in the G-75 that impairs its efficiency. This project would redesign the G-75 to make it more effective.			
DESCRIPTION	The G-75 drive train used in these three vehicles has been replaced by the G-80 model, which improved vehicle speed through a more efficient transfer of energy from the power plant to the wheels.			
Result	Increases Scout, Robo-Surveyor, and Lynx speeds.			
<b>Seismology</b>	none	1800	11	Std
Teaser	Our previous research on the geology of New Terra indicated that the planet was not subject to seismic activity; recent events, however, have changed the situation. Our planetary sciences database shows that seismologists had developed methods of seismic event prediction on Earth; some of these techniques may be adaptable to New Terra.			
DESCRIPTION	We have developed equipment to detect certain hydrogeochemical early warning signals of seismic events. Among the most reliable indicators are variations in the concentration of radon and carbon dioxide in the molten salts found in deep bore wells or in fumaroles. These warnings should give us some time to idle structures in the vicinity of the epicenter, reducing damage to them.			
Result	Gives early warning of seismic events.			
<b>Sensor Package</b>	Skydock	3600	16	Adv
Teaser	Our starship must have a remote sensing system, which will serve two purposes. First, it must help us avoid collision with asteroids and other large objects. Second, it will receive data from interstellar probes we send out to find our new home.			
DESCRIPTION	Before we can depart the New Terra system, we must have a destination. Our Sensor Package includes a Nanoprobe launcher, capable of sending thousands of microbe-sized probes toward potentially habitable planets, and a sensor/telemetry system which will evaluate the reports sent back by the Nanoprobes.			
Result	Allows production of the Sensor Package at the Spaceport.			

<b>Severe Atmospheric Disturbances</b>	Meteorology	1800	12	Std
Teaser	The vortexes we have been experiencing are a new phenomenon on New Terra; we must study these severe storms to determine how they are caused and how to predict them.			
DESCRIPTION	The vortexes start in a manner similar to the 'dust-devils' common on Earth and Mars. Ground-level air, heated by sunlight, rises. Cooler air rushes into the area that the warmer air has left, but from there, the spinning column of air is enhanced and focused by a yet-unknown process which may be electromagnetic in nature. While our understanding is limited, we can now forecast conditions that will lead to their formation, and have developed technologies for early detection.			
Result	Gives early warning of vortexes.			
<b>Skydock</b>	Space Program	3600	16	Adv
Teaser	Our Skydock will function as an orbital command post. In addition to docking facilities for our launch vehicles ferrying components and technicians, it serves as a command and control facility for construction of our starship.			
DESCRIPTION	Now that we have regained space launch capabilities, we can begin construction of a new starship. The first step is an orbital station from which we can start deploying components of the ship.			
Result	Allows production of the Skydock at the Spaceport.			
<b>Smelter Postprocessing</b>	Rare Ore Processing Recycler Postprocessing	3800	17	Adv
Teaser	The chemical postprocessing technique we developed for improving metals reclamation at the GORF may be adaptable for use at our Common Ore and Rare Ore Smelters.			
DESCRIPTION	We have successfully adapted the chemical postprocessing treatment used at the GORF to improve the yield of our Smelters.			
Result	Increases Common Ore Smelter and Rare Ore Smelter production.			
<b>Solar Power</b>	Space Program	2800	16	Adv
Teaser	The technology behind solar power has been available for quite some time, the size of the solar collector panels needed to generate a significant amount of power has always been judged prohibitive, especially since our periodic evacuations began. However, with the redevelopment of a space program, it is possible to build a solar collector satellite which beams the energy it collects to a ground-based receiver.			
DESCRIPTION	The solar power system, comprised of a collector satellite and ground-based receiver, is an inexpensive alternative energy source. The satellite, once in orbit, can be retargeted at a new ground location after an evacuation, and the receivers are much less volatile than our Tokamak fusion reactors.			
Result	Allows production of the Solar Power Array at the Structure Factory and the Solar Power Satellite at the Spaceport.			
<b>Space Program</b>	Rare Ore Processing	3600	16	Adv
Teaser	Many of our colonists feel, now that our colony is beginning to grow, that it would be wise to start another starship project. Having colonies on separate planets would help to ensure the survival of humanity.			
DESCRIPTION	Our space program is underway. As an initial cargo, we have developed the Early Disaster Warning and Resource Detection (EDWARD) satellite.			
Result	Allows production of Spaceport structure kits at the Structure Factory. The Spaceport may produce Single-Use Launch Vehicles (SULVs) and the EDWARD Satellite.			
<b>Stasis Systems</b>	Habitat Ring Health Maintenance	3600	18	Adv
Teaser	The cold-sleep system used in the 'Conestoga' successfully slowed the metabolic rate of the colonists traveling from Earth to New Terra, but at the cost of shortening their lives once they had arrived. Fortunately, our medical technology has advanced significantly since our arrival, and we believe we now have a method of inducing true suspended animation without the same loss of longevity.			
DESCRIPTION	The Stasis Systems contain suspended animation chambers for 200 colonists. This module, like the Habitat Ring, is equipped with our superconductive magnetic coil radiation shield system.			
Result	Allows production of the Stasis Systems at the Spaceport.			
<b>Vulcanology</b>	Seismology	2000	10	Std
Teaser	Recent volcanic activity on New Terra threatens our colony. To protect our colonists, we need to develop a method of predicting eruptions so that we can safely evacuate our colonists.			
DESCRIPTION	Using data from our planetary sciences database as well as investigations of volcanoes and magma vents here on New Terra, we have developed an early warning system that will accurately predict volcanic eruptions. Our dual-method monitoring system uses seismometers to measure rock movement that may indicate rising magma in the planet's crust and correlation spectrometers that measure sulfur dioxide in plumes rising out of volcanic craters.			
Result	Gives early warning of volcanic eruptions.			

## **Eden Research Lists for Weapons Systems and Combat Chassis**

### Weapons Systems

#### **Laser (1 topic)**

- Large-Scale Optical Resonators

#### **Starflare (4 topics)**

- Cybernetic Teleoperation
- Large-Scale Optical Resonators
- Mobile Weapons Platform
- Explosive Charges

#### **Rail Gun (11 topics)**

- Cybernetic Teleoperation
- Large-Scale Optical Resonators
- Metallogeny
- Research Training Programs
- High-Temperature Superconductivity
- Mobile Weapons Platform
- Advanced Vehicle Power Plant
- Independent Turret Power Systems
- Rare Ore Processing
- Advanced Combat Chassis
- Directional Magnetic Fields

#### **EMP (11 topics)**

- Cybernetic Teleoperation
- Large-Scale Optical Resonators
- Metallogeny
- Research Training Programs
- High-Temperature Superconductivity
- Mobile Weapons Platform
- Advanced Vehicle Power Plant
- Independent Turret Power Systems
- Rare Ore Processing
- Advanced Combat Chassis
- Electromagnetic Pulsing

#### **Acid Cloud (12 topics)**

- Cybernetic Teleoperation
- Large-Scale Optical Resonators
- Metallogeny
- Research Training Programs
- Seismology
- High-Temperature Superconductivity
- Mobile Weapons Platform
- Vulcanology
- Advanced Vehicle Power Plant
- Rare Ore Processing
- Advanced Combat Chassis
- Acid Weaponry

#### **Thor's Hammer (13 topics)**

- Cybernetic Teleoperation
- Large-Scale Optical Resonators
- Metallogeny
- Research Training Programs
- High-Temperature Superconductivity
- Mobile Weapons Platform
- Advanced Vehicle Power Plant
- Independent Turret Power Systems
- Rare Ore Processing
- Advanced Combat Chassis
- Directional Magnetic Fields
- Increased Capacitance Circuitry
- Artificial Lightning



## Combat Chassis

### Lynx (3 topics)

- Cybernetic Teleoperation
- Large-Scale Optical Resonators
- Mobile Weapons Platform

### Panther (9 topics)

- Cybernetic Teleoperation
- Large-Scale Optical Resonators
- Metallogeny
- Research Training Programs
- High-Temperature Superconductivity
- Mobile Weapons Platform
- Advanced Vehicle Power Plant
- Rare Ore Processing
- Advanced Combat Chassis

### Starship (17 topics)

- Cybernetic Teleoperation
- Health Maintenance
- Metallogeny
- Research Training Programs
- High-Temperature Superconductivity
- Rare Ore Processing
- Space Program
- Skydock
- Command Module

### Tiger (11 topics)

- Cybernetic Teleoperation
- Large-Scale Optical Resonators
- Metallogeny
- Research Training Programs
- High-Temperature Superconductivity
- Mobile Weapons Platform
- Advanced Vehicle Power Plant
- Rare Ore Processing
- Advanced Combat Chassis
- Reinforced Vehicle Construction
- Dual-Turret Weapons Systems

- Habitat Ring
- Ion Drive Module
- Orbital Package
- Sensor Package
- Fueling Systems
- Fusion Drive Module
- Stasis Systems
- Phoenix Module

## Plymouth Research

### Alphabetical Listing of Research Topics

Topic	Predecessor	Cost	Sci	Lab
<b>Advanced Armoring Systems</b>	Advanced Combat Chassis Enhanced Defensive Fortifications	3800	17	Adv
Teaser	The technologies developed by our space program have some spinoff applications on New Terra. One of these is an improvement to the armor systems we use on some of our vehicles.			
DESCRIPTION	Materials research done as part of our space program has resulted in an alloy well suited for use in combat vehicle armor.			
Result	Upgrades armor of Lynx (to Medium) and Panther (to Heavy).			
<b>Advanced Combat Chassis</b>	Advanced Vehicle Power Plant Mobile Weapons Platform Rare Ore Processing	2200	13	Adv
Teaser	While the Lynx has generally been a satisfactory design, it has proven to have a short life expectancy in combat. Our defenses require a heavier, more durable combat chassis.			
DESCRIPTION	The Panther medium combat chassis, based on the same vehicle body as the ConVec and Cargo Truck, is a heavier, better armored defender than its predecessor, the Lynx. Although slower than the Lynx, its greater durability in combat should improve our defenses.			
Result	Allows production of Panthers at the Vehicle Factory.			
<b>Advanced Robotic Manipulator Arm</b>	Robot-Assist Mechanic	3200	14	Std
Teaser	Certain units, such as the ConVec, use manipulator arms to accomplish complex tasks. Our cybernetic experts have a proposal for improving the flexibility and strength of these manipulator arms.			
DESCRIPTION	Several small refinements to the manipulator arms of these units, such as reconfigured joints, use of higher tensile strength metals in construction, and a software upgrade, add up to a substantial improvement in the production and repair rates of these units.			
Result	Improves the productivity of ConVecs, Earthworkers, Robo-Dozers, and Garage by 25 percent. (Improves structure kit deployment, Tube and Wall construction, repair, and bulldozing times.)			
<b>Advanced Vehicle Power Plant</b>	High-Temperature Superconductivity	1600	11	Std
Teaser	Several of the vehicle models we use are powered by the R-2000 cool-fusion plant. Our work in High-Temperature Superconductivity may be applicable to an improvement of this power plant.			
DESCRIPTION	The new R-3000 series cool-fusion plant has been installed in all Cargo Trucks, Robo-Dozers, Earthworkers, replacing the earlier R-2000 model. This application of the High-Temperature Superconductivity technology has increased the speed of these vehicles.			
Result	Improves Cargo Truck, Robo-Dozer, and Earthworker speeds.			
<b>Arachnid Durability</b>	Arachnid Weaponry	1800	14	Adv
Teaser	Our Arachnid units, while very useful, are too easily destroyed. This project seeks to increase the survivability of the Arachnids while maintaining their speed and low cost.			
DESCRIPTION	Our metallurgical staff has devised a lightweight steel alloy, which we are now using in the joint assemblies of our Arachnids. This leg reinforcement, as well as certain structural modifications to the bodies of the Arachnids, has produced a substantial increase in the durability of these units.			
Result	Increases Hit Points of Spider to 125 and of Scorpion to 150.			
<b>Arachnid Weaponry</b>	Focused Microwave Projection Legged Robots	1800	12	Adv
Teaser	The speed and low cost of the Spiders has led some of our Scientists to suggest that we build a second Arachnid model incorporating a weapon system.			
DESCRIPTION	The Scorpion, armed with a specially-adapted Microwave weapon, is a low-cost, high-mobility combat unit. Groups of Scorpions can quickly overwhelm enemy units.			
Result	Allows production of Scorpions at the Arachnid Factory.			
<b>Automated Diagnostic Examinations</b>	Health Maintenance	1000	8	Std
Teaser	The increase in our population is straining the capacity of our Medical Centers. We may be able to increase their capacity by automating some tasks.			
DESCRIPTION	A new type of robotic medical assistant has been developed which can perform many routine tasks at the Medical Center, allowing the staff to care for more patients.			
Result	Increases Medical Center capacity to 75 Colonists.			

<b>Command Module</b>	Skydock	4600	16	Adv
Teaser	Researchers combing through the partially-restored historical records in our databases have discovered a portion of the specifications for the bridge of the 'Conestoga.' This will speed our development of the command and control systems of the ship.			
DESCRIPTION	Several dozen Savant computer systems, working in parallel, make up the core of the Command Module. This is the most sophisticated computer system we have ever devised, capable of guidance control, power direction, and self-maintenance, without human intervention, for decades.			
Result	Allows production of the Command Module at the Spaceport.			
<b>Cybernetic Teleoperation</b>	none	1000	10	Std
Teaser	Prior to the evacuation from our original colony site, Workers remotely operated our vehicles using a technology called Teleoperation. Since the catastrophe, we no longer have enough Workers to Teleoperate our vehicles. The Savant computers at the Command Center have taken on part of this burden, but the job is taxing their capacity. We need a specialized computer vehicle control system. This Cybernetic Teleoperation project should allow us to operate a much larger number of vehicles.			
DESCRIPTION	Our research has resulted in a specialized variant of the Command Center, with dedicated computers and communications capabilities. In addition, all vehicle designs now include the less expensive Noesis computer, utilizing elements of the Savant technology. This transfers much of the computing burden from the Robot Command Center to the vehicle itself.			
Result	Allows production of Robot Command Center and Vehicle Factory structure kits at the Structure Factory.			
<b>DIRT Procedural Review</b>	Emergency Response Systems	1800	10	Std
Teaser	As our colony grows, more and more resources must be invested in DIRTs to maintain adequate protection. DIRT members have made several suggestions that may reduce this burden. A review of methods and procedures is in order.			
DESCRIPTION	Using suggestions made by DIRT members, our emergency response procedures have been improved. Among the improvements are an additional team member, redesigned power-assist armor, and a new type of structural breach patch.			
Result	Increases DIRT protection capacity to 15 structures; increases DIRT Worker requirement to 3.			
<b>Disaster-Resistant Housing</b>	Environmental Psychology	600	12	Std
Teaser	The increasing frequency and strength of the seismic events and atmospheric disturbances are making our Residence structures dangerous places to be. This project will seek to alter the design of the Residence to make it more able to withstand these dangers.			
DESCRIPTION	Rather than alter the existing Residence plan, we have designed a new Reinforced Residence, capable of withstanding more serious disaster. The original Residence structure is still available, at lower cost, for use in areas deemed to be less prone to seismic activity.			
Result	Allows production of the Reinforced Residence structure kit at the Structure Factory.			
<b>Dissipating Adhesives</b>	Mobile Weapons Platform	1600	10	Std
Teaser	One of our researchers, experimenting during his off-duty hours, discovered a peculiar substance: a foam that acted as a powerful adhesive, but evaporated after a short period of time. This is such a fascinating material that we would like to run some experiments on it to find potential applications.			
DESCRIPTION	StickyFoam is a powerful adhesive foam that evaporates after a short period of time. Our experiments to find a use for StickyFoam were largely unsuccessful, but we have developed the foam into a non-destructive weapon system. Enemy vehicles sprayed with StickyFoam will be immobilized briefly, allowing our units an opportunity to escape or bring up reinforcements.			
Result	Makes the StickyFoam weapon available.			
<b>Dual-Turret Weapons Systems</b>	Advanced Combat Chassis Reinforced Vehicle Construction	4200	18	Adv
Teaser	One of our research Scientists has proposed doubling the rate of fire of our combat units by installing a dual weapons turret. This may be just the decisive advantage we need to end this destructive conflict.			
DESCRIPTION	The dual-turret weapons systems are capable of twice the effective rate-of-fire of their single-turret predecessors, but duplicate only 70% of the components, sharing certain support systems. Due to their size, they can only be mounted on the Tiger heavy combat chassis, a tracked vehicle based on the Earthworker and Robo-Dozer designs.			
Result	Allows production of Tigers at the Vehicle Factory.			

<b>Efficiency Engineering</b>	Legged Robots Space Program	4000	18	Std
Teaser	All of our factories use a similar assembly-line method of production. Some of our factory workers, reading through the databases of industrial engineering techniques from Earth, have proposed a study of our factories, to look for possible increases in manufacturing efficiency.			
DESCRIPTION	Using time-and-motion analysis of the various production facilities, our researchers developed several new tools and techniques that reduced the production time of all products by 25%.			
Result	Reduces production time at the Arachnid Factory, Spaceport, Structure Factory, and Vehicle Factory by 25 percent.			
<b>Electromagnetic Pulsing</b>	Advanced Combat Chassis Independent Turret Power Systems	1400	11	Adv
Teaser	Since the early development of atomic weaponry, scientists have known about the disruptive effect of the electromagnetic pulse (EMP) on electronic circuitry. Our scientists believe they can use this knowledge to produce a defensive weapons system.			
DESCRIPTION	Electromagnetic pulse (EMP) grenades, fired from Guard Posts or combat chassis, produce a disruption in the power distribution circuitry of all vehicles or structures in range. This will briefly render the target inoperable.			
Result	Makes the EMP weapon available.			
<b>Emergency Response Systems</b>	none	1000	10	Std
Teaser	Given the new dangers confronting our colony, we need more protection against disaster than our emergency shelters are able to provide. This project will develop new methods, tools, and techniques to respond to structural damage.			
DESCRIPTION	Disaster Instant Response Teams (DIRTs) can reduce damage to structures. Once the DIRT structure has been deployed, DIRT members trained in emergency medical care and structural reinforcement will be on the scene in a matter of seconds.			
Result	Allows production of DIRT structure kits at the Structure Factory.			
<b>Enhanced Defensive Fortifications</b>	Focused Microwave Projection Rare Ore Processing	1800	12	Std
Teaser	With tensions increasing between the colonies, we must make our defenses as strong as possible.			
DESCRIPTION	The armor applied to our Guard Posts is now equal to that protecting our most vital structures.			
Result	Upgrades Guard Post armor to Heavy.			
<b>Environmental Psychology</b>	none	800	12	Std
Teaser	Environmental Psychology studies the relationships between human behaviors and the environments in which they occur. The forced evacuation of our old colony site has increased the stress on our Colonists; additional research in this field may help us to create a more supportive environment and improve Morale.			
DESCRIPTION	Our expanded knowledge of the causes and effects of crowding and environmental and situational stressors has enabled us to redesign our Residences. We can now house more people in the same space, while improving Morale.			
Result	Increases Residence capacity to 35 Colonists.			
<b>Explosive Charges</b>	Mobile Weapons Platform	1100	11	Std
Teaser	A simple and inexpensive weapons system could be developed by placing high explosive charges into a weapons turret. Although the vehicle would be destroyed by the detonation, the size of the charge could quickly incapacitate several enemy units at once.			
DESCRIPTION	The Starflare turret is a large trinitrotoluene (TNT) bomb, which may be placed on the Lynx or Panther combat chassis, or installed into a Guard Post. This high-explosive will damage all units within range.			
Result	Makes the Starflare weapon available.			
<b>Extended-Range Projectile Launcher</b>	Dissipating Adhesives Electromagnetic Pulsing Multiple-Mine Projectile System	4500	14	Adv
Teaser	Our after-action equipment performance reports show a weakness in the launch mechanism used in our EMP, ESG, and StickyFoam weapons turrets. Though this weakness does not cause an equipment failure, our engineers would like to revisit the design of this launcher.			
DESCRIPTION	The redesigned launch mechanism used in both of these weapons has lengthened the maximum range of these weapons.			
Result	Increases range of EMP to 7 and of StickyFoam and ESG to 6			
<b>Focused Microwave Projection</b>	none	1200	10	Std
Teaser	Inter-colonial relations remain poor, making it prudent to develop some kind of defensive capability. Our most promising research path lies in a refinement of the Microwave technology we use for transmitting power from our Tokamaks to the rest of the colony.			
DESCRIPTION	We have refined the technology used in transmitting power between structures. Our new emitters are capable of projecting a high-intensity beam of microwaves which will inflict heat damage on the target.			
Result	Makes the Microwave weapon available. Allows production of Guard Post structure kits			

		at the Structure Factory.			
<b>Forum Reconfiguration</b>		Public Performance	600	10	Std
Teaser		Demand for seating at our Forum events is running very high. A reconfiguration of the seating at the Forum would allow us to accommodate more colonists.			
DESCRIPTION		By redesigning the seats, reconfiguring the seating arrangement, and changing the shape of the stage, we can now accommodate more people at each Forum event.			
Result		Increases Forum capacity to 100 Colonists.			
<b>Fueling Systems</b>		Ion Drive Module	4600	16	Adv
Teaser		Because our starship will have a dual-propulsion system, it needs a dual fueling system. The Ion Drive will be fueled by liquid mercury, which must be gathered on New Terra. The Fusion Drive uses hydrogen as fuel. This may be gathered here, but our engineers suggest developing a fuel-gathering craft which can collect hydrogen from a planet's atmosphere.			
DESCRIPTION		The Fueling Systems consist of storage tanks for liquid mercury, used to fuel the Ion Drive, and the Fuel Shark, an autonomous ramscoop vehicle that dives into the outer layers of the planet's atmosphere to gather hydrogen fuel for the Fusion Propulsion system. The Fuel Shark will substantially reduce the number of launches necessary to prepare the starship for flight.			
Result		Allows production of the Fueling Systems at the Spaceport.			
<b>Fusion Drive Module</b>		Ion Drive Module	4600	16	Adv
Teaser		The Ion Drive we have developed is well-suited for use in interstellar space, but for travel within a solar system, a fusion motor will greatly reduce travel time.			
DESCRIPTION		Our fusion propulsion system plans are complete. The Fusion Drive Module contains both the fusion motor, used for high-acceleration in-system maneuvering, and the tanks which store the hydrogen fuel used in this motor. Once we have reached interstellar space, this fusion motor will provide power to the Ion Drive.			
Result		Allows production of the Fusion Drive Module at the Spaceport.			
<b>Grenade Loading Mechanism</b>		Extended-Range Projectile Launcher	3800	16	Adv
Teaser		Tests of the reloading mechanism in our grenade launching weapons, the EMP and Corrosive Acid have revealed some potential areas of improvement.			
DESCRIPTION		The hydraulic grenade loading mechanism used in some of our weapons turrets had been designed to handle ammunition that was much less shock-resistant than those we currently have in use. Increasing the 'rattle' tolerances of the system allows for a faster loading system.			
Result		Improves EMP and ESG rate of fire.			
<b>Habitat Ring</b>		Skydock	4600	16	Adv
Teaser		One of the greatest dangers of our interstellar voyage will be the bombardment of the starship with radiation and dust particles. We must develop some kind of protection against damage to the ship.			
DESCRIPTION		Before and after our interstellar flight, our colonists will live in the Habitat Ring. These temporary quarters are shielded from radiation and small particle collisions by a magnetic field generated by superconductive coils built into the hull.			
Result		Allows production of the Habitat Ring at the Spaceport.			
<b>Health Maintenance</b>		none	900	7	Std
Teaser		Although our emergency medical systems are adequate to deal with accidents and disasters, our people are suffering from a lack of regular medical care. We could exploit the vast medical knowledge in our databases to develop a regimen of health maintenance practices.			
DESCRIPTION		Medical Center personnel are trained in a variety of techniques of preventive medicine as well as the treatment of illness and injury. Each Medical Center can support the health needs of up to 40 colonists, improving the health and morale of the colony.			
Result		Allows production of Medical Center structure kits at the Structure Factory.			
<b>Heat Dissipation Systems</b>		Focused Microwave Projection	3500	14	Adv
Teaser		Our Microwave weapon systems generate high levels of heat when repeatedly fired in combat, requiring a cooling-off period before they can be fired again. This delay could be shortened by adding a heat dissipation system.			
DESCRIPTION		Our new weapons turret heat sinks allow the Microwave to be fired more quickly. The heat sinks use dichlorodifluoromethane gas as a coolant to prevent weapon overheating.			
Result		Increases Microwave rate of fire.			
<b>High-Powered Explosives</b>		Explosive Charges Rocket Propulsion	1500	12	Std
Teaser		The proven effectiveness of the Starflare weapon has led our scientists to propose a more powerful version. We have several formulas for chemical explosives more powerful than trinitrotoluene, but testing is required to determine which is most suitable for use as a reliable weapon.			
DESCRIPTION		A new explosive material, pentaerythritol tetranitrate (PETN), has been developed. PETN is about 1.6 times as the material used in our Starflare weapons. Our RPG weapons systems have been upgraded to use PETN.			
Result		Makes the Supernova weapon available. Increases RPG concussion damage to 100, and penetration damage to 45.			

<b>High-Temperature Superconductivity</b>	Research Training Programs	1200	11	Adv
Teaser	Superconductivity is the ability of certain materials to conduct electric current with no resistance and extremely low losses. The best superconductive materials we have require an operating temperature of 152 degrees Kelvin (-121 degrees Celsius). Many new applications could be developed with a significant increase in the temperature of superconduction.			
DESCRIPTION	Our research into High-Temperature Superconductivity has resulted in the discovery of an alloy that is superconductive at 236 degrees Kelvin (-37 degrees Celsius), over 80 degrees higher than our previous superconductors, improving power generation at our Tokamaks.			
Result	Increases Tokamak Power output to 300.			
<b>Hot-Cracking Column Efficiency</b>	Metals Reclamation Rare Ore Processing	1400	14	Std
Teaser	Smelters and GORFs are dependent on hot cracking columns to separate the Metal content of Ores or rubble. This equipment has a very high Power demand. We believe that we may be able to apply our high-temperature superconductive material to some elements of this system and reduce the Power demand.			
DESCRIPTION	Common Ore Smelter, Rare Ore Smelter, and GORF Power requirements reduced.			
Result	Reduces Common Ore Smelter, Rare Ore Smelter, and GORF Power requirements to 40 units each.			
<b>Hydroponic Growing Media</b>	none	1600	11	Std
Teaser	Our Agridomes use a variety of methods, including Hydroponics (soilless farming) to fill our Food requirements. Some of our Agricultural Workers have ideas on ways to improve the growing medium in which our Hydroponic crops are grown.			
DESCRIPTION	By adjusting the nutrients in the liquid in which our hydroponic crops are grown, we have been able to increase production at our Agridomes by 25%.			
Result	Increases Food production to 50 units.			
<b>Hypnopaedia</b>	Research Training Programs	1000	10	Std
Teaser	As our research projects become more complex, we need to improve our methods of training scientists. Hypnopaedia, or sleep-learning, is a method we plan to investigate.			
DESCRIPTION	Our hypnopaedia project has borne limited fruits. Sleep-learning is useful only in reducing the time required for memorization. This is helpful in that a large part of our research training requires knowledge of what types of research are described in our scientific databases.			
Result	Reduces points required to train Scientists to 4500 (2250 in multiplayer).			
<b>Independent Turret Power Systems</b>	High-Temperature Superconductivity Mobile Weapons Platform	1800	12	Adv
Teaser	Our weapons turrets currently feed off the Lynx cool-fusion power plant. Because of the other demands on this power system, the amount of power that is available to the weapon is limited. Our research project will develop an independent power source for weapons turrets.			
DESCRIPTION	The R-10 cool-fusion power cell, just developed, is a small but powerful generator designed to fit into the weapons turret on our Lynx combat vehicles. This replaces the power feeds from the Lynx' own cool-fusion plant, and makes possible other, more powerful weapons systems.			
Result	Increases Microwave concussion and penetration damage to 30 each.			
<b>Ion Drive Module</b>	Skydock	4600	16	Adv
Teaser	While the main drive of the 'Conestoga' was a less capable fusion drive, it appears that an improved ion propulsion system was developed shortly before launch and used in some thruster systems. Development of an Ion Propulsion interstellar drive will be a substantial step in our starship program.			
DESCRIPTION	The ion motor is a low-thrust/long-duration system which will be activated once the ship reaches interstellar space. The Ion Drive Module contains this interstellar drive as well as supplemental ion and chemical guidance thrusters to be attached to the starship.			
Result	Allows production of the Ion Drive Module at the Spaceport.			
<b>Lava Defenses</b>	Rare Ore Processing Vulcanology	1200	12	Adv
Teaser	Volcanic eruptions continue to pose a substantial danger. We must find some way of routing these lava flows away from the colony.			
DESCRIPTION	In our search for a way to reduce the threat of volcanic eruptions, we have found a material that can, at least temporarily, resist the intense heat of a lava flow. This material, sprayed on a wall built of heavily-compressed regolith, can delay the approach of lava to our structures, giving us more time to evacuate.			
Result	Allows Earthworkers to deploy Lava Walls.			

<b>Legged Robots</b>	Cybernetic Teleoperation High-Temperature Superconductivity	1800	14	Std
Teaser	As we move into areas with rougher terrain, our robotics staff has proposed research into robots that use legged locomotion rather than wheeled. Robots with legs would be more agile and therefore less affected by terrain than our existing vehicles.			
DESCRIPTION	Our new 'Arachnid' robotics factory can produce robots that move on legs rather than wheels. These smaller Spider vehicles are inexpensive and agile, and can be used to repair other vehicles and structures.			
Result	Allows production of Arachnid Factory structure kits at the Structure Factory. Arachnid Factories may produce Spiders.			
<b>Leisure Studies</b>	Environmental Psychology	500	7	Std
Teaser	Our colonists are asking for additional entertainment options for their off-duty hours. This project proposes to tap the humanities database for possible leisure-time activities.			
DESCRIPTION	Our leisure studies project has produced a number of activities, for both individuals and groups, that will amuse, entertain, and stimulate our colonists. Recreation facility personnel are trained to organize physical exercise classes, games, and tournaments, and to teach various handicrafts.			
Result	Allows production of Recreation Facility structure kits at the Structure Factory.			
<b>Magnetohydrodynamics</b>	Rare Ore Processing	2200	12	Std
Teaser	For several years now, New Terra's magnetic field has been in a state of flux. This appears to be a natural process; it is believed to have happened a number of times in Earth's past, though not during recorded history. This is a fascinating opportunity to study a rare geologic phenomenon.			
DESCRIPTION	Our studies of New Terra's shifting magnetic field have produced a serendipitous side benefit. We have discovered a way to harness the shifts through electromagnetic induction, producing a substantial amount of electrical power.			
Result	Allows production of MHD Generator structure kits at the Structure Factory.			
<b>Metallogeny</b>	none	1200	11	Std
Teaser	Metallogeny is the branch of geology that seeks to define the relationship between the geological history of an area and its mineral deposits. Metallogenic research is aimed at achieving a better understanding of the nature and geological settings of base and precious metal deposits, and to use this understanding to help develop areas of high mineral potential.			
DESCRIPTION	Our Metallogenic research has developed a new technique of locating and exploiting veins of Ore. This new method has increased Common Ore production.			
Result	Increases Common Ore Mine yield by 20 percent.			
<b>Metals Reclamation</b>	none	900	7	Std
Teaser	With our growing needs, we can no longer afford to overlook any possible sources of Metals. A few adaptations to our current Smelter technology may enable us to reclaim some of the materials in structures we no longer need.			
DESCRIPTION	The Garbage and Ore Recycling Facility (GORF) uses a variant of the hot-cracking technology used at the Common Ore Smelter to extract usable Metals from deconstructed structures, unneeded structure kits, and rubble.			
Result	Allows production of GORF structure kits at the Structure Factory.			
<b>Meteor Detection</b>	Skydock	1600	12	Std
Teaser	After the recent meteorite impacts, our observations have found that more are to come. New Terra is entering a field of debris, probably caused by the collision of two asteroids. We need a way to track this debris so we can have some advance warning of meteorite impacts.			
DESCRIPTION	Our Skydock facility has been fitted with a series of telescopes to look for incoming meteors. This should give us some warning before they fall.			
Result	Gives early warning of meteor strikes.			
<b>Meteorology</b>	Vulcanology	1500	11	Std
Teaser	Although there have always been electrical discharges in the New Terran atmosphere, the atmosphere's low pressure caused these discharges to be manifested as sudden glows, rather than lightning strikes as on Earth. Now, with the thickening of the atmosphere, dangerous lightning is becoming more of a danger. We need to study these strikes so that we can predict their occurrence and take precautions.			
DESCRIPTION	We now understand the atmospheric conditions that lead to filamentous, or arc, lightning discharges in the New Terran atmosphere, and can predict their occurrence. On Earth, collisions between water particles of varying sizes caused the build-up of an electrical charge in the atmosphere. Negatively-charged particles in storm clouds were attracted to the positively-charged ground. The process is similar on New Terra, except that instead of water particles colliding, we have dust particles colliding.			
Result	Gives early warning of electrical storms.			

<b>Mobile Weapons Platform</b>	Cybernetic Teleoperation Large-Scale Optical Resonators	1600	12	Adv
Teaser	While our Command Center staff is quite pleased with the new Guard Post structures, they point out that our defenses are rather inflexible, due to their lack of mobility. At their suggestion, our Scientists have outlined a project for developing a mobile weapons platform.			
DESCRIPTION	The 'Lynx' light combat chassis is a design adapted from existing vehicles. The Lynx includes light armor-plating and a weapons hard point, to which any kind of turret may be attached.			
Result	Allows production of Lynx at the Vehicle Factory.			
<b>Multiple Mine Projectile System</b>	Advanced Combat Chassis Independent Turret Power Systems	1800	12	Std
Teaser	A young Scientist interning at a Standard Lab before our last evacuation, read in the historical database about an interesting weapons system used on Earth. The weapon launched a projectile that split into several smaller weapons upon impact. We believe we could develop such a defensive system.			
DESCRIPTION	Our new ESG weapons launch a single projectile, but on impact it splits into several small mines that are scattered around the impact location. These mines release an electrostatic discharge at the first enemy unit that approaches them.			
Result	Makes the ESG weapon available.			
<b>Multitainment Console Upgrade</b>	Leisure Studies	400	9	Std
Teaser	The demands on our Recreation Facilities have grown even as our colony has grown. This project hopes to ease the situation by improving the multitainment consoles so many of our colonists use during their off-duty hours.			
DESCRIPTION	Our improved Multitainment Consoles are smaller and less expensive, while maintaining their high performance level. The number of units included in the Recreation Facility design has been increased, allowing the facility to serve more colonists.			
Result	Increases Recreation Facility capacity to 60 Colonists.			
<b>Offspring Enhancement</b>	none	300	6	Std
Teaser	With our population dwindling, we must find ways of increasing our numbers. This project is designed to find ways of increasing the birth rate as well as improving the health of our children.			
DESCRIPTION	Based on the data developed in the Human Genome Project, completed a few years before the destruction of Earth, our Offspring Enhancement program includes selection of genetically superior children from our gene banks, in vitro gestation, and fertility enhancement.			
Result	Allows production of Nursery structure kits at the Structure Factory.			
<b>Orbital Package</b>	Skydock	4600	16	Adv
Teaser	Upon arrival at our new home, we want to deploy a series of satellites and probes that will provide data about the planet and support colony operations.			
DESCRIPTION	This group of satellites and probes, to be deployed upon reaching our destination planet, includes EDWARD, a communications satellite, a solar power satellite, orbital observers, and several types of atmospheric and geologic probes.			
Result	Allows production of the Orbital Package at the Spaceport.			
<b>Phoenix Module</b>	All other Starship Components <sup>2</sup>	4600	16	Adv
Teaser	Before we land our colonists on the new planet, we must send a lander to prepare the early stages of a colony. We have in our databases portions of the plans for the Seed Factory used on our arrival on New Terra, but they are incomplete and obsolescent.			
DESCRIPTION	When deployed, this self-contained lander transforms into several of the initial structures and vehicles needed to start a colony. These structures are all capable of operation without human presence, and will give our new home a head start.			
Result	Allows production of the Phoenix Module at the Spaceport.			
<b>Public Performance</b>	Leisure Studies	800	8	Std
Teaser	Many of our colonists have been exploring the entertainment databases brought from Earth during their off-duty hours. Some have proposed putting on dramatic presentations, musical concerts, and similar entertainments as a method of raising morale. Unfortunately, we have no facilities in which such events could be presented.			
DESCRIPTION	This entertainment facility provides sufficient seating for performances of concerts, plays, poetry readings, and public meetings.			
Result	Allows production of Forum structure kits at the Structure Factory.			

<sup>2</sup> These include: Command Module, Fueling Systems, Fusion Drive Module, Habitat Ring, Ion Drive Module, Orbital Package, Sensor Package, Skydock, and Stasis Systems.



<b>Rare Ore Extraction</b>	Rare Ore Processing	4300	17	Adv
Teaser	Our Rare Ore mining facilities have had only moderate success at finding the best methods of extracting higher grades of Rare Ore. Several proposals have been put forward to improve our efficiency.			
DESCRIPTION	Our project has met with limited success. We have developed two new processes that determine the Rare Metal content of certain gangue materials, such as quartz, and eliminate specimens containing only trace amounts of Rare Metal.			
Result	Increases Rare Ore Mine yield by 20 percent.			
<b>Rare Ore Processing</b>	Cybernetic Teleoperation High-Temperature Superconductivity Metallogeny	2600	16	Adv
Teaser	Since our arrival on New Terra, we have encountered a number of sites that are rich in rare mineral deposits, but we have had neither applications which called for Rare Metals nor methods of processing these Rare Ores. Now, our scientists have a number of projects they wish to undertake which would require Rare Metals.			
DESCRIPTION	Rare Metals will be a great asset to us. These metals can be used in several new research projects.			
Result	Allows production of Rare Ore Smelter and Rare Metals Storage Tanks structure kits at the Structure Factory, and allows Robo-Miners to deploy as Rare Ore Mines. Increases Robo-Miner production costs to 700 Common Metals			
<b>Recycler Postprocessing</b>	Metals Reclamation	1800	10	Std
Teaser	The hot-cracking column used in our GORFs successfully reclaims approximately 50% of the Metals content of materials. We have some theories about a secondary process that can recover additional metals from the remaining slag.			
DESCRIPTION	Metals recovered through recycling increased.			
Result	Increases Metals recovered through recycling.			
<b>Reduced Foam Evaporation</b>	Dissipating Adhesives	1800	12	Std
Teaser	Although the immobilizing effect of StickyFoam is very useful, its evaporation rate is inconveniently short. We propose to slow the evaporation rate of the Foam by introducing certain chemical stabilizing elements.			
DESCRIPTION	We have added stabilizers and thickeners to our StickyFoam formula that causes the Foam to evaporate more slowly, without losing its adhesiveness.			
Result	Increases StickyFoam duration by 50 percent.			
<b>Reinforced Vehicle Construction</b>	Rare Ore Processing	1400	12	Std
Teaser	The Cargo Truck, and some similar vehicles, have shown themselves to be all too vulnerable to damage from disasters, explosions, and attacks. Through the use of new composite alloys incorporating Rare Metals, we can increase their durability.			
Description	The durability of these vehicles has been improved through a combination of revised construction and the use of a composite alloy incorporating Rare Metals.			
Result	Increases Hit Points and changes production costs of ConVecs, Cargo Trucks, and Evacuation Transports.			
		<b>Cargo Truck</b>	<b>ConVec</b>	<b>Evacuation Transport</b>
	<b>Hit Points</b>	750	375	280
	<b>Common Metals cost</b>	500	1000	650
	<b>Rare Metals cost</b>	100	150	100
<b>Reinforced Panther Construction</b>	Advanced Combat Chassis Reinforced Vehicle Construction	2000	11	Adv
Teaser	The composite alloy developed in our Reinforced Vehicle Construction project may be beneficial for our Panther combat chassis as well.			
DESCRIPTION	A redesign of the Panther using a new composite alloy has increased the durability of this combat chassis.			
Result	Increases Panther Hit Points to 700; changes production costs to 300 Common Metals and 150 Rare Metals.			
<b>Research Training Programs</b>	none	300	5	Std
Teaser	A lack of trained workers and scientists is hampering our colony's efforts. We need to develop a curricula that will educate our workforce and expand our research staff.			
DESCRIPTION	Our new educational curriculum for training scientists includes intensive class work, independent study with Savant computers, VR simulations, and internships at the research labs.			
Result	Allows production of University and Advanced Lab structure kits at the Structure Factory.			
<b>Robot-Assist Mechanic</b>	Cybernetic Teleoperation	800	6	Std
Teaser	Our cybernetics experts have proposed a new robot that can be used in repairing vehicles.			
DESCRIPTION	Robot-Assist Mechanics, installed at the Garage, are capable of doing most vehicle repairs.			
Result	Allows production of Garage structure kits at the Structure Factory.			

<b>Robotic Image Processing</b>	Cybernetic Teleoperation	1600	12	Std
Teaser	The visual recognition systems of our robotic vehicles have a limited useful range, partially due to the limitations of the image processing software. Some of our programmers have a possible solution.			
DESCRIPTION	Through a combination of improved image processing software and increased zoom telescoping vision systems, the visual recognition range of certain units has been improved.			
Result	Improves sight ranges of Light Tower (to 9), Guard Post (to 9), and Scout (to 8).			
<b>Rocket Atmospheric Re-entry System</b>	Electromagnetic Pulsing Space Program	4500	14	Adv
Teaser	Our SULVs have been designed to launch payloads into orbit, but the only portion which returns to New Terra is the nose cone containing the crew. With some modification, it may be possible to assemble a new model of SULV that can re-enter the atmosphere.			
DESCRIPTION	Our missile re-entry program has had limited success. We have developed an EMP missile that can be launched at the Eden colony and disable their units in a wide area.			
Result	Allows production of EMP Missiles at the Spaceport.			
<b>Rocket Propulsion</b>	Advanced Combat Chassis Independent Turret Power Systems	2000	12	Adv
Teaser	Some of our colonists, reviewing late twentieth century military history, have expressed an interest in rocket propulsion as a means to a new weapons system.			
DESCRIPTION	Our rocket propulsion project, has produced a new defensive system, using Rocket Propelled Grenades (RPGs) to deliver an explosive charge.			
Result	Makes the RPG weapon available.			
<b>Scorpion Power Systems</b>	Arachnid Weaponry	1800	14	Adv
Teaser	The weapons on the Scorpion are just not powerful enough. We believe we can increase the amount of damage they do by improving the Scorpion's power system.			
DESCRIPTION	By installing a slightly larger power system in the Scorpion, we have increased its combat effectiveness substantially.			
Result	Increases Scorpion penetration damage to 30.			
<b>Scout-class Drive Train Refit</b>	Mobile Weapons Platform	1800	12	Std
Teaser	The Scout, and some similar vehicles, use the G-75 drive train. We have discovered a design flaw in the G-75 that impairs its efficiency. This project would redesign the G-75 to make it more effective.			
DESCRIPTION	The G-75 drive train used in these three vehicles has been replaced by the G-80 model, which improved vehicle speed through a more efficient transfer of energy from the power plant to the wheels.			
Result	Increases Scout, Robo-Surveyor, and Lynx speeds.			
<b>Seismology</b>	none	1500	11	Std
Teaser	Our previous research on the geology of New Terra indicated that the planet was not subject to seismic activity; recent events, however, have changed the situation. Our planetary sciences database shows that seismologists had developed methods of seismic event prediction on Earth; some of these techniques may be adaptable to New Terra.			
DESCRIPTION	We have developed equipment to detect certain hydrogeochemical early warning signals of seismic events. Among the most reliable indicators are variations in the concentration of radon and carbon dioxide in the molten salts found in deep bore wells or in fumaroles. These warnings should give us some time to idle structures in the vicinity of the epicenter, reducing damage to them.			
Result	Gives early warning of seismic events.			
<b>Sensor Package</b>	Skydock	4600	16	Adv
Teaser	Our starship must have a remote sensing system, which will serve two purposes. First, it must help us avoid collision with asteroids and other large objects. Second, it will receive data from interstellar probes we send out to find our new home.			
DESCRIPTION	Before we can depart the New Terra system, we must have a destination. Our Sensor Package includes a Nanoprobe launcher, capable of sending thousands of microbe-sized probes toward potentially habitable planets, and a sensor/telemetry system which will evaluate the reports sent back by the Nanoprobes.			
Result	Allows production of the Sensor Package at the Spaceport.			
<b>Severe Atmospheric Disturbances</b>	Meteorology	15000	12	Std
Teaser	The vortexes we have been experiencing are a new phenomenon on New Terra; we must study these severe storms to determine how they are caused and how to predict them.			
DESCRIPTION	The vortexes start in a manner similar to the 'dust-devils' common on Earth and Mars. Ground-level air, heated by sunlight, rises. Cooler air rushes into the area that the warmer air has left, but from there, the spinning column of air is enhanced and focused by a yet-unknown process which may be electromagnetic in nature. While our understanding is limited, we can now forecast conditions that will lead to their formation, and have developed technologies for early detection.			
Result	Gives early warning of vortexes.			

<b>Skydock</b>	Space Program	4600	16	Adv
Teaser	Our Skydock will function as an orbital command post. In addition to docking facilities for our launch vehicles ferrying components and technicians, it serves as a command and control facility for construction of our starship.			
DESCRIPTION	Now that we have regained space launch capabilities, we can begin construction of a new starship. The first step is an orbital station from which we can start deploying components of the ship.			
Result	Allows production of the Skydock at the Spaceport.			
<b>Smelter Postprocessing</b>	Rare Ore Processing Recycler Postprocessing	4300	17	Adv
Teaser	The chemical postprocessing technique we developed for improving metals reclamation at the GORF may be adaptable for use at our Common Ore and Rare Ore Smelters.			
DESCRIPTION	We have successfully adapted the chemical postprocessing treatment used at the GORF to improve the yield of our Smelters.			
Result	Increases Common Ore Smelter and Rare Ore Smelter production.			
<b>Solar Power</b>	Space Program	3700	16	Adv
Teaser	The technology behind solar power has been available for quite some time, the size of the solar collector panels needed to generate a significant amount of power has always been judged prohibitive, especially since our periodic evacuations began. However, with the redevelopment of a space program, it is possible to build a solar collector satellite which beams the energy it collects to a ground-based receiver.			
DESCRIPTION	The solar power system, comprised of a collector satellite and ground-based receiver, is an inexpensive alternative energy source. The satellite, once in orbit, can be retargeted at a new ground location after an evacuation, and the receivers are much less volatile than our Tokamak fusion reactors.			
Result	Allows production of the Solar Power Array at the Structure Factory and the Solar Power Satellite at the Spaceport.			
<b>Space Program</b>	Rare Ore Processing	4600	16	Adv
Teaser	Many of our colonists feel, now that our colony is beginning to grow, that it would be wise to start another starship project. Having colonies on separate planets would help to ensure the survival of humanity.			
DESCRIPTION	Our space program is underway. As an initial cargo, we have developed the Early Disaster Warning and Resource Detection (EDWARD) satellite.			
Result	Allows production of Spaceport structure kits at the Structure Factory. The Spaceport may produce Single-Use Launch Vehicles (SULVs) and the EDWARD Satellite.			
<b>Spider Maintenance Software Revision</b>	Legged Robots	1600	12	Std
Teaser	Bugs in the software controlling our Spiders' repair function are impairing its ability to make repairs on structures and vehicles. Although the Spiders are adequately performing this function, we believe we can make some improvements.			
DESCRIPTION	Spider Maintenance Software version 1.32 has been installed in all Spider units, fixing some inadequacies in the damage diagnostics and repair procedures routines.			
Result	Improves Spider repair rate by 25 percent.			
<b>Stasis Systems</b>	Habitat Ring Health Maintenance	4600	18	Adv
Teaser	The cold-sleep system used in the 'Conestoga' successfully slowed the metabolic rate of the colonists traveling from Earth to New Terra, but at the cost of shortening their lives once they had arrived. Fortunately, our medical technology has advanced significantly since our arrival, and we believe we now have a method of inducing true suspended animation without the same loss of longevity.			
DESCRIPTION	The Stasis Systems contain suspended animation chambers for 200 colonists. This module, like the Habitat Ring, is equipped with our superconductive magnetic coil radiation shield system.			
Result	Allows production of the Stasis Systems at the Spaceport.			
<b>Vulcanology</b>	Seismology	1300	10	Std
Teaser	Recent volcanic activity on New Terra threatens our colony. To protect our colonists, we need to develop a method of predicting eruptions so that we can safely evacuate our colonists.			
DESCRIPTION	Using data from our planetary sciences database as well as investigations of volcanoes and magma vents here on New Terra, we have developed an early warning system that will accurately predict volcanic eruptions. Our dual-method monitoring system uses seismometers to measure rock movement that may indicate rising magma in the planet's crust and correlation spectrometers that measure sulfur dioxide in plumes rising out of volcanic craters.			
Result	Gives early warning of volcanic eruptions.			

## Research Lists for Weapons Systems and Combat Chassis

### Weapons Systems

#### Microwave (1 topic)

- Focused Microwave Projection

#### Starflare (4 topics)

- Cybernetic Teleoperation
- Focused Microwave Projection
- Mobile Weapons Platform
- Explosive Charges

#### StickyFoam (4 topics)

- Cybernetic Teleoperation
- Focused Microwave Projection
- Mobile Weapons Platform
- Dissipating Adhesives

#### EMP (11 topics)

- Cybernetic Teleoperation
- Focused Microwave Projection
- Metallurgy
- Research Training Programs
- High-Temperature Superconductivity
- Mobile Weapons Platform
- Advanced Vehicle Power Plant
- Independent Turret Power Systems
- Rare Ore Processing
- Advanced Combat Chassis
- Electromagnetic Pulsing

#### RPG (11 topics)

- Cybernetic Teleoperation
- Focused Microwave Projection
- Metallurgy
- Research Training Programs
- High-Temperature Superconductivity
- Mobile Weapons Platform
- Advanced Vehicle Power Plant
- Independent Turret Power Systems
- Rare Ore Processing
- Advanced Combat Chassis
- Rocket Propulsion

#### ESG (11 topics)

- Cybernetic Teleoperation
- Focused Microwave Projection
- Metallurgy
- Research Training Programs
- High-Temperature Superconductivity
- Mobile Weapons Platform
- Advanced Vehicle Power Plant
- Independent Turret Power Systems
- Rare Ore Processing
- Advanced Combat Chassis
- Multiple Mine Projectile System

#### Supernova (13 topics)

- Cybernetic Teleoperation
- Focused Microwave Projection
- Metallurgy
- Research Training Programs
- High-Temperature Superconductivity
- Mobile Weapons Platform
- Explosive Charges
- Advanced Vehicle Power Plant
- Independent Turret Power Systems
- Rare Ore Processing
- Advanced Combat Chassis
- Rocket Propulsion
- High-Powered Explosives

## Combat Chassis

### Lynx (3 topics)

- Cybernetic Teleoperation
- Focused Microwave Projection
- Mobile Weapons Platform

### Panther (9 topics)

- Cybernetic Teleoperation
- Focused Microwave Projection
- Metallogeny
- Research Training Programs
- High-Temperature Superconductivity
- Mobile Weapons Platform
- Advanced Vehicle Power Plant
- Rare Ore Processing
- Advanced Combat Chassis

### Starship (17 topics)

- Cybernetic Teleoperation
- Health Maintenance
- Metallogeny
- Research Training Programs
- High-Temperature Superconductivity
- Rare Ore Processing
- Space Program
- Skydock
- Command Module

### Tiger (11 topics)

- Cybernetic Teleoperation
- Focused Microwave Projection
- Metallogeny
- Research Training Programs
- High-Temperature Superconductivity
- Mobile Weapons Platform
- Advanced Vehicle Power Plant
- Rare Ore Processing
- Advanced Combat Chassis
- Reinforced Vehicle Construction
- Dual-Turret Weapons Systems

- Habitat Ring
- Ion Drive Module
- Orbital Package
- Sensor Package
- Fueling Systems
- Fusion Drive Module
- Stasis Systems
- Phoenix Module