Appendix TECH – Technology Progress

General Technology Process in GGDM:

- ✓ Technology is advanced only by activation of the Technology Power. The Technology Power is non-location specific and generally cannot fail Power Activation.

- ✓ Technology advances through three stages in GGDM: Research, Development and Patent Prosecution.

- ✓ Technology advancement in GGDM should be thought of generally as leaps and bounds (e.g., from Babbage's Analytical Machine to the Quantum Computer) and not as simply developing a new flavor of Kool-Aid to market next summer.

- ✓ Technology in all stages is subject to being stolen or copied by others.

Research Groups:

- ✓ Successful Research results in receiving a Research Piece that is placed on the Public space.[1]

- ✓ Research is conducted into one of ten areas:

Energy	Stardrive
Matter	Ships
Information	Weapons
Life	Defenses
Planets	Industry

- ✓ Two adjacent Research Pieces of the same type are required to form a Research Group which is required for Development. Research Groups can overlap and be adjacent.

- ✓ Research Pieces and Groups occupy Monads on the Public Space until advanced or lost. There is generally no way to remove Research Pieces or Groups until they are successfully Developed; though they may sometimes fall victim to shifting Pathways or Concierge Interventions. Thus, placing a Research Piece on the Public Space is a commitment to follow-through to Development.

- ✓ One Research Piece of a Group must be adjacent to a Friendly or Naturalized Colony that has an active Epistemological Constructural Element. If that is not the case, the Research Group is disrupted and not eligible for Development.

- ✓ Research is RP intensive, and may exceed the current Treasury. Research Pieces are not received until fully funded, this may compromise future research.

- ✓ Research is also the most chance-dependent part of the technology progress in GGDM.

Developing Applications:

- ✓ Successful Development results in removing a Research Group from the Public Space and placing a new Application of the same type on the current Era Matrix in a currently open location.[2]

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[1] See generally 2 Technology.
[2] See generally 2 Technology.

✓ By Development, technology is removed from the dangers of disruption or loss on the Public Space to the current Era Matrix where no disruptions or losses occur.

✓ One activation of the Technology Power for the purpose of Development is sufficient to develop a Research Group into an Application until such time as it is either successful, or it runs out of open spaces on the current Era Matrix or the Research Group becomes disrupted or lost on the Public Space by other means.

✓ Each Development failure permanently blocks the Research Group from being placed in that location on the current Era Matrix, thus unfortunate development chances may block out a Research Group from the current Era Matrix.

✓ RP cost of the Development is the number of locations specified times the current Era squared, which is fully deducted from the Treasury on the first turn of Development.

✓ Overall, Research is more RP and chance intensive, whereas Development is more time consuming, but probably costs less RPs.

Normal Patent Prosecution:

✓ Patents must follow a form and are official Interpretations that create both the physical laws of the game universe for all and a playable technology in the game.[3]

✓ GGDM Patents are different from real-world Patents, they must work because they impose technology and physical laws on the game. One does not have to prove a real-world patent works as long as it does not violate known natural laws; GGDM Patents almost always violate known natural laws as they are currently known.

✓ The governor of the Patent is the Operational Quality which describes what the Patent is supposed to do, and the constraints on the Patent.[4] There are four Operational Qualities: Physical Item Technologies (PITs), Continuous Operational Technologies (COTs), Enhancement Technologies (ETs) and Technological Devices (TD).

   o See Appendix POQ – Patent Operational Qualities.

✓ Prospective Patents are subject to Concierge approval for game purposes; the Concierge is both advisory and adversarial to the Patent process, just like the USPTO.[5]

✓ Patent Prosecution requires that all of the Applications listed on the Patent be connected on the current Era Matrix and that they appear in the exact order shown on the Patent.[6] Unconnected Applications will be tested; a Patent could be created solely from already connected Applications or begin with some connected and some not.

✓ Connections made are permanent, but a Patent will fail prosecution if any two of its Applications remain unconnected.

✓ Patent Prosecution costs no RPs; failed Patents may be altered and/or resubmitted by subsequent Technology Power Activations. A successful Patent is locked however, cannot be changed. Patents cannot be disrupted either.

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[3] See generally, 1 Patents.
[4] See generally, 2 Patents.
[5] See generally, 2 Patents.
[6] See generally, 3 Patents.

Stardrive Patents:

- ✓ Faster than light travel – Stardrive Technology – is the singular entry point for the game's civilizations, it is the essential of the setting and the mark of entry to the 1st Era of inter-stellar technology. Generic Stardrive Existential Patent is required for most of the Primal States during game set-up[7] and no ships may be purchased or constructed without a Star-drive Patent.[8]

- ✓ GGDM allows multiple, competing FTL systems to co-exist in the universe.

- ✓ Stardrive Patent prosecution is different from normal Patent Prosecution in that it de-pends on the average of the percent of Applications completed and the percent of Appli-cation connections on the current Era Matrix.[9] Stardrive Patent Prosecution is thus has a better chance or is more efficient, late in an Era.

- ✓ Stardrive Patents must describe a formula for how the ship moves.[10]

- ✓ Ship speed may be increased in increments of one by use of COT Patents.[11]

- ✓ Successful Stardrive Patent Prosecution is required to exit the 1st Era for which the Ge-neric Stardrive Patent may serve.[12]

- ✓ Positions are limited to one successful Stardrive Patent prosecution per Era (except in the 1st Era for positions that did not begin with the Generic Stardrive (GSD) Existential Pa-tent) and each ship may have only one type of Stardrive.[13]

Advanced Research & Development:

- ✓ The normal technology progress rules assume Research, Development, and Patent Prose-cution are being conducted in the current Era. Era advancement occurs periodically when conditions for advancement are fulfilled, mainly, having filled all locations on the current Era Matrix and connected all Applications at least once.[14]

- ✓ It is possible to conduct Advanced Development and Advanced Patent Prosecution in the next Era, which is very expensive and depends highly upon the number of Applications in the current Era.[15] Stardrive Patents can never be prosecuted as Advanced Patents. Further, unless the game will have a 4th Era (which is optional), advanced research is not possible after reaching the 3rd Era; advance research is not possible in whatever is the fi-nal Era of the game.

- ✓ Upon advancing properly to the 2nd and 3rd Eras, the position will receive the benefits of the Uber Alles for the position and other possible benefits,[16] but cannot receive them by Advanced Development and Advanced Patent Prosecution.

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[7] See generally 6 Beginnings.
[8] See Stardriven, 7 Beginnings, p. 72.
[9] See Stardrive Patent Prosecution, 2 Stardrive, p. 796.
[10] See How it Moves and Blurry Hurry, 2 Stardrive, both p. 794.
[11] See generally 2 Stardrive.
[12] See Event Horizon, 1 Eras, p. 760.
[13] See Exclusion Principle and One Moving Violation, 1 Stardrive, pp. 788-789.
[14] See The Blurry Lines of Progress, *et seq*., 1 Eras, pp. 759-760.
[15] See Advanced Technology, 1 Eras, pp. 761-763.
[16] See generally, 3 Eras.