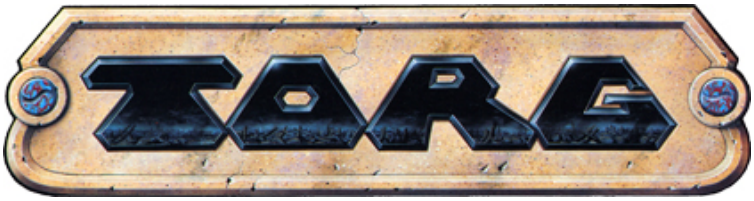
Storm Knights

Tech Axiom

Jasyn Jones



Tech Axiom

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These are original rules, intended for use with *Torg: Roleplaying the Possibility Wars*. The most recent version of these rules (and other Torg resources) can be found on the Storm Knights website:

http://darleyconsulting.com/games/stormknights/

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Introduction

When originally published, the TORG role-playing game included charts for the four axioms- Magic, Social, Spirit, and Tech. These charts covered the general path of advancement for the axioms, but were incomplete. This is a revised and completed Tech axiom.

Technological Axiom

> *"The Tech axiom affects the interactions between living beings and the natural world around them. It defines the ways in which the living can manipulate and affect the unliving natural world of their reality. It does* ***not*** *say anything about what "natural laws" operate in a cosm, such as gravity or radiation, only how much (if any) advantage living beings can take of those natural laws."*
>
> (The *Revised and Expanded TORG Rulebook*, pg. 143)

0- No technology is possible. The living may not deliberately manipulate the unliving natural world in order to achieve specific results.

1- Natural objects such as rocks and sticks may be used as very simple tools. Such tools cannot be refined or modified, but must be used "as is".

2- Fire can be domesticated but not created. It is now possible to make simple refinements to natural objects, but these refinements are limited by the innate nature of the unliving tool.

3- Fire making is invented. Natural materials like stone, wood or bone can be refined into small, primitive tools through

processes like knapping, whittling, or hardening with fire.

4- Advanced stone tool making possible. Composite tools, which combine two separate unliving components into one tool, are possible. Examples include spears with stone points and axes (which are essentially clubs with a rock affixed to the end).

Lashing and knot-tying are possible, and simple lean-tos made from lashed wood (or other natural materials) are possible. Rafts and small river craft, made from lashed logs, appear.

Animals such as dogs and goats may be bred and domesticated. Armor made from animal products possible.

5- Agriculture invented, but still practiced largely as a dietary supplement to hunting and gathering. Calendars based on easily visible phenomena may be invented.

Simple fired clay pottery can be created. Arithmetic is possible. The wheel or axled rollers first used for transportation. Fishing vessels (four or more beings, muscle powered) appear.

6- Metal is first smelted, tools may be made from first copper and then later from alloys like bronze. Metal hand axes and daggers are state of the art weapons. Bows are possible, but only with enough punch for small game.

Potter's wheel appears, plow speeds agriculture. Glass, cloth, wine, beer invented. Seaworthy ships are possible but still muscle-powered. Oil lamps invented. Kiln-fired bricks used in buildings.

7- Medicine and astronomy as organized sciences are possible (given a sufficient Social axiom for sciences.) Civil engineering possible; pulleys, block and tackle are available machines. Avian, reptilian and other "difficult" life forms may be domesticated.

Hard metals such as iron are smelted. Bows are powerful enough for use as combat weapons. Metal armor appears. Maps may be created. Simple wind-powered vessels appear.

8- Timekeeping devices such as sundials and water clocks appear. Place-based numbering systems (such as the decimal system) may be invented. Astronomy fully developed. Silk may be harvested for fabrics.

Large buildings appear for first time, may have simple plumbing to provide water and transport waste. Wide-scale irrigation systems possible.

Use of hard metals is common for professional tools, metal currency may become common (given a sufficient Social axiom for currency.) Sea vessels powered by more than one sail possible; first true transoceanic vessels possible.

9- Pharmacy and surgery organized sciences; healing herbs and simple drugs may be cataloged and produced. Lathes, paper, candles may be invented. Dying of fabric is possible.

Concrete possible. Bridges, dams, aqueducts, tunnels, road technology extensive. Hard metal tools commonplace, quality of metals improve significantly. Locks and keys become practical.

10- Specialized surgery, such as cataract surgery, possible. Basic anatomy of living beings, with all vital subsystems, understood enough to diagnose and treat many ailments.

Gears and screws possible, allowing exploitation of water power. Sugar can be refined, milling expands greatly. Magnetic compasses are possible but crude.

11- Hard metal alloys such as steel become possible. Wind power exploitable with windmills. Rudders make boats more maneuverable. Clay and ceramic techniques refined to the point that porcelain is possible.

12- Inks refined, making book printing

(block printing) possible. Acids, mechanical clocks, magnetic compasses possible. Gunpowder may be invented; cannon are possible. Small hot-air balloons may fly.

Alcohol denatured for use as a disinfectant. Primitive analgesics may be refined from plants. Biology develops categorization of animals by function rather than appearance. Glass mirrors are invented. Corrective spectacles possible, but not terribly effective.

13- Cut-glass process invented. Telescope, microscope may be invented. Steam power possible but very crude and inefficient. Metal plates used for printing; printing press possible. Barometers invented; crude weather prediction begins.

Crude firearms (matchlocks and wheellocks) possible; principles of ballistics understood and exploitable. Basic mechanics of physics understood. Probability theory and calculus invented. Magnetism and electricity connected.

14- Metallurgical advances allow precision machined parts; Industrial Revolution may begin. Efficient steam engines possible if energy source better than wood available. Pocket watches, bifocals possible. Muskets invented. Primitive rifling possible. Large hot-air balloons can be built.

Velocity of light recognized as finite. Gravitation and tides understood. Plant extracts and essences possible; inoculation invented. Anesthesia introduced into surgery.

15- First electric batteries possible. Steamboats, telegraph, crude calculating machines, somewhat portable electric generators appear. Railroads are possible. Easy to ignite matches, sewing machines, reaping machines, vulcanized rubber invented. Photography on metal plates possible.

Thermodynamic laws established. Bacteria recognized as transmitters of disease. Cell structure explained. Evolutionary theories first developed.

Flintlock firearms possible, rifling improved greatly. Artillery pieces now very reliable; as explosive shells are refined, they replace rifles as prime killer on the battlefield.

16- Single-action revolvers, repeating rifles, hand-cranked machine guns, recoil-operated machine guns are possible. Tungsten steel invented. Internal combustion engines possible.

Bicycles, telephones, hydrogen airships, gliders, submarines practical. Syringes first used for injections. Antiseptic surgery developed. Photosynthesis understood.

17- Radio voice transmission possible. Crude, flimsy airplanes can fly. Automobiles reliable enough to replace animal-drawn transport. Sonar invented. Brain surgery successful. Automatic pistols and submachine guns possible. Movies, including "talking pictures."

Radioactivity understood. Discovery of relativity possible.

18- Tanks become an effective tool of war, metal-skinned aircraft with jet propulsion, radar possible. Electron microscope, vaccinations against viral diseases, antibiotics, television, polymers and artificial fabrics, large mainframe computers, helicopters, ball-point pens appear. Nuclear power and bombs possible. Antimatter discovered.

19- Orbital spacecraft, lightweight automatic weapons, wire-guided munitions, integrated circuits, transistor radios, organ transplants, crude artificial hearts and other organs, gene synthesis, "test-tube" babies, 400,000 ton oil tanker, primitive space stations, first home computers, space shuttle, neutron bomb, robot probes to other planets.

20- Doppler radar, genetic engineering, cloning proven possible, international

computer networks, solar power, compact disks, computer-controlled aircraft, fire-control helmets, laser-guided munitions, large skirted hovercraft vehicles, permanent space station, limited fusion power, primitive "bionic" prosthetics. Mapping human genome possible.

21- Small skirted hovercraft practical, clone-organ replacement, "intelligent" self-maintaining houses, holographic television, high-energy laser weapons, fusion commercially attractive, hyperplanes capable of Mach 20, superconducting technology common, supercomputers achieve limited awareness, efficient solar cells, retina scanners, "bionic" prosthetics that function almost as well as natural limbs, practical virtual reality (VR) technology, energized melee weapons.

22- Personal energy weapons common, portable fusion generators possible, "memory" metals and plastics, artificial intelligence in computers, cybernetic prosthetics as good as or better than the natural components, advanced gene therapy, extensive genetic engineering of physical traits possible, nanotechnology practical for microscopic-scale uses, electromag weapons. Sublight interstellar travel practical though relativistic effects must still be dealt with.

23- Nanotechnology practical for macro-scale uses, "living" plastics possible, artificial intelligences can become self-aware and pass as living minds but lack true sentience. Ballistic airliners develop, complex genetic manipulations possible, genetic engineering of nonphysical traits possible, artificial wombs (growth tanks).

24- Orbital towers, anti-matter energy sources developed, regeneration of lost body parts possible. It is possible to reconstruct extinct species, given enough DNA. Full terraforming of planets develops.

Time Travel

One of the more problematic issues in *Torg* has been time travel. Because the main campaign didn't focus on it, it wasn't a standard part of the game, and was only shoehorned into the Tech axiom as an afterthought. No other axiom has an entry for time travel.

In looking at the Tech axiom, and other axioms, the question of if to allow time travel and, if so, where it fits has been difficult. In this instance, the fictional sources that are the basis of so much of Torg are not very illuminating.

H.G. Wells' Time Machine was Tech 19. Doc Brown's first time machine (the DeLorean) was Tech 23, his second (the train) Tech 19. The time machine from Dean R. Koontz's Lightning Road was Tech 21. The Terminator's was Tech 26. Bill and Ted's was a phone booth of unknown technological advancement, and Richard Collier's wasn't even a device, but a state of mind.

These are all valid examples, yet introducing time machines at Tech 19 would be disastrous. But, how else can we reflect time travel stories?

And that is the key- time travel stories. Time travel is a genre. As such, time travel is not something that should be on the axiom charts at all.

By treating time travel as a genre (or an addition to another genre), it can happen whenever the gamemaster- not the players- wishes to introduce it. He can introduce any means of time travel he wishes: miracles, psi, magic, tech, weird science, the Occult, etc.

And because he controls it, it works the way he wants, and he can duplicate any time travel story he wishes. If it's a one-shot, then it only works once. And so on.

By treating time travel as a genre (instead of a regular tool), the gamemaster retains control. Accordingly, all mentions of time travel have been removed from the axiom chart.

25- Artificial gravity can be generated, nanotech can be formed into "living" materials that reshape themselves as needed, faster-than-light space travel possible, force fields. Panimmunity medical techniques developed, medical advances increase the human lifespan to several centuries. Complex nanoviruses can transform organisms. Bio-buildings, buildings constructed as a living organism, are possible.

26- Antigravity technology available, planetary scale teleportation, dimensional travel is possible, direct conversion of matter to energy. Construction of Dyson spheres, Alderson discs, ringworlds, and artificial planets become possible. Near-total control of biological processes. Genetic manipulation in conjunction with medical technology can create virtual immortality, biotech spaceships possible.

Artificial intelligences can become sentient, possessing their own spiritual attributes. These can even become reality-rated. Through these intelligences, technology may be used to manipulate magical energies, call upon miracles, or possess psionic powers.

27- Atomic forces can be controlled to allow for dispersal and "phasing" of materials through other materials; mass and volume of objects can be similarly adjusted. Energy sources can similarly be controlled and manipulated at the atomic level. Teleportation can span galaxy-wide distances.

28- Matter and energy can be manipulated, created, and shaped almost at will. Unlimited distance teleportation is possible. Artifical stars can be created. A limited control of the flow of time becomes possible, enabling forward time travel (at which an individual moves faster through time than an observer.)

29- Whole galaxies (or galaxy-sized structures) can be fabricated. Natural laws can be manipulated over a wide scale, spanning an entire galaxy.

30- Space and time can be manipulated at will. Dimensions can be altered, created, or destroyed. Entire universes can be fabricated. The physical laws of the universe can be manipulated at will, either on a local basis or for an entire dimension. Tools cease to be physical devices, instead becoming energy constructs. Living beings may choose to translate themselves into bodies of mutable energy.

Design Notes

The Tech axiom was, in many ways, the easiest to finish. It is based (in part) on the *Revised and Expanded Torg Rulebook*. In point of fact, that Tech axiom was the reason I ended up with axioms that went from 0-30, instead of the 0-20 I had originally envisioned.

In designing this axiom, I expanded the ultra-low Tech, and collapsed the rest of the chart, removing empty benchmarks. This had a great many side benefits.

For example, Axiom 18 was empty (in both the original Torg and the R&E version) and very little occurs there, historically. It is wedged in between 17 and 19, and there are few tools that fit there. Therefore, removing it made the chart smoother.

Similar principles mandated the removal of what had been Tech 25. It is the opinion of this author that the biological and technological achievements of classic Torg's Tech 26 are closer than such a benchmark would indicate.

Later, I went back and revised the upper reaches (20 +) based on my own ideas and some science fiction concepts I wanted to add. As well, a vigorous debate on the Torg boards helped me flesh out the lower reaches (and gave them historical context and support).

Future Tech

The Tech axiom is centered primarily on tools which work based on the laws of the natural world. Such laws include Newton's Laws of Motion, thermodynam-

ics, biology and heredity, physics, chemistry, quantum mechanics, and so forth.

As the Axiom rises, we move from tools based on natural laws to tools which themselves change natural laws. At its height, in Tech 30, all tools operate by altering how the natural world acts. For example, by increasing the coefficient of friction to a near-infinite value, two dissimilar pieces of matter can be permanently and irrevocably bonded (at least, until another tool turns the effect off.)

It has been asserted by some TORG fans that "Axiom 33" allows anything and so is indistinguishable from axiom to axiom. This author cannot disagree more. One of the primary goals of this redesign has been to give flavored "super-axiom" benchmarks, so that Tech and Magic can both achieve incredible effects, but are still different in tone and feel. I leave it up to the reader to judge how well I accomplished this goal.

Conversion

Because the axiom chart has been altered, conversion notes are necessary. The following charts allows gamemasters to convert Tech axiom ratings from the old axiom to the new axiom. It lists two values, a literal conversion, which maintains the old Tech rating as much as possible, and a "suggested" rating, which modifies the Tech axiom of the cosm to take certain realities into account.

Also remember that, even if the relative Tech advancement is unchanged, lower numbers are to be expected in most cases. These cosms have the exact same Tech development, but the scale has changed. A 23 on the old chart is only a 20 on the new chart.

Cosm	Original	Literal	Suggested
Aysle	15	13	13
Core Earth	23	20	20
Cyberpapacy	26	22	22
Land Below	10	9	9
Living Land	7	6	41
Nile Empire	21	18	18
Nippon Tech	24	21	21
Orrorsh	19	16	16
Space Gods	30	26	262
Tharkold	26	22	22
Tz'Ravok	12	11	11

[1] A Tech of 6 is far too high for the Living Land. A 6 is glass, cloth, wine, metal smelting, oil lamps, and the like. None of this is appropriate for the "Living" Land. A 5 would be clay pottery, calenders, the wheel, fishing vessels, and such. In this author's opinion, the Tech rating of 4 is far more appropriate to the Eidenos.

Even though this lowers the axiom, it actually strengthens the realm. No longer can Storm Knights depend on their metal weapons and backpacks. This makes the Living Land even more deadly.

[2] The Space Gods Tech rating is a close, though not definitive value. The higher Tech levels have been shuffled. Technically, a 26 represents a far greater level of achievement than the old rating. However, it is the first time biotech space ships are available, a staple of the Space Gods reality.

Complete Conversion Chart

Because Tech is so central to most cosms, I have provided a full conversion chart. This chart is close, but not perfect. Owing to the rearranging of high Tech concepts (22+), the two charts will never perfectly match.

Original Axiom	Revised Axiom
0	0
New Entry	1
1	2
2	3
3	4
4	Removed, empty benchmark.
5	5
6	Removed, empty benchmark.
7	6
8	7
9	8
10	9
11	10
12	11
13	12
14	Removed, empty benchmark.
15	13
16	14
17	15
18	Removed, empty benchmark.
19	16
20	17
21	18
22	19
23	20
24	21
25	Removed, empty benchmark.
26	22
27	23
28	24
29	25
30	26
31	27
32	28
33	29
Entry higher than old Tech 33.	30

Storm Knights

Jasyn Jones' Storm Knights

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These rules are based (in part) on material published in the following Torg rulebook(s):

Torg Boxed Set
Original Mythos and Game Design: Greg Gorden
Mythos/System Development: Douglas Kaufman, Bill Slavicek
Additional Mythos/System Work: Christopher Kubasik, Ray Winninger, Paul Murphy

The Revised and Expanded Torg Rulebook, v. 1.5
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