TechSense

A Hard Sci-Fi RPG with Variable Crunch

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Contents

1   Introduction

Welcome to TechSense! TS (for short) aims to provide a crunch-lite space adventure with a hard sci-fi background. Inspired by the works of authors like Robert Heinlein and Ursula K. Le Guin, TS aims to give truly alien experiences without delving into space-fantasy or space-opera. We designed this system to keep things at least a little realistic, without bogging players down with excessive math or killyjoy-type limits on what you can do.

Almost completely devoid of combat, TS instead focuses on role-playing and acquiring the skills necessary to traverse the universe. Skills are easy to acquire and level up, but take a lot of work to perfect.

We hope you enjoy playing, but remember: if you don't like something, change it, and ignore any rules that ruin your fun. If "fun" to you is always following all the charts and calculating orbital transfers and insertations, then stick to that. If it means skipping by all that and just spending some fuel, then that's fine too. This is only a guide, after all. The most important part is the people at the table.

-Alexander Lowry

2   Basics of Playing

If you already know how to play tabletop RPGs, you can probably skip this section. If you don't, welcome! We hope this will be far from the last one you'll play.

The game is a collaborative story told by the players with the help of the Game Master (GM). The players navigate characters through the universe that the GM creates. The players don't play against each other, and definitely don't play against the GM, nor does the GM try to at as an enemy of the players. They all negotiate the story together.

3   Sense and Tech

There is only one stat in TS, and it's not *terribly* important. It's the Sense and Tech axis. It's pretty simple: the closer you are to sense, the better you are at interpersonal relationships, diplomacy, talking, etc., and the closer you are to tech, the better you are at using technology, navigating, piloting, and so on. But both are on the same axis, and your character keeps track of just *one* number. We'll call this your *gestalt number.*

Actions work like this: roll a twelve-sided die (a.k.a a *d12*). If you're rolling for a tech action, then you succeed if you roll your gestalt number or higher. But if you're rolling for a sense action, you succeed if you roll your gestalt number or *lower.* So the better you can roll on tech, the worse your ability to succeed on sense rolls, and vice-versa.

You're not locked in to a single gestalt number, though. Every time you take an action that requires a tech roll, your gestalt number goes up by one (up to a maximum of 11), making a future tech success less likely (as you get too much in your own head), and you gain one point. Every time you take an action that requires a sense roll, your gestalt number goes *down* by one (down to a minimum of 2), making a sense success less likely (as you socially exhaust yourself), and you gain one point. So you may bounce back and forth along the Sense and Tech scale, depending on what actions you take. Up to 11 then down

to 2 again. You'll get better and worse and different rolls over time. If you want to focus on one, you'll have to take both types of actions equally to keep your advantage at one end.

But here's what's important: you don't lose the modifiers that you acquire from spending your points whether that be +1 or +2 or -1 (remember, this isn't a bad thing for tech rolls) you might get on rolls while using *that* skill. So even though you, normally playing with tech, may move toward the sense side over time, making rolls harder, your specialized tech skills will still push your tech rolls toward success.

Note: Abilities are not affected by the player charcter's current gestalt number at all. You don't roll on abilities.

3.1 Failure

If you roll, and fail, then something goes wrong. It's up to the GM to determine what goes wrong. The GM should use their best judgement to determine the severity of what happens. If, for example, a shuttlecraft's instruments are out, a player may try to land by the seat of their pants, and choose to roll with a pilot skill aiding that roll. If their gestalt number is 4, and their pilot skill is 2, but they roll a 1, they get a total of 3 and they fail. However, it might be cruel to TPK (*total-party kill; killing every player's character*) and end the game right then.

Instead, the GM may choose some consequences. Perhaps the shuttle lands far off-course, and has its landing gear damaged on touchdown, preventing the players from taking off until they repair it. Perhaps they crash-land in someone's barn, making the locals upset. Depending on the severity of the failure, and how much pity the GM wants to take on their hapless players, the consequences could be lesser or greater.

Be sure not to let a failure halt all action; that kills the pacing of the story and morale of your players. Players *do* enjoy a challenge when they're forced to fight harder, but making success impossible will discouage them and make them disengage with the game.

4 Character Creation

4.1 Fiction First, then Mechanics

It can be tempting to create a spreadsheet of skills and slap on a face later. This can help with the numbers of your character, but you will have a hard time interacting with other players or non-player characters if you don't know *who* your character is.

It's better to come up with an interesting character, full of story and life, then choose the skills and abilitiesthat fit that character. Since you will be changing your skills and abilitiesfrequently, you shouldn't define your character by those things alone.

uhh....

An Example Backstory   *Maverick is a human from Terra. He grew up in the state of Iowa in the American Union. He is on the ship to be an envoy, with a specialization in cultural traditions. He hopes to find his uncle who went off with an interstellar mining guild fifteen years ago.*

This example includes a number of good elements. It includes a species and heritage, providing a cultural background. It also has a job you can build skills around. Finally, it has some abstract personal goal unrelated to the character's job.

4.2   Switching Characters

You may also switch characters frequently, so you don't have to be locked in to one forever. At the end of a session, you can switch to any character on your crew, or who is a (semi-)permanent resident of your ship. Be sure to work with other players so that your new character doesn't fulfill a need that another character already fills.

Before you come to the next session to dive into this new character, make it your own. You may know a few things about this character, or even quite a bit, depending on how much you interacted with them when they were an NPC. Try to keep them true to what you've learned so far, but also add backstory, beliefs, experiences, history, and motivation to them, so that you can play them fully. The GM may also choose to give you certain notes about this person to help you.

Note to GM: don't make a crew member NPC a critical piece to a plot, just in case a player switches to that NPC. If you must have a traitor or mole, make them either a temporary traveller joining the ship for a short time, or some other member of the faction that this ship is part of, to be transported or taken care of for a short time. This way, the critical NPC can play their role, but not get in the way of players.

4.3   The Crunch

Once you have a character in mind, it's time to get into the numbers, babey!

1. Choose a gestalt number.
   The higher the number, the more likely a sense roll will suceed, and the lower the number, the more likely a tech roll will suceed.

2. Choose a skill to max out.
   Presumably, your character is an expert at something! That's why they were chosen to be on this ship. Pick any skill, and give yourself the maximum level.

3. Choose two more skills at level one.
   You have other skills and training. Choose two things to have a basic proficiency at.

Our Example from Earlier   *Let's continue creating Maverick. Maverick now needs a gestalt number, skills, and abilities. Since he's an envoy, he should probably start with a high gestalt number, so he can roll better on sense rolls. Let's go with 9. We should also mostly give him sense-based skills. Let's give him Envoy as his maxxed-out skill. Let's also give him Anthropologist at level 1, since that fits his mission well. It might be wise to also give him a tech skill, too. Let's pick User Interfacer (his second level-1) because it helps round him out, but also fits with his character as someone who figures out strange and alien civilizations.*

That's pretty much it for basic character creation. Add more backstory to taste.

5 Skills

Skills are specific areas of expertise that help you complete actions by giving a helpful bias to certain rolls. When you roll for an action, you can apply **one** of your skills to that roll, as long as the GM agrees that your skill is relevant to the action you're trying to do.

Whenever you roll, you get one point. You can acquire a skill by spending one point. You can also 'level up' skills. Leveling up skills means it biases your roll more strongly. A skill can be upgraded twice, meaning that it can be as high as level 3. Each skill upgrade costs its level in point. You can do this at any time, during the game, before or after the session, or sitting at home in between sessions. The types of situations in which a skill can be used are written underneath the skill's name. Also, the amount of the modifier is listed.

Check the skill's description since level 3 doesn't necessarily mean that it gives a +3 or -3 bias.

Remember, the bias given by the skill's modifier does not change based on your gestalt number. If you are heavily towards a sense direction, a tech skill modifier is just as strong. Your overall odds of success on a tech roll is still low, but for certain skills it will still be higher than it would be without the skill.

Some skills have prerequisite abilities.

5.1 Abilities

Abilities are like skills, in that they cost points but instead of aiding a roll, they allow you to do something you could not before. Abilities cost 5 point per level, across the board. Skills are about increasing the chances of success for things you already know how to do, but abilities are about doing new types of things. They may unlock new skills for you to acquire and upgrade.

6 Session Zero

So you're ready to play. Your characters need to get to know each other (and maybe your players, too). The GM should block out an hour or so for everyone to get on the same page. Start by introducing the world, the ship, and what kinds of missions or goals your organization has. What are the "given circumstances"? What is the recent history of this this world? What's the organization you're part of like? Try to give a sense of the vastness of this universe, and the strangeness of its inhabitants.

Next, the characters should introduce themselves to each other. After giving a real-life name, switch into the character, talking as if you *are* that charcter. While not essential, a character voice helps differentiate your character's opinion and questions from your own. Before talking about what your character does, talk about who they are. Where are they from? What do they look like? What's their cultural background? What skills do they bring to this starship? Why did they want to become an astronaut? Highlight things that are important to the character.

An Example Introduction I'm Jane. My character's name is Natalie Cook. [Here, you can switch into your character.] *I'm a nuclear engineer from the South Pacific League. My parents worked on Earth's space elevator. I'm a woman who looks South Pacific and have short black hair that I keep in a bun. I usually wear the standard jumpsuits, even on shore leave. Since I grew up around the kids of other engineers, I know a English-Polynesian-German creole unique to the area around the project. I work on the ship's propulsion systems, and became an engineer specifically to join a starship crew. I became an astronaut because I want to discover how other planets and cultures solve engineering problems. I play board games in my free time and brought chess in my personal items. Hit me up for a match!*

The astronauts (the whole crew of the ship) would have gone through several months of training with each other. They know each other well, trust each other, and are open with feelings and concerns. Maybe they don't know each other's personal lives in detail, but there should be no loners. After all, a starship is only so big. A broody or antisocial person would have been weeded out pretty early on. Have everyone discuss what friendships or friendly rivalries were developed during training and mission simulations. Then, have characters introduce and describe these relationships with each other.

An Example Relationship *Debola and I are the two main pilots on this ship. During training, we spent a lot of time competing for high evaluations on simulations. Sometimes we would play the same senarios dozens of times to shave the smallest amounts of fuel off of docking or landing costs. We relentlessy mock each other's skills, but go out for a drink together once we're done for the day. Debola's probably my closest friend on the ship.*

Finally, the GM should introduce the players to the first mission. They'll be able to choose which missions to take on later, but a short, simple one to begin will help give a sense of how the game goes. Play through this in about an hour, ending on a cliff-hanger, like a distress call, a strange ship exiting lightspeed nearby, or a failure being discovered on the ship. A sense should be given that something is about to happen at the beginning of the next session.

7 List of Skills

7.1 Sense

Aldrin +2/level on piloting, orbital rendezvous, and docking *without instruments.*

Anthropologist +1/level understanding and learning a new culture.

Chameleon +1/level disguising as another species or culture.

Cook +2/level on making food.

Critter Wrangler +1/level on creature-related shenanigans.

Diplomat +1/level for persuading politicians, businesspeople, or leaders.

Envoy +2/level on first contact messages and interactions.

Haggler +1/level while negotiating a deal with a salesperson or trader.

Linguist +1/level learning any new language.

Mathemagician +1/level doing anything cool with math.

Trekker +1/level on figuring out where you're going on unfamiliar ground, with or without maps.

7.2   Tech

Botanist -1/level on identifying and finding plants.

Cartographer -1/level on making and reading maps.

Engineer -1/level on operating and repairing machines.

Firefighter -1/level on suppressing or preventing fires.

Historian -1/level on inferring or learning about local history.

Mechanic -2/level fixing devices you're familiar with.

Navigator -1/level on figuring out where you're going dirtside.

Pilot -2/level on operating a flying vehicle. Tricks encouraged.

Radio Operator -2/level on operating radios.

Radio Scanner -1/level on identifying objects on radar and long-distance imaging.

Schematisizer -1/level on reading unfamiliar schematics.

Surgeon -1/level for first aid, or large healing during resting times.

User Interfacer   -1/level on figuring out an unfamiliar or alien control scheme or device, or discerning something's function.

8   List of Abilities

Astrogator   Ability to navigate interstellar travel.

Dialectist   Ability to learn a dialect of a language already known, in 7 days. At level 2, this is reduced to 3 days. At level 3, the player charcter can figure out the jist of the dialect in about 1 conversation's time.

Experimenter   Ability to operate medically on alien physiology.

Star-Pilot   The player charcter can pilot an interstellar vehicle.

9   Ships

If you want to travel the stars, it's likely you're going to want a ship to get around in. Most ships in TechSense are *torch ships*. A torch ship is a ship that, within the universe, still obeys normal physics like orbital mechanics (that is, doesn't fly around like an airplane), but its engines are absurdly powerful.

Despite many attempts to be as realistic as reasonable, faster-than-light travel (*FTL*) is also possible in TechSense. We made this concession only to allow for wider exploration. Near-light travel would allow travel to other solar systems within a lifetime, but only to those within the ship. To the outside universe, decades would go by. So we have faster-than-light drives.

Ships have many differences between them, so here is an overview of what ships can have.

9.1   Maneuvering

Burns

A *burn* is any time an engine turns on, and causes the velocity of the ship to change. All maneuvers are made through burns. Burns cost fuel, of course.

Ballistics

Ballistics are traditional rocket maneuvering using optimized burns. These burns can be quite complex[1] thanks to the unintuitive nature of orbits. You can't just point the direction you want and *go*. You've got to calculate how your velocity will change over time as planets and moons pull on your ship.

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[1]Not rocket science complex, but *almost*.

Fortunately, we've included several charts for simple calculations, and program tools to do some more complex stuff... to a point. If you already know about orbital mechanics and just *love* calculating plane changes and phase matching then go ahead.

If you don't love all that stuff just use the charts or do torch burns for everything. What's a torch burn? Glad you asked...

Torch Burns

You know what we just said about not being able to point where you want and just *going?* Actually, you can, it's just absurdly expensive. But as we mentioned, our ships can be absurdly powerful. A Torch burn is also called a *burn-flip-burn*. You point to your target, burn toward it until you reach the halfway point, flip 180°, then burn until you come to a stop.

The key is that since there's no brakes or friction in space, you have to spend just as much time slowing down as you did speeding up. Hence, the flip at the halfway point. It's also possible to have a coast period in the middle, though obviously you wouldn't speed up as much, and would consume less fuel.

The equation for a torch burn is:

TODO: Add the torch burn equation.

FTL Jumps

Write this later... once we figure out how they work.

9.2   Equation Cheat Sheet

9.3   Energy Source

Typically, an energy source for a ship will be nuclear. There are exceptions, though.

Fission

Fusion

Exotic

9.4   Engines

NERVA

Nuclear Pulse

Magneto Inertial Fusion

Nuclear Saltwater

Ion

Aerospike

Sabre

Anti-Matter

Exotic Matter

9.5   FTL Engine

9.6   Structure

Robust

Medium

Lightweight

Foil

Plate

Reinforced

9.7   Armaments

Lasers

These are basically useless for combat. They can ablate a little material, but not fast enough to save you when you're in a bind. But sure, you can have lasers.

Railguns

This, now *this* is what you want to use. Nothing can ruin someone's day faster than hundreds of metal slugs slamming into their ship at thousands of meters per second.

Be cautious, since some planets may not take kindly to you generating debris in important orbital lanes.

Missiles

Magnetic Pulse

Anti-Missile Missiles

9.8 Sensors

Radio

Pictures, spectro-analysis, radio telescopes.

Astrogation

Telescopes

Docking Radar

Gravitometer

9.9 Ansible

An ansible is similar to a radio, but its signal propagates faster than the speed of light[2]. This makes it possible to communicate with other ships and bases several lightyears away without having to wait several years for that light to travel. In TechSense, there are two types of ansibles.

Type A

The Type-A ansible can communicate with a constant round-trip time of seven minutes to any other Type-A ansible you know of, within twenty lightyears. The signal can be repeated from base to base, of course, so any non-isolated base of your faction within twenty lightyears of you can probably carry the message further, with additional delays.

Type B

A Type-B ansible can communicate instantly (or with arbitrarily low latency) to a *paired* Type-B from any distance. Unfortunately, the link between two Type-Bs only lasts seven days *relative to each ansible's time.*

For example, if ansible 1 is at 'normal' time, but ansible 2 is experiencing time at an accelerated rate, then the ansibles fall out of sync when ansible 2 experiences the passage of about seven days. The link is destroyed when one ansible experiences seven days first.

It takes fifteen minutes to sync two Type-Bs together, and they must be physically next to each other, in the same frame of reference[3].

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[2]In real life, this would either mean that relativity would be violated, since information would be travelling faster than light, or that causality would be violated, since it would be possible to recieve news before it even *happened*, under certain conditions. But with FTL travel, we've already broken one of those two.

[3]This means they should be under the same gravity and both moving the same speed. This will not be a problem if both ansibles are on the same ship, or on two ships that are docked together.

Typically, shuttles of a ship will have Type-Bs on them, each with a matching Type-B on the main ship. Even being on two different planets in the same system, radio signals can take hours.

10 The *Stone's Throw*

Stone's Throw is the basic ship for TS. Other ships are outlined in the Book of Ships, but this is the basic player's ship.

10.1 Description

Stone's Throw is a Torch Ship. A "Torch" ship is any ship with an engine that is unreasonably powerful - that is, it can get around the solar system in a matter of weeks, at unreasonably low fuel cost.

The *Stone's Throw* is a truncated sphere, with its engines and landing gear on the flat underside. The sphere is 50 meters in diameter, and there's about 58,500 cubic meters of space encompassed by the sphere. About 12,000 cubic meters are taken up by the reactor and engine assembly, plus an additional 5,000 cubic meters for other structural elements, leaving about 41,000 cubic meters of space for everything else. This feels cramped for the 300-person crew compliment. The maximum capacity of the ship is 400 people.

10.2 Daily Life

Each person gets about 8 cubic meters of space to call their own. This seems uncomfortably tight for a bed and personal cabinets, but in null g every surface becomes a wall, a floor, *and* a ceiling.

10.3 Energy Source

10.4 Engines

10.5 FTL Engine

10.6 Structure and Hull

10.7 Armaments

10.8 Sensors

10.9 Ansible

10.10 Shuttles

Oxygen

Oxygen is generated via a hydroponic algae that feeds off the heat of the Torch reactor.

10.11   Other Ships

Here is a table of other ships based off the Stone's Throw. Fill in details, but here are their basic stats:

Size	Name	Other
big	Goofer	An example
small	Beeboo	Another one

11   Other Information

11.1   The Game

11.2   Inspiration and Further Reading / Playing

This game was inspired by several other games, as well as books.

Lasers and Feelings   by John Harper (Twitter: @john_ harper). This is a very lightweight RPG system that fits on a single page; its lasers and feelings axis inspired the creation of this game, after we played nearly an entire Apocalypse World campaign without rolling on about half our stats more than a couple times. When first under development, this game's name was even "Lasers and Feelings with Advancement".

The Left Hand of Darkness   by Ursula K. Le Guin. An envoy for humanity is sent to a planet known as Winter to establish first contact. He finds a strange species of human that is biologically androgynous, and free of gender, causing him to re-examine assumptions he has made about his culture and himself. This story inspired the strange types of humanoid aliens found in this game.

The Rolling Stones   by Robert Heinlein. A set of genius twins decide to use the money they made from an invention to buy a ship and wander the solar system. Unfortunately for them, their family wants to tag along. Likely influenced the Star Trek episode *The Trouble with Tribbles*.

Space Cadet   by Robert Heinlein. A boaring-school story set in space. A handful of space cadets find themselves on their own when asked to investigate some strange occurances on Venus. Features a flight computer controlled by gears, where a cam must be cut for each planet according to its gravity and atmosphere, to correctly control automatic landing.

Citizen of the Galaxy   by Robert Heinlein. A young slave boy is taken in by space traders after his adoptive father is executed for being a spy. He travels between many strange and incomprehensible cultures before arriving on the one which to him is strangest of all - Earth.

The Moon is a Harsh Mistress   by Robert Heinlein. The moon, a former prison colony for Earth, grows restless at the poor treatment of 'loonies' by Earth. They start a rebellion, opting to lob rocks at Earth via an enormous railgun, which impact the surface like atom bombs thanks to the gravity well. Shows an enormous complex of computers becoming sentient emergently, who is probably the most interesting character in the book. Also features the sex-fantasties-disguised-as-culture endemic to Heinlein's adult novels, and even tries to defend them, though not graphically. At least it's not straight masturbatory material like *Stranger in a Strange Land.*

Star Trek: The Original Series   One of the early science fiction television serials, Star Trek has both fun concepts and a healthy helping of ham. About half the episodes are watchable to a modern viewer without a literary background. The episodic format of unusual creature encounters, as well as the existence of space colonies from before the invention of lightspeed that were forgotten may have come to TechSense from this series.

The Forbidden Planet   An early sci-fi movie which Gene Roddenberry credited for inspiring Star Trek. Features a totally invisible monster whose motivations are a classic sci-fi twist. Also has a classic "father and daughter alone on a desert planet with secrets to hide and maybe they'll murder people to keep it that way" which is another fun one.

11.3   The Book

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        This book was written by Alexander Lowry and Samuel Olson. It is typesetted in LaTeX.

11.4   Modifying the Book

Because TechSense is licensed under the GNU General Public License, you are free to modify, redistribute, and even sell (as silly as that would be) TechSense, with or without modifications, without asking for permission from the authors or paying any kind of licensing fee.
        The authors ask that you would attribute credit to them, just as they have attributed credit to the works and systems that inspired the creation of this game.
        The source LaTeX files can be found at zanderlowry.com/TS and downloaded gratis, just like the rest of the game.

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