PROJECT SHATTERSTAR

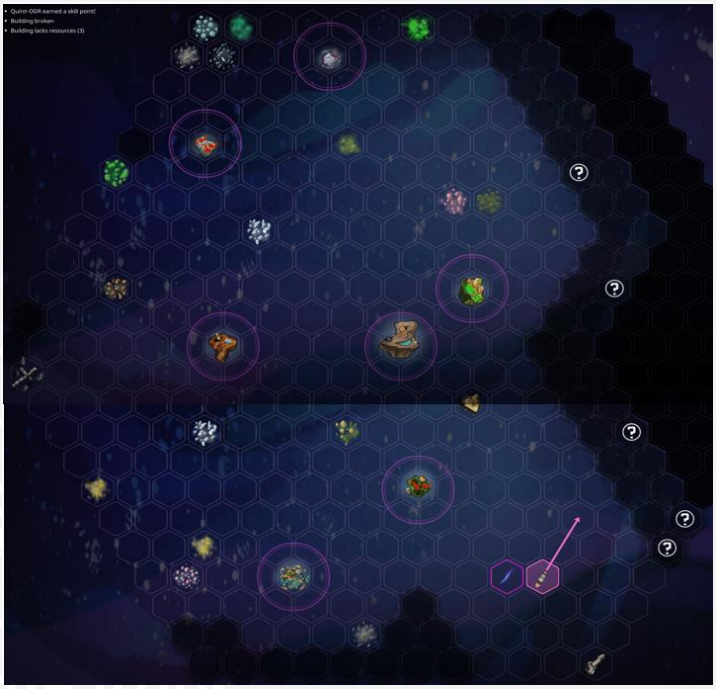
VOLUME 1 OF GUIDE TO THE **ONI**-VERSE

OXYGEN NOT INCLUDED

SPACED OUT!

By- the stormfather

CHAPTER 9 : Whole New Worlds



Space Exploration at Cycle 400

Space exploration is serious business. In spaced out, feeding and supplying the duplicant with oxygen is a challenge. But we have a few tricks up our sleeve…..

Highlights :

- We set up as close to a perpetual rocket as Spaced Out will allow
- We discover 4 planets and other space objects
- We overhaul our various bases with improvements
- We upgrade our ranches with more automation.

https://linktr.ee/Stormfather

PROJECT SHATTERSTAR

CH 9: Whole New Worlds

Disclaimer-

Oxygen Not Included is a sandbox game limited only by the player's imagination. I can assure you that no player (including me) has figured out the 'right' way to play the game…. No matter how many hours they may have put into the game.

That's because there is no right way. What you do depends on what you want to achieve. Some love building ridiculous and elaborate builds, while others are more efficient and practical. Both are perfectly acceptable ways to play. What matters is that you enjoy what you do.

The following document is a guide and not a gospel. Like every other player, I have my unique style of play. What I intend to do is to share my playstyle and start a conversation with the community. This document will take you through a real and typical game, showcasing my approach to things. The playthrough will not be perfect. But it will be enlightening and entertaining. I hope my readers will use this series to modify their own unique style rather than copy mine.

Feel free to skip, ignore or modify any of the recommendations given in the series.

All Game art has been taken from the game files and is the property of Klei (if that wasn't obvious enough). I've used them only to make the document more engaging.

While this guide is quite simple, It's not meant to spoon-feed you. You may have to do a bit of additional research if you are a new player, and I'm happy to answer any specific questions.

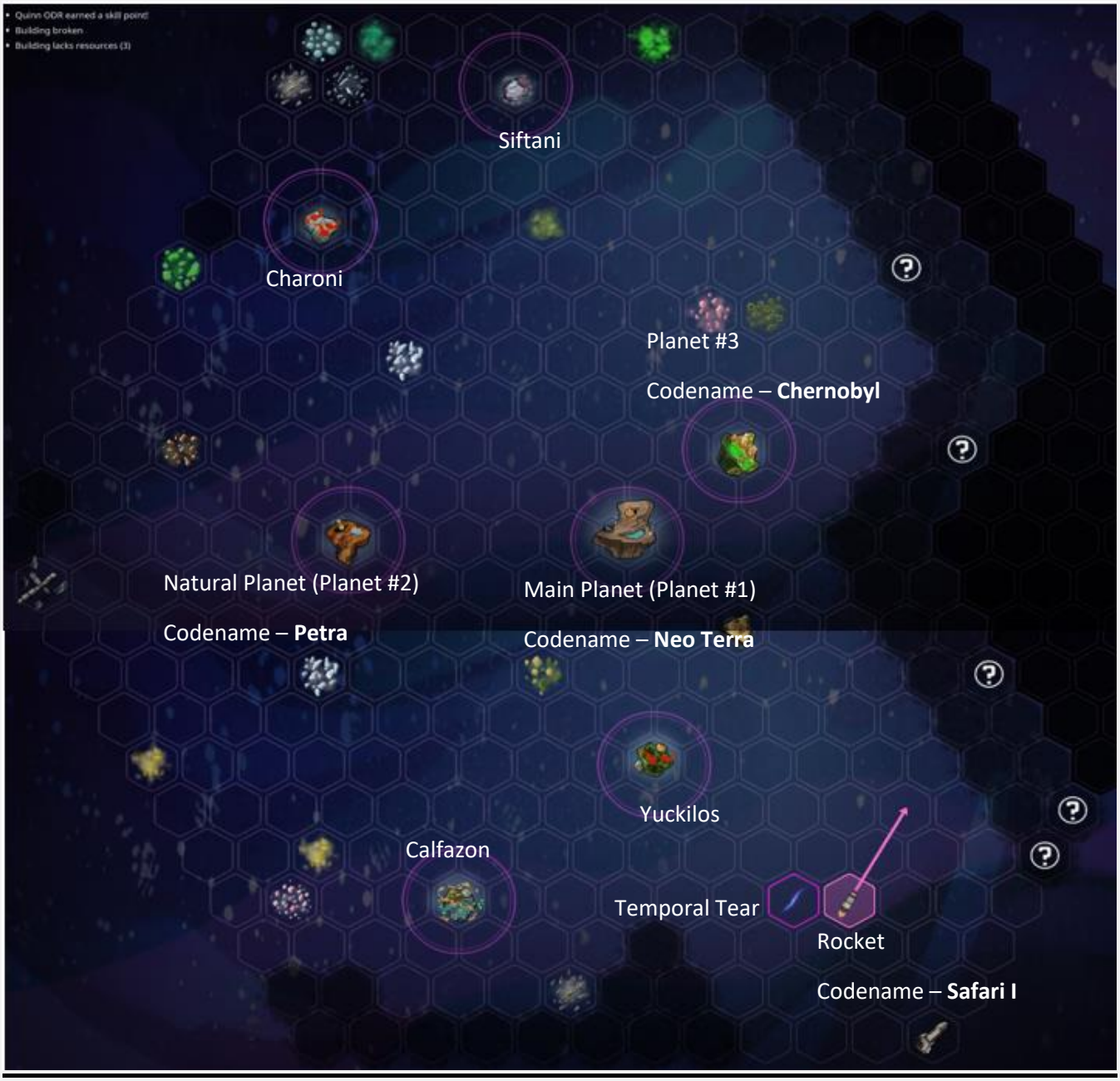
The easiest way to find me is on Reddit. My handle u/Storm-Father. Please feel free to drop me a message or tag me in a post.

The series will use the following mods. These are quality-of-life mods and do not affect core gameplay

- Wounded go to Med bed
- Per-planetoid materials
- Blueprints fixed
- Pliers fixed
- Bigger Building Menu
- No ‘Long Commutes’
- Suppress Notifications
- Geyser Calculated Average Output tooltip
- Critter Inventory
- Queue for Sinks
- FreeCamera
- MaterialColor
- Show industrial Machinery Tag

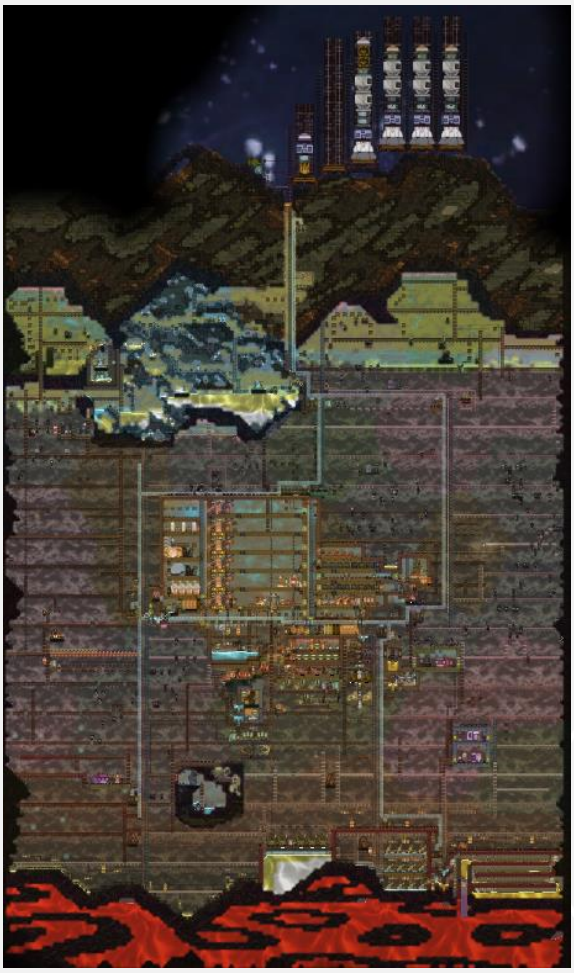
Game Coordinates – ‘SNDST-C-360860549-0’

The Starmap

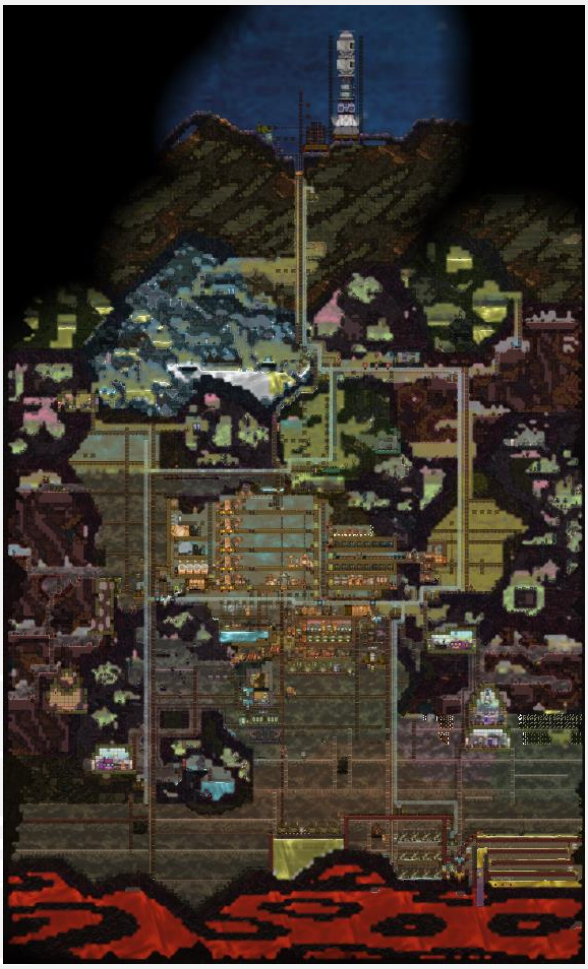


The layout of the introduction has been changed to accommodate the increase in information that comes from having multiple planets. If you have any suggestions on alternate layouts or additional information, feel free to let me know on Reddit.

Neo Terra

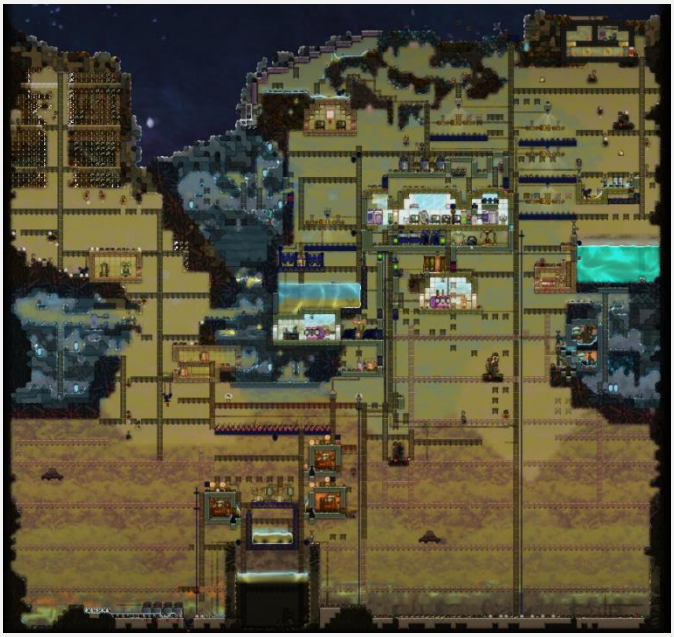


Cycle 400



Cycle 305

Petra

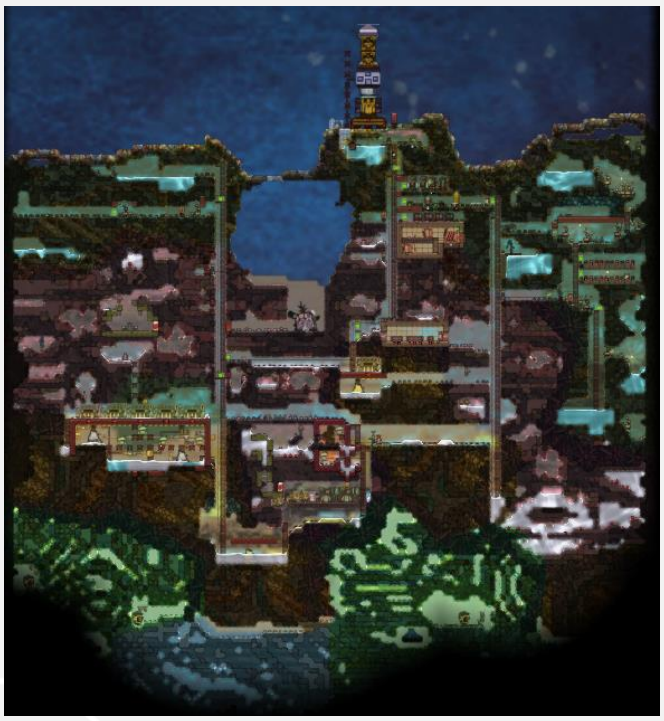


Cycle 400

Cycle 305

Chernobyl

Cycle 400



Cycle 305

1) The Perpetual Rocket

No setup can go on forever, least of all a rocket. It needs to refuel every now and then, at the very least. On top of that, we also have to take care of our pilots. In the base game, any duplicants in rockets don't need any food or oxygen to keep themselves alive. In spaced out though, duplicants LIVE inside the rocket, meaning they have to be kept fully supplied or they would die inside the rocket. This is the biggest challenge in Spaced Out.

Rocketry isn't well… rocket science if you follow the basic rules of ONI – match what you have with what you want. The objective is to explore space, ideally in the next 100 or so cycles. By then I hope to have enough duplicant time and resources to build rockets that specialize in colonization.

What do we have? Well. We invested pretty heavily in petroleum and already have a pipe of petroleum that goes all the way up to space. Additionally, we have been building up a sufficient amount of oxylite, which will not only serve as fuel for the rocket but also be used to supply the duplicant with oxygen.

So in theory, our rocket lands, the tanks can be refilled and the oxidizer is resupplied in under a cycle, allowing for an immediate relaunch.

The problem is the duplicant.

Oxygen can be supplied by oxylite, but the duplicant also needs a plumbed toilet. And most importantly, they need food. Lots of it. A duplicant consumes 1000 calories a day, meaning we need 100,000 calories for the overall mission at the very least. Food spoilage is my biggest concern here because a lack of food is basically a death sentence for the duplicant. If the rocket runs out of food in the middle of a voyage, there is a very good chance they will die before they can get back.

For food, we are left with ~~two~~ **three** options –

- **Carry only unspooling food with you**.

  This would include muckroot, nutrient bar, berry sludge and so on. If the food is incapable of spoiling, there is no worry of ever losing it to spoilage.

  But such food is usually available in limited supply. Theoretically, you could make a bunch of berry sludge (made from bristle berry and sleet wheat) but in my experience, that would be a waste. Berry sludge is a very finite food source in the mid-game and I would recommend you save it for the actual colonization where it may be more critical.

- **Spice your food.**

  This is a new option that comes with the latest update to ONI (Spoiler alert: It's not the option I used). Spicing food with certain ingredients gives it certain properties. In our case, salt and mealwood seeds can enhance the freshness of the food to such an extent that it can remain perfectly unspoilt if kept in a neutral atmosphere in a refrigerator. No inert gas or freezing temperatures are required.

  This is an excellent option for space travel, where you can spare the electricity to run a fridge (with the proper rocket design that is). The only possible risk is that if for whatever reason your electricity fails or you expose the food to pollutants like polluted oxygen, you could lose all your food. But all in all, this is an excellent option for rocket food and I would encourage you to explore it.

Grow food in the rocket

As hilarious as that sounds, growing food in the rocket is a perfectly viable option, one that I have tried and tested extensively. With the latest update, I'll admit (very grudgingly) that spicing food is the easier option. Even so, I find growing food in the rocket to be fun and more stable for multiple missions.

Let's do a quick calculation of how much food we'd actually have to grow. A duplicant needs 1000 calories a day, meaning the amount of food we grow should ideally produce more than this. For example, a domesticated mealwood takes 3 cycles to grow, meaning that it produces 200 calories a cycle. This would mean I'd need at least 5 mealwood plants to support my duplicant.

Grubfruit plants can give grubfruits when a sweetle or grubgrub rips its top off. Grubfruits give 2000 Calories every 8 cycles (Or 250 calories a cycle) meaning that 4 plants can support a duplicant. This is my plant of choice, for several reasons –

- Reasonable yield
- No need for any piped inputs
- Reasonable temperature tolerance
- High availability of sulphur

But when it comes to calculations, it's always better to bake in a factor of safety. Thus I'd have to put in 5 plants. Or…. I could keep a wild pet.

We need a sweetle / grubgrub to rip the tops of our plants anyway. So what I do is I just continue to keep them in the rocket as a permanent guest. Grubgrubs perform grubgrub rubs and sweetles perform sweetle tendings that increase the growth rate of plants. In theory, a grubfruit can grow in as little as 4 cycles if these critters are tending to it, though in practice it's not quite so quick. Even so, this boost is more than enough to produce food in surplus.

With this setup, we grow more food than we need, which allows us to have a reasonable buffer. And while this ultimately means that some food will rot and get wasted, It's not that big a deal in the greater scheme of things. We have plenty of sulphur to feed the plants and there are usually plenty of wild grubgrubs on the map.

Just remember to keep a wild critter. A tame one is not going to be happy with no grooming.

2) Rocket Science -

With the nuances of keeping your duplicant alive out of the way, let's talk about the actual rocket design.

I like to run my rockets on petroleum. The Petroleum engine is an excellent engine with good range and module capacity, meaning we can create large and fast rockets that can go a long way and back. Only the hydrogen rockets are better, and they'll be much harder to unlock. Radbolt rockets are descent too, but we have more important uses for radbolts. And in any case, we haven't harnessed nuclear energy yet,

I like using 2 liquid tanks to store petrol and 2 small oxidizers to store the oxylite that acts as the oxidizer. Since we have no plans of landing anywhere, there are no trailblazer modules. In spaced out, rockets produce energy when in flight. So by adding a battery module to our rocket, we can store the energy produced and use it if and when we need to stop at a particular spot in space. Plus, we don't need a solar panel module.

There is a cartographic module that explores space as well, but it's not great and I find adding a telescope to the rocket to be a better

option. I'll get into more details on this later. You can also add an artefact transport module if you're planning to go looking for artefacts as well.

As a general rule, don't add more rocket modules than necessary unless you're okay with slowing down a bit. It won't affect your range though. ONI rocket mechanics are nowhere near real-world mechanics and use fuel as a function of distance. 1800 Kg of petroleum gives us a range of 20 tiles, though you should use this number with a grain of salt.

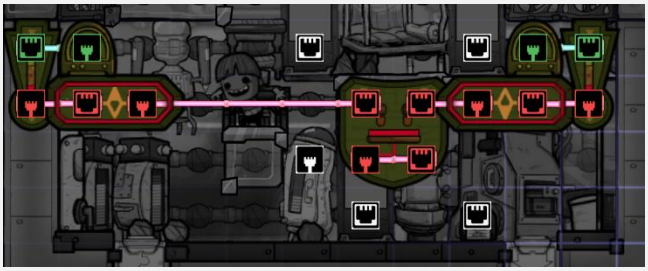
Imagine getting stuck in the middle of nowhere

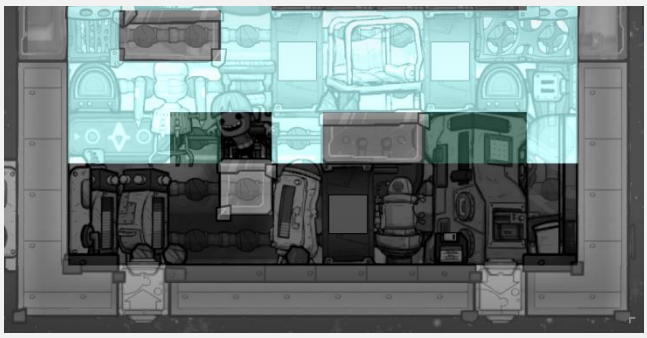
In my experience, the game weirdly calculates pathing, especially when navigating to unexplored parts of space. Due to some sort of rounding-off in calculations, I sometimes only get a range of 19 tiles, with 1 tile of range disappearing god knows where. While this may not sound like a big deal, it absolutely is. If a rocket gets stranded in space, there is no way to recover it. You could always eject and save the pilot, but the rocket and everything in it are gone. Every tile counts, so use your range Wisely.

3) Life in Rad –

Let's now take a look at the interiors of the rocket and go into more depth on the layout.

We are constantly short of space inside the rocket and must use it wisely. Since we have no plans to let the duplicant land on any planet but home, atmosuits are unnecessary. To save space, we allocate the same location for the rocket control station and the bed, where one has to be dismantled to make space for the other. The rocket control station is mandatory for takeoff but not for travel, with the only side effect being that the rocket will go at its minimum speed with none of the piloting bonuses applying.





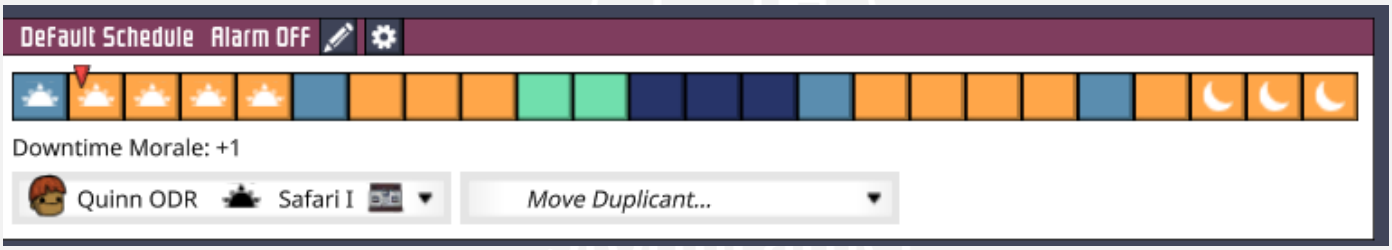
We have a gas pump and sensors to ensure the room doesn't fill up with CO2. I leave the fridge on the ground floor so that it can benefit from the CO2 atmosphere. The great hall is the only room bonus available (achieved with floating buildings, as in our last rocket build). Since the duplicant has a very low morale requirement, this is not a problem. As mentioned earlier, we have oxylite for oxygen, growing plants for food and a grubgrub for tending them. Just remember to keep your sulphur in a place where the grubgrub cannot reach it, or they will eat it.

As another quirk of ONI mechanics, telescopes work quite well within a rocket as long as they are placed to the side near the glass window. This is the best way to explore space, though it requires a duplicant to function. Not that duplicant time is an issue here, as the duplicants don't have much else to do. In fact, I always keep an orbital station and plenty of plastic on my exploration rocket, so that my duplicants can make data banks in their free time.

One major issue that I had not initially considered was radiation. Outer space is very unforgiving when it comes to radiation, with duplicants being bombarded with it. The central portion of the rocket is shielded, but the sides are not, especially under the gas water ports. I had initially assumed that the duplicant would take in the radiation as per the 3rd tile of the telescope, as that is where they seem to sit as per the animation. But it takes in the radiation as per the centre, which is bad for us. Duplicants can pee out 100 rads a day, but in this situation, duplicants will eat more rads than they can excrete, given that they will spend most of their day at the telescope.

I tried getting them to put on a radiation suit, but that's a terrible solution to use without a dock. Dupes in suits without oxygen cannot breathe normally in them and spend most of their time catching their breath.

I stumbled onto a cheeky solution almost by accident. I noticed that dupes lose 100 rads when they use a bathroom, which is usually once a day. However, no rule states that dupes can pee only once a day.



By adding 4 bathroom slots to their schedule, I encourage my dupe to go to the bathroom as often as they can. They can pee anytime their bladder is above 40% and they don't get radiation sickness.

4) Space Safari –

With our rocket ready and primed, we loaded it up and launched our dupe into space. 20 tiles are enough range to travel towards the corner of the map and take a small detour on your way back to maximize the explored area. Just make sure to keep 1 range as a buffer as I said earlier. It is possible to explore the whole map in 6 trips using this method.

With the rocket imaginatively renamed 'Safari I', we set off into the darkness of space. I am primarily looking for the Ice planet right now, which I know will have iron volcanos. Once I have it, I can land dupes there and get the iron.

No such luck for us through. By cycle 400, Safari I is on its 4th mission to space, but we have not found the Ice plant. We did find a few other things though

- Charoni (Cycle 317)
- Siftani (C318)
- Yuckios (C366)
- Calfazon (C375)
- The Temporal Tear (C395)

All the planets will be renamed once they're colonized. The temporal tear is closed though, and in any case, is not a planet. I wonder what it does….

When exploring space, unexplored tiles are of 2 types, half fog and full fog. Full fog tiles are completely unknown to us and could have anything. Half fog tiles, however, show a 'question mark' at the tiles that has some object in it but does not reveal what the object is. If you see a half-fog tile that does not have a question mark, you don't need to explore it.

5) Ranch Upgrade –

Our ranches have served us very well so far, but they're due for an upgrade. Our dupes are spending a considerable amount of time gathering igneous rock to feed the duplicants. Moreover, while we do have lots of food, I would like to bank up a bit more, in case there are some issues in food production down the line.

Thus, we automate our ranches, with autosweepers and conveyer receptacles to top up the critter feeders as well as autoloaders to pick up eggs coal and meet. The receptacles are connected to a loader in the evolution pool, which in turn is fed by a conveyer that goes all the way down to the bottom of the base. Right now, the system is not foolproof and I have to check periodically to see if there is enough igneous being picked up from

around the map. The simple solution, of course, would be to create a central logistics hub. And we will, at some point. But right now this is good enough.

With this, we also increase the critter count to 8 critters per ranch (from 6). We have also added an extra ranch. The doors of the ranch are now unnecessary and can be demolished. But since that would disrupt the functioning of the ranches, I've decided to let them be for now.

6) Life on Neo Terra -

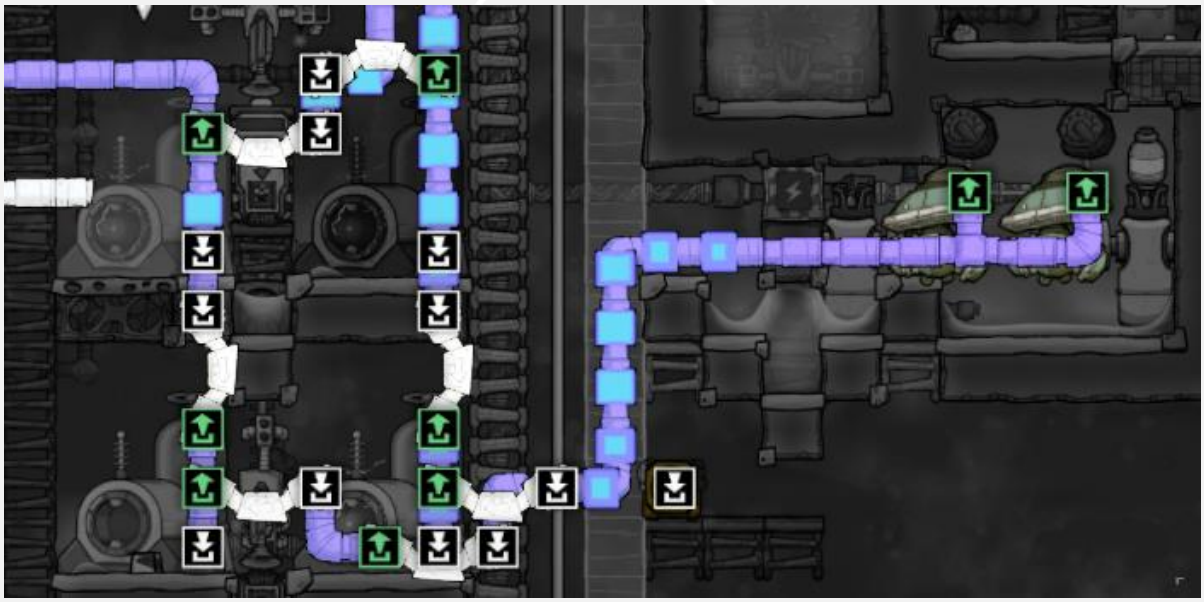
Apart from the ranches, we have made a few more changes to Neo Terra.

We now have a spice grinder added, and the room upgraded to a kitchen. While the grinder placement might look awkward, it's to ensure that the autosweeper can supply food from the freezer. I haven't started using the spice grinder yet, but I will.

Apart from that, there has been a much of digging and other regular checks and updates that are too small and insignificant to get into. Here are some major changes –

- Increased oxylite production –

  Over time I noticed that despite having 2 oxylite refineries, the Rodriquez was not at 100% utilization and the oxygen often banked up in pipes. To make better use of the available resources, I added 2 more refineries to ensure we are running at maximum capacity. If you have a shortage of input resources, I would not recommend this. But here I have plenty of water and we have gold volcanos in Chernobyl.



  As a side note, this excess oxygen production caused an excess production of hydrogen, to a point that my 3 generators could not handle it and backed up the whole system. I had to add 2 more pumps to get it back up and running.

  Also, When an atmosuit gets worn out, the oxygen in it gets dropped as a canister. As such we have hundreds of kgs of oxygen lying waste in our base. To use this up, I added an additional airlocked room where the duplicants go to empty out any oxygen they found.

- Ad-hoc reed production –

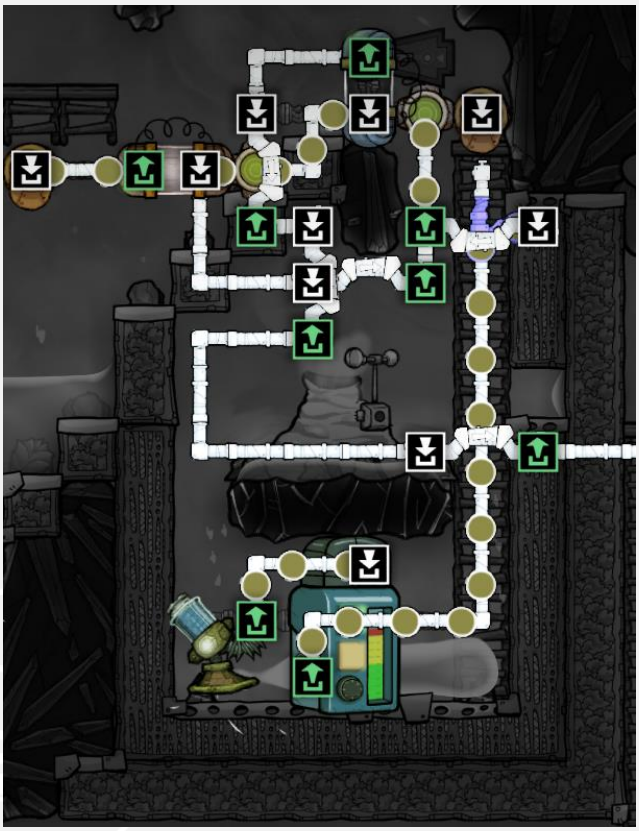
We have pockets of polluted water all over the map. As a general rule, I like all my liquids to be centralized in one place. I could pump this into my water filtration network, but we have more than enough water already so that would be a bit pointless.

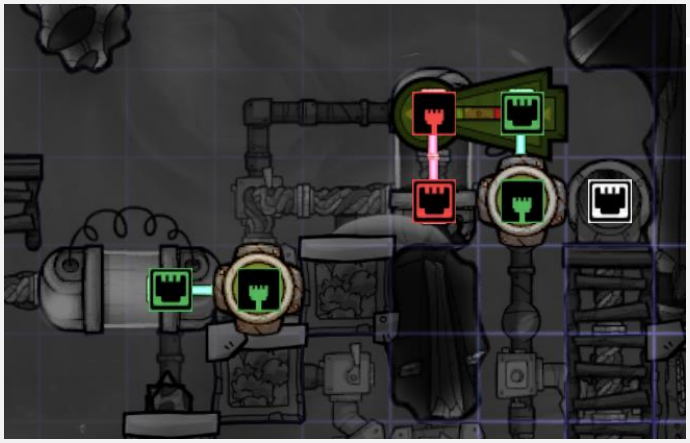
What we can do is grow thimble reed. We've done this before in Petra. We do not have a permanent production unit for the thimble reed, and we are currently running on the reserves we built from previous temporary thimble reed setups. The difference with this setup was one of the pools of polluted water was a little too cold and had to be warmed up a bit for use.

To keep things simple, I built the reed in a hotter area, to let the ambient air heat up the water a bit. Here we have a risk of the water getting too hot or too cold, so I had to make a system that allows the water to circulate. The tank averages out the temperature of the water and prevent most lock-ups. The liquid shut-offs are not necessary, but the automation prevents too much water from being added to the tank.

The 2nd Shut-off was to add hot polluted water, but I ended up not adding that feature to the build.

- The polluted water vent has been harnessed





We have more than enough water at the moment, but I decided the harness the polluted water Vent anyway. I use a very simple powerless filtration system that you have seen before for my natural gas in Petra. It basically consists of an infinite loop with 2 outputs. One is for polluted water, and one is for anything that is not polluted water.

This lets me pick out only the desired liquid, at 10W of power, instead of 120W. The water is at a good temperature for thimble reed production. I may use it for a dedicated production facility if we have no other use for it going forward.

CH 9: Whole New Worlds

- The whole map is gone

  As you might have noticed, basically the whole map has been dug up at this point. I've left the Ice biome and the space biome untouched. I've also left a lot of plants all over the place but everything is now rubble.

  Some people find the amount of CO2 in my base alarming, but that's just how I like it. Having a single gas is a good way to prevent the game from slowing down or hanging as we make more complicated things. The best thing to do would be to have no gas at all, but that would require a lot of pre-planning which we cannot do at the moment.

- We build a bunch of rockets

We build 4 rockets that we will use for our colonization effort. Honestly, I only made them because my duplicants did not have anything better to do. I don't think I'll need these rockets anytime soon but when I do, they'll be ready.

Just to clarify, the interiors of the rockets have not been made yet.

- We build a new critter pit

A critter pit is basically a place to dump all your wild critters so that they're easy to find, easy on your computer and critters don't eat what they're not supposed to.

Duplicants can add eggs into the pit via a conveyer. For this reason, the duplicants mustn't have access to the chamber, or they'll go into an infinite loop.

This pit is not for swimmers or fliers. The petrol is just to restrict the movement of dreckos and pips.

7) Life on Petra

Some major changes have happened in Petra as well.

- Plumbing in bathrooms

  Duplicants in Petra were actually using outhouses all this time. We have finally upgraded them to lavatories. The water comes from the input water from the teleporter. The output is dumped into the water pit.

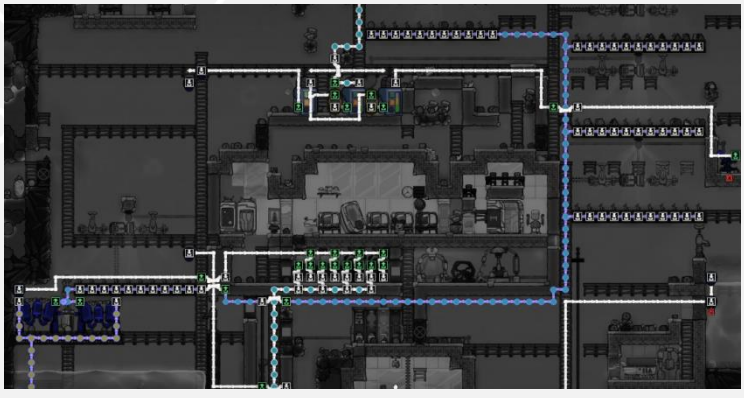
- We found a natural gas geyser

  Since we already use natural gas for energy in Petra, and we were running low on it, this is good news for us. All natural gas is now on a pipeline, and we have an infinite storage for the geyser gas. The system is built such that the geyser gas is used only if oil wells don't have enough.

- Digging and cleaning

  A lot of the map is completely dug up well. We've also pooled all our liquids into separate areas, though there is still some minor contamination here and there.

- We grow a lot of bristle berry

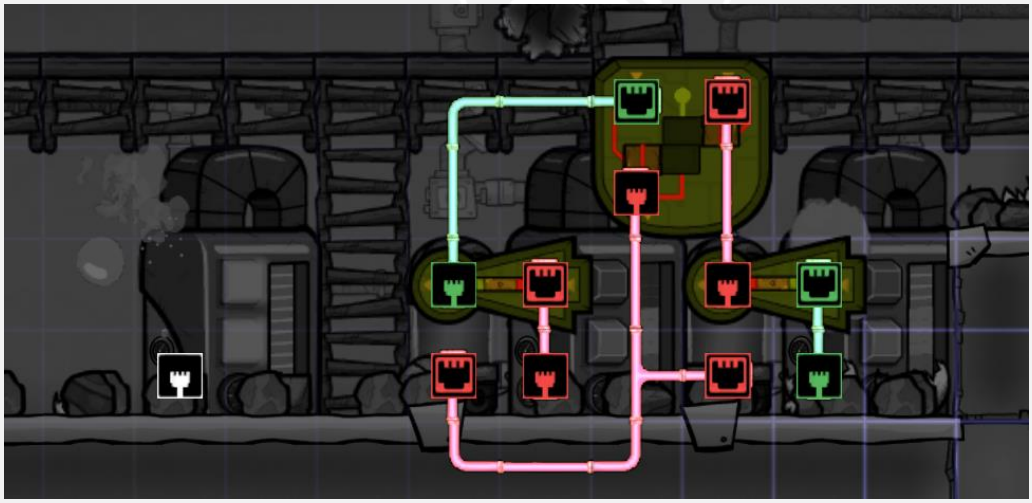


So this is the main highlight on the planet here. We had a lot of water, so much so that it was practically overflowing. And while the lower half of the planet may be warm, the upper half is pretty cold.

Most of the water was polluted water, so we could have just used it to grow thimble reed. But this would have had some issues. For one, the water temperature would have been too low for the thimble reed. For another, we don't need reed. We need bristle berry.

Berry sludge, made from sleet wheat and bristle berry is the only unspooling food that can be made by duplicants. And we will need a bunch of it as we colonize other planets. We have enough sleet wheat banked up, and we'll have access to more on the ice planet. So for now, bristle berry is the limiting factor.

With bristle berry production in mind, I planted a bunch of plants across the map. The plants need very little water but do need lights to grow. The temperature around the plants should also not be too hot.



At this point, I had 2 pools of water. One was very close to 0 and the other closer to 40 degrees on average. I decided the most optimal way to use the water would be to mix them both in a 1-to-1 proportion before use. With that in mind, I created an automation system that only sends out equal amounts of water from both temperatures, and mixes them together before discharging it. If the water runs out at any one source, no input will be sent at all.

This would not only make optimal use of the available resources but also maximize bristle berry production. To cut down on duplicant labour, I added conveyor rails near the plants. All bristle berry is transported via a teleporter to Neo Terra.

8) Life in Chernobyl –

Practically nothing has changed in Chernobyl. We sent a few rocket missions there to pick up some gold, but that's about it. It is not connected to any sort of interplanetary logistics network at the moment, but that will have to change at some point.

9) Base Check –

Since we have hit 400 cycles, let's take a bit of a deep dive into the base and see where we're at right now.

- Food-

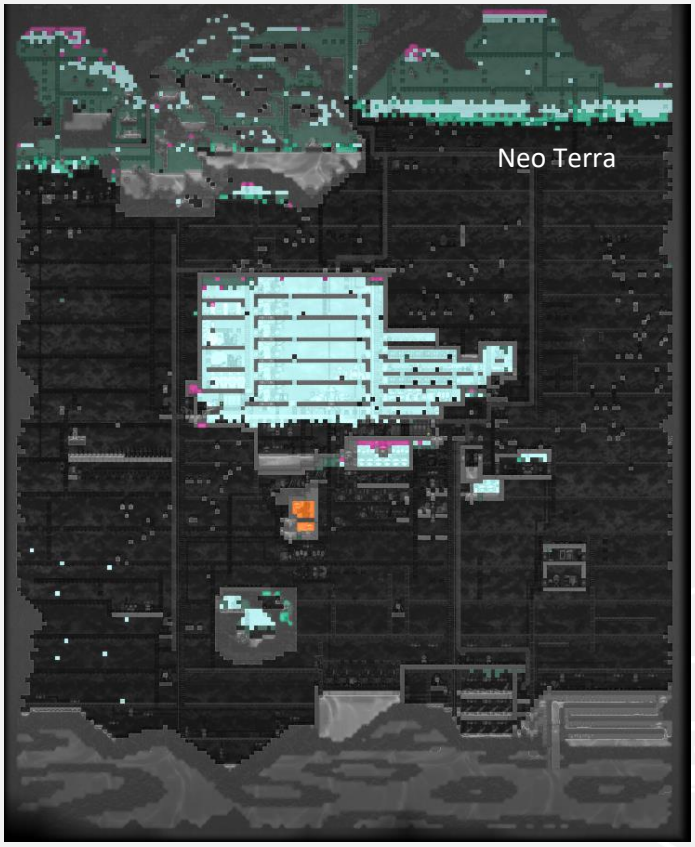
  We have plenty of food, but mainly on Neo Terra. We do not have any automatic food transport system yet, but we have been able to manage it with manual intervention so far.

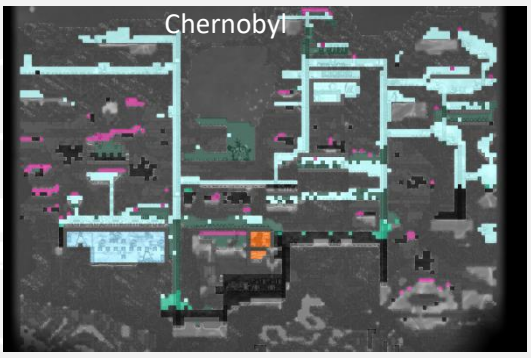
With 17 duplicants, I need 17,000 kcal a day, which means I can survive for 176 cycles on what I have. So even if for some reason my food production gets disrupted, I have enough of a buffer to get it up and running. Keep in mind that a system of ranches could take up to 50 cycles to function at full capacity

- Oxygen-

  Contrary to what the gas layouts might suggest, Neo Terra and Petra have the best oxygen supply of our colonies. Oxygen is produced in Neo Terra and sent

to Petra by teleporter. Chernobyl is currently relying on algae supplies for oxygen and does not even have an atmosuit network yet.

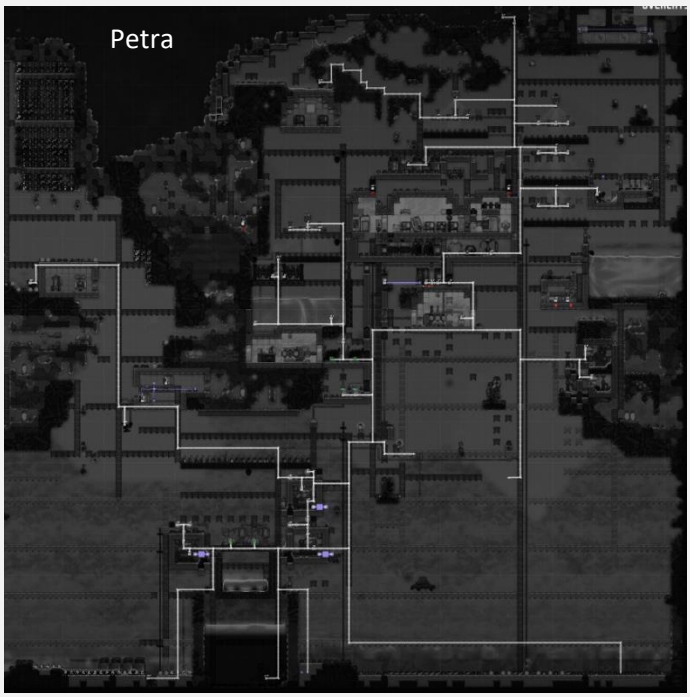


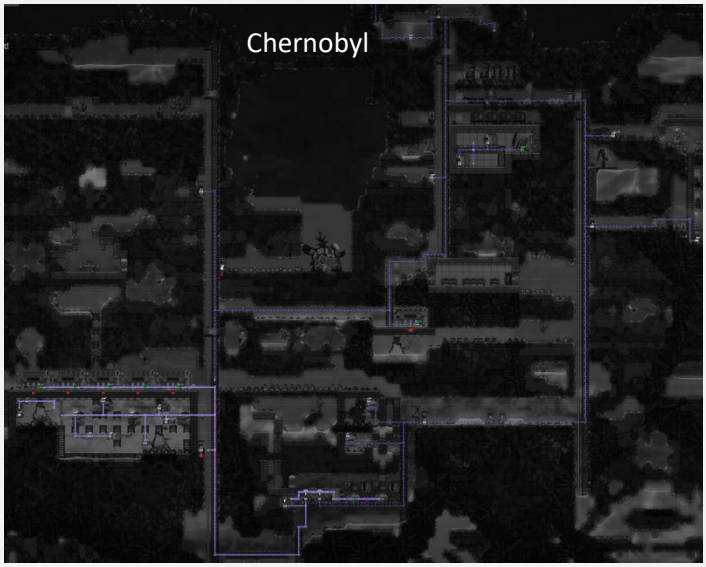


- Electricity-

  All 3 planets have relatively stable sources of power. Obviously, Neo Terra has the best energy security, with an abundance of multiple fuel sources, the most important of all being petroleum. Chernobyl only has a Natural gas geyser right now, and overuse might cause it to run low in the future.

  Another point to note is that Neo Terra has a grid that is built on heavy-watt wires, but the other planets rely more on the wires and the conductive wires.

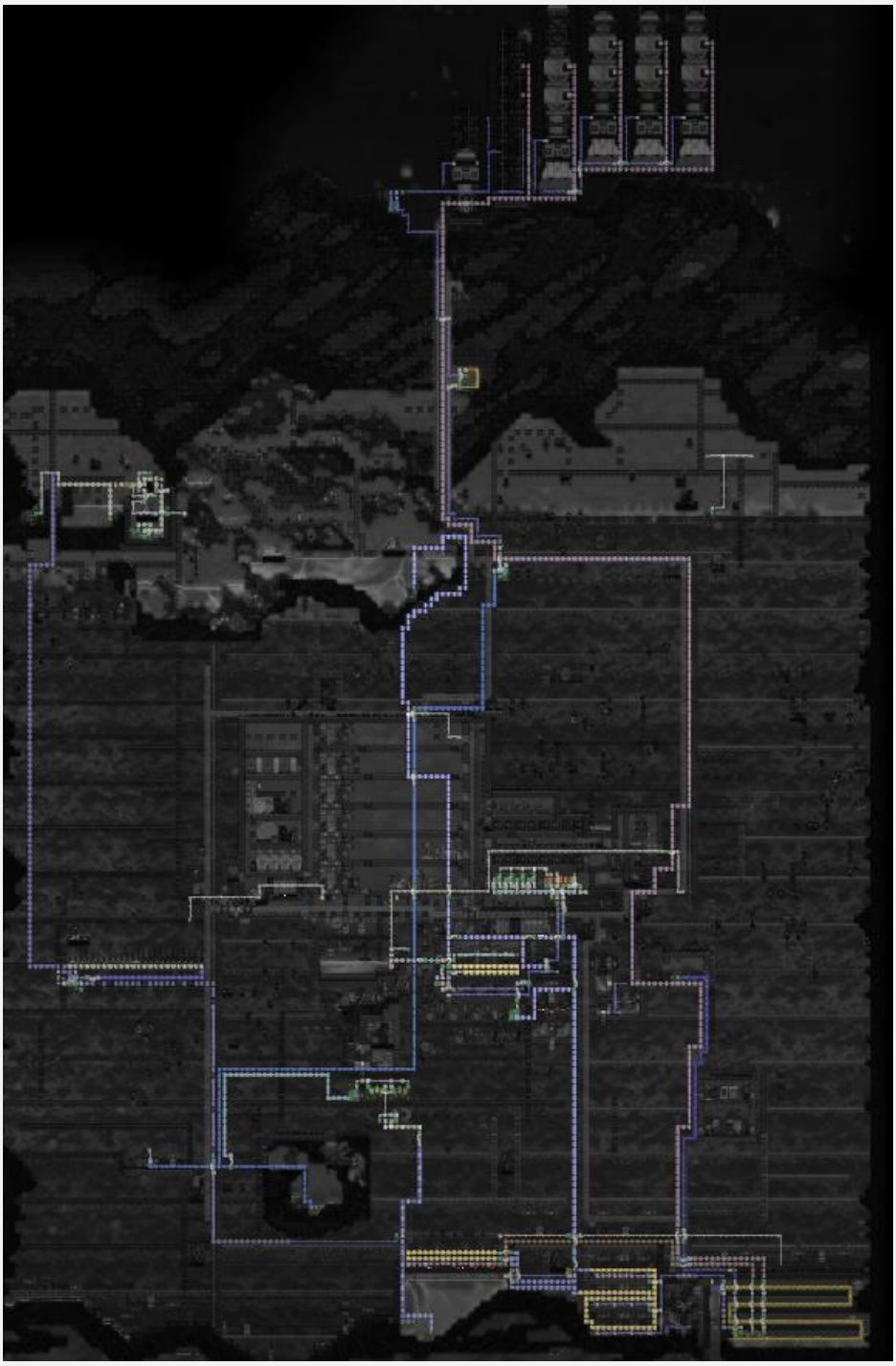




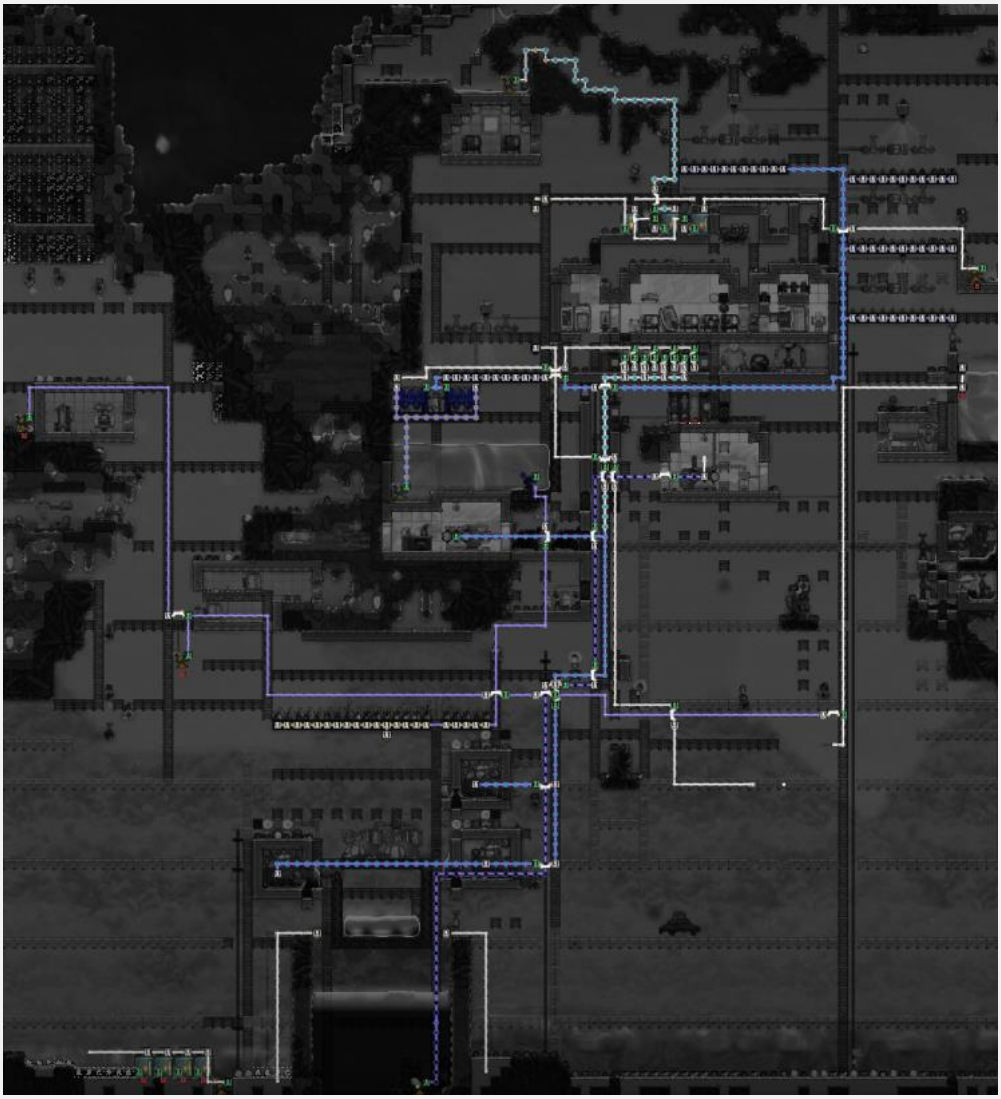
Plumbing

Again, no surprise that Neo Terra has the most extensive plumbing network, carrying crude, oil, petroleum, water, polluted water and so on.

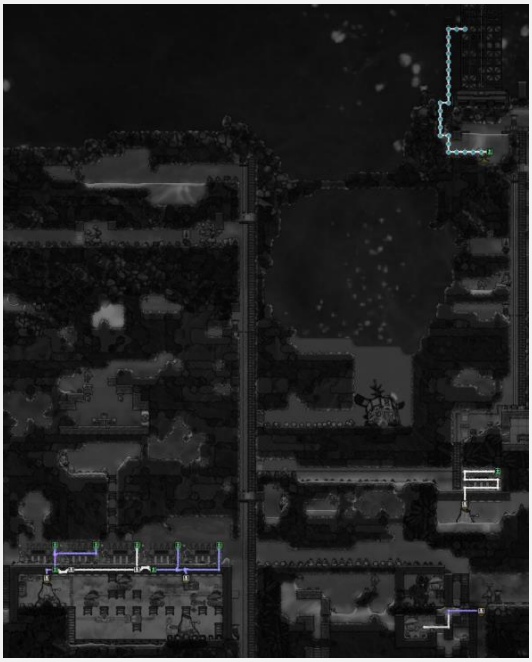
Petra has a minimal network, thanks to its crude and bristle berry production network.



Neo Terra



Petra



Chernobyl

Conveyer rails

The conveyor system is not particularly developed anywhere. There is no functioning rail system in Chernobyl.

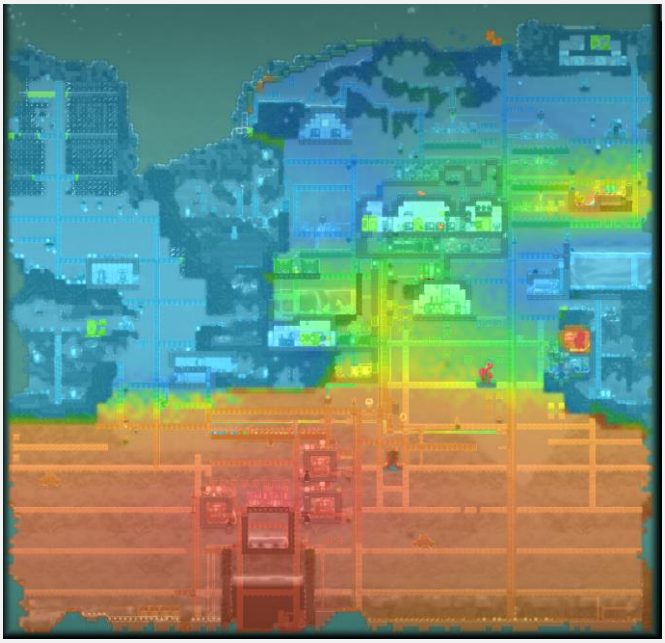
Neo Terra

Petra

Temperatures

There are no alarms to be raised as far as temperatures go. Yes, some areas have gotten hot, but that's fine, our duplicants have atmosuits on 2 planets. We did have to put some cooling for our petroleum generators on Neo Terra though. Usually, this is not a problem as I usually make them out of steel, but now we've made them out of gold amalgam, which needs some cooling now.

Neo Terra



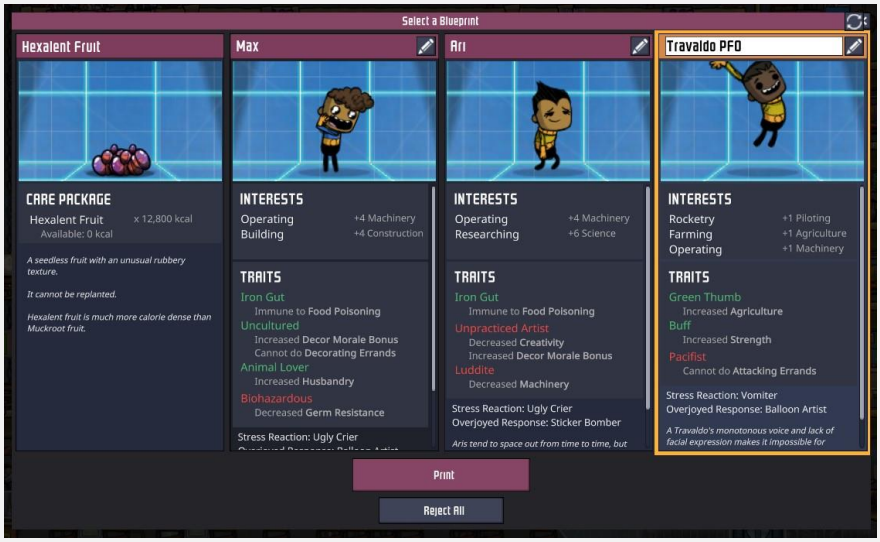
Petra

Chernobyl

The following tech was researched

- Multiplexing
- High-velocity transport
- Radiation refinement
- Solid management technology
- Pressurized forging technology
- Jetpacks technology

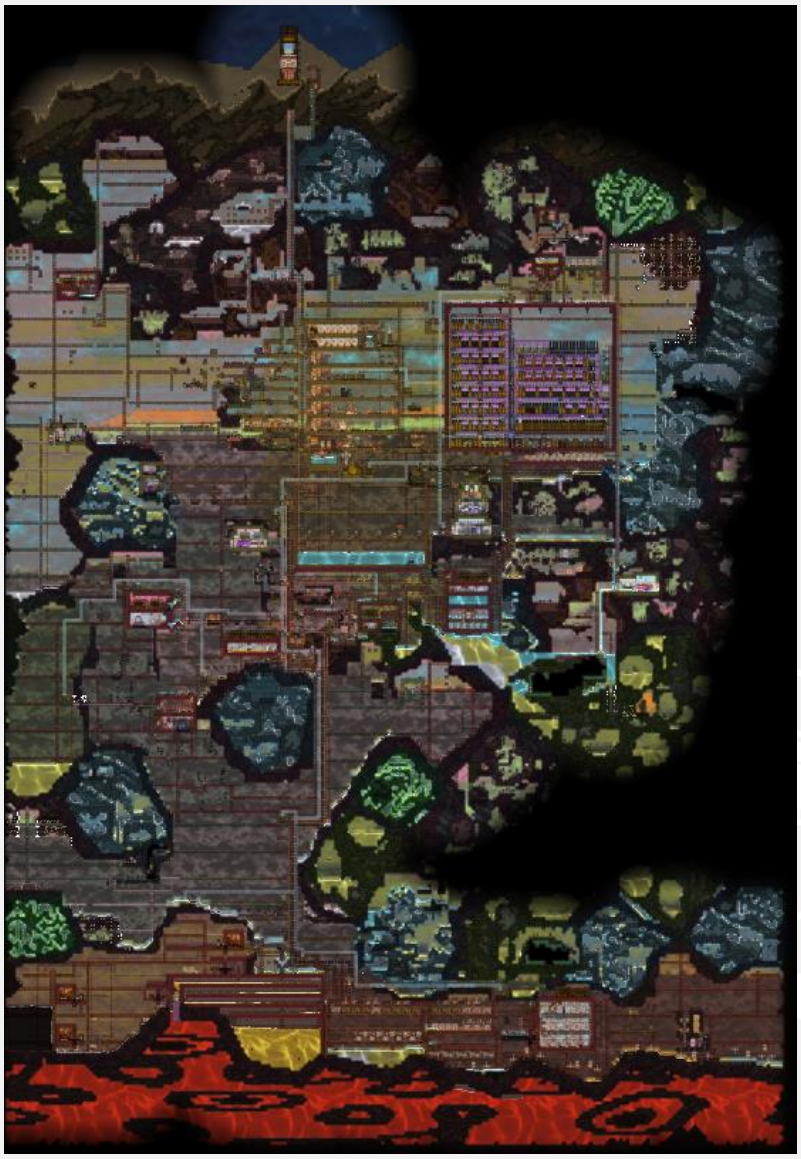
10) <u>Meet the duplicants-</u>



We've picked up 1 more duplicants this chapter, bringing the total up to 17.

Nothing very special about them, but they are a solid dupe

11) Comparison To The StormFather's Guide to the Galaxy-



We now see a big deviation in style and philosophy when comparing PSS to SGG. In SGG, we had already moved to beautification, décor and longer breaks for duplicants. This was because the planet was quite stable and I felt that was the right thing to do. In PSS on the other hand, we have done nothing of the sort. We are still working on simple but effective base layouts that we built quite early in the game and with our focus on space, we have a lot of work to do before the comfort of duplicants is something I'll worry about.

My next focus in PSS will be moving towards more planet colonization and nuclear energy, post which I can work on an interplanetary logistics network.

Author's Note –

Thank you for taking the time to check out Project Shatterstar. I hope this helps you to up your game. Each episode will be updated when necessary, so do keep an eye on the change history.

This series is a labour of love and an attempt to create quality written content. It does take up a lot of effort, though, so If you do like the work, please share and recommend it actively. You can also support me directly if you are willing and able.

There is always scope for improvement and new perspectives, so I encourage you to reach out to me if you have any specific thoughts on the work, be it good, bad or ugly. Reddit is the best way to get a hold of me. Do follow me there to keep up to date with the latest on what I do.

Check out the 'Stormfather's Guide to the Galaxy' and 'Academy Not Included', both of which are series that I built on Reddit. SGG is now scrapped, thanks to some complications when Spaced Out came out of Beta. But ANI will continue in some form or another.

Reddit is also the perfect place to point out any errors in the file. Due credit will be given to those who find errors or provide feedback that is incorporated into the file.

To check out any past or future work, or to support or follow me, do check out the following link-

https://linktr.ee/Stormfather

Until next time

Change History –

Date	Version	Change	Credits
7th Nov '22	0	New Release	-