

DYSON SPHERE PROGRAM

# DSP guide to pre-planetary logistics

## An organization method for starting players

By Vesparco



### Introduction

This guide aims to help those players struggling in the early game before reaching planetary logistics. While this guide does not focus optimized or compact layouts, it provides a framework of planetary setup that will help players consolidate their items and resources until they are able to reach comfortably the planetary logistics setup. This guide targets specifically those who:

- Become a victim of the spaghetti factory layout.
- Rush the tech tree without establishing the necessary productions on the way.
- Over-manufacture through Mecha's Replicator (item cues of 300s or more).
- Aim to build huge factory setups when players capabilities are minimal.

For veteran players, this guide may provide an interesting view into the early game and hopefully some inspiration in the use of game elements that can be overlooked once planetary logistics kicks in. In this topic you may find uses of splitters and sorters in a few original ways.

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### **What this guide aims to provide**

- A guideline for the coverage for the first three tech levels.
- A way to cope with the build limitations of early game
- An introduction into the “Polar-Tropic” circular belts and the dynamics derived from it.
- A production setup robust enough to provide the necessary ingredients to leap into planetary logistics without too much effort.
- A variety of setup design concerning belts and sorters.

### **What this guide will not provide**

- A detailed guide into optimized layouts.
- Discussion into planetary logistics.

The motivation to avoid these topics is that there is plenty of information already available and made by people better suited to approach them.

## 1 - Game start - Touch down and hemisphere selection.

So after the touchdown you start rushing to mine and begin your setup. Good, but just take a moment to do some planning.

Take a good look on the planet for the following things:

- Water bodies distribution.
- Landmass availability (land with and without resources).
- Resources distribution.
- The situation between polar and tropic radius (see picture below).

The aim here is to find a suitable point to start your base. With plenty of resources in the vicinity and enough space to build. Try to avoid tight spaces due to landmasses or resources as these constraints are hard to come by until you have enough soil and foundations to fill the gaps.

Your interest should focus especially on the polar-tropic regions of the planet, as it is your desired position to build your base. By Earth references, it should be the space between the North and south poles and their nearest respective tropics.

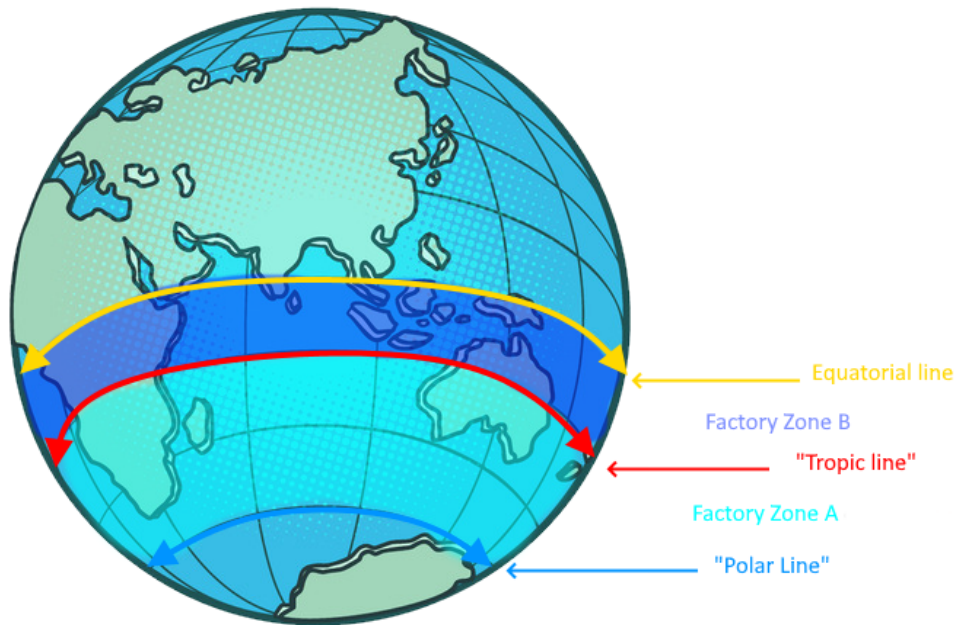
Once you have identified your position, consider the side of that planet your starting base perimeter. Boundaries are not mandatory, you can grow bigger if needed but this enables the following planetary organization (consider the "Active" zone your pole selection, either being North or South):

- Active polar region: Logistics and initial science.
- Active polar circle: Space for your **Polar circular belt**.
- Active tropical region: Your factory.
- Tropic circle: Your **Tropic circular belt**.
- Active Equatorial region: Your factory expansion, if required.
- Equator: Most probably your space for solar setup
- Inactive hemisphere: Free space for exploitation and future planetary logistics build.

Here you can also:

- Place miners to drive resources to the active region.

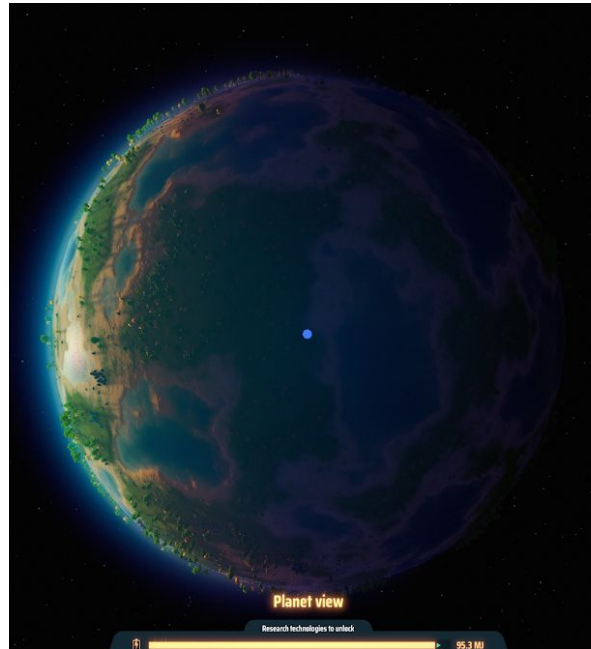
- Place foundations to gain solid.
- Solar/wind array placement if desired.



From our practical case we have the north side:



And south side:



We chose the south by the previous points, as it provided more land mass and a better setup in terms of resources.

### **Alternative route - Two polar belts**

While the tropic approach works, the length of the circular belt is quite considerable. An alternative solution is to do another polar belt on the other side of the planet. This would ease the time into setting up the belt, but bear in mind you will have to cope with longer belts to reach the other side of the planet. Also, you will be near smaller grids to build oil and chemical industries, which are bulkier than smelting and assembling. Despite that, this setup will still liberate the equatorial plane of the planet for later expansion into interplanetary logistics.

## 2 - The beginning of the factory - the Polar belt and blue science.

Start harvesting resourcing and manufacturing the basics. In this phase, the advice here is:

- To prioritize iron mining, iron plates and gears smelting. Having automation of belts crafting, even as a temporary build, is quite useful.
- Set a miner for coal and a storage, in order to refuel quickly with the best available fuel.
- Bring the resources with belts to the zone where your factory should start (zone A).
- Build a temporary base to push a little bit blue science.
- Build small setups to fabricate intermediate products (stone derived ones is important as you most probably won't craft them for the "jumpstart base" built).



Here our example of temporary setup for blue science

The main technologies to unlock are the ones in the "first column" of the tech tree. Take consideration also to get "**Improved logistics system**". The reason is that **splitters are a**

**must** for the polar belt build. Also consider **“High efficient Plasma Control”** in order to recharge through your energy grid and not depend on the coal charging rate. This is especially important as belt building is slow and very power consuming. Coal is not enough to sustain this activity without idle periods of lowered performance.

With the technologies unlocked, you are ready to start building the Polar belt.

## **The polar belt - Primary circular main bus**

The polar belt uses the concept of the main bus in Factorio. For those unfamiliar with the game, the idea is to provide a set of belts that become the “core” of the factory, providing output and inputs to each one of the factory sections.

This facilitates the management of resources. For example, having an initial input of “iron ingots” into the bus belt should reach all the machines that require iron ingots.

Also, the output (e.g. circuits) of one factory layout can be brought back to the main bus and then be distributed to all the other machines through the bus that require circuits as inputs..

The thing is that in factorio the implementation of this approach is linear, from a starting point and expanding in one relative direction, growing the factory on each side of the bus. In DSP this approach can be done but finds a lot of issues when trying to cope with the planetary layout. This however does not mean it cannot be done, but in fact, it has to be implemented taking into consideration the DSP planetary layout and mechanics. This, to our advantage, enables the design of a circular “bus” belt. This solution on a 2D game such as Factorio has some issues in terms of scalability but in DSP works quite well and provides a lot of advantages. To summarise the advantages:

- In a circular belt there is no start or finish, so any input/output can be added at any point. The only relevance of the factory position is the point of insertion to the circular belt. This helps to cope with layout problems when designing the factory templates. If the planetary layout is not adequate, you can extend the input/output belts into a lower latitude until you find a proper space to build.

- The compression of the belt (maximum load on the belt) has its own dynamics in the circular belt. DSP provides a lot of tools to manage it, which is a good thing. The splitters and the priority/filtering systems are the main tools on this topic.
- You can connect the whole factory setup to the belt in order to share their inputs/outputs. This helps to make your factory layouts modular.
- It scales well until planetary logistics kicks in (so sustainable until mass production is required).
- The capabilities of the circular belt grows considerably with higher tier belts. This provides great performance upgrades in the circular belt and attached factories with minimal effort. Also, tier 2 belt is quite capable of sustaining the demands of your early factory without major issues.
- Rows of belts can stack, so you can add quite a lot of items into the bus while remaining compact. Take in consideration stacking tech lvl 1 one is necessary to reach the third row.

Despite these advantages, there are some drawback that you must consider:

- This setup works well in polar positions as otherwise the circular belt becomes humongous. With the initial production and construction capabilities of the Mecha, an equatorial belt becomes a tedious task. This is undesirable as it takes longer to build it than its potential lifespan.
- Most of your factories will be able to receive one/two belt inputs of each ingredient so mass production is limited under such conditions.
- Depending on your circular belt radius, you will find some issues. Being too small (circular belt close to the pole), you will start having crooked belts due to cuadrularity mismatches and tight square patterns for building. Being too big (going near the tropic), you will have to dedicate a lot of time into finishing each circle.
- The “wider” (lateral lanes) the circular belt it gets, the more problems it brings. Due to this it is advised to not grow the circular belt more than five belt lanes.

This concept when applied, shapes like this:



Polar circular belt, 2h in-game, blue science automation achieved. Items in progress.

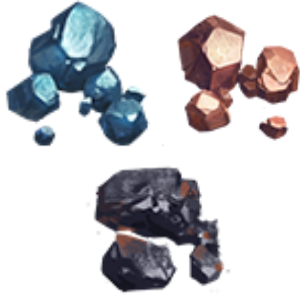
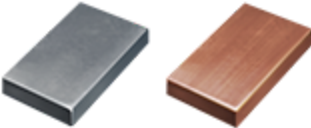
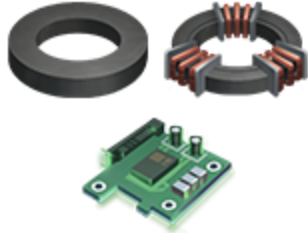

In this setup, we are aiming to build a polar belt of 5x2 (10 items). We could go higher to a third row on top, but the advantages are limited w.r.t. the complexity of management.

Although, in this setup the amount of items is limited and some compromises have to be made. To our setup we will do the following table. Bear in mind that some elements will not populate the belt until they are available on the tech tree, so you can build their respective belts later:

Polar Belt lvl 0					 1
Polar belt lvl 1					

<sup>1</sup> During testing we initially started with gears but Electric motors are better due to their intricate crafting (3 ingredients). Gears can be easily added to any factory complex (1 ingredient).

This setup is a guideline , you can apply the circular belt setup you see fit to your needs. This one is our consideration of what can be optimized in this form factor (and it most probably are better ways to optimize it). Some considerations below, in the selection process. Order is a bit arbitrary, although some advantage can be achieved by stacking output products on top of input ingredients.

Ingredient	Evaluation	Suggested belt level
	<p>Unadvised as despite the use of ores in the belt simplifies the insertion of mining products. the conversion weight is added to the factories that will take them as output.</p> <p>The only debatable one is the iron ore as it is used for both ingots and magnets. Still it is better to have dedicated belts for both items.</p>	<p>To be avoided, to process them before insertion into the belt.</p>
	<p>Mandatory for a functional belt.</p>	<p>Polar belt, Ground level</p>
	<p>Basic ingredients for a lot of items. Two of them are used for blue science</p>	<p>Polar belt, Ground level</p>
	<p>As absurd as it sounds, Stone has some sense in the belt as it is the source of 4 different products: Bricks, glass, silicon and sulfuric acid. Bricks can be crafted on demand and not extremely used (so maybe a smelter or two will suffice to feed any factory you set up).</p>	<p>Polar Belt, second level</p>

With this setup, you should be able to produce most of the items you require, including a mall to provide for the most essential items. The "Jumpstart base" from YT Nilaus can now

be easily implemented by taking the circular belt items as inputs. You can also add some foundations assembly at the end to start managing small gaps of water and shores.



Our jumpstart base setup.

It is advised to check the section **“Annex-1 Some information about splitters”** and **“Annex-2 Living with circular belt dynamics”** in order to understand how to set up the input/output to the belt and run troubleshooting if problems arise.

For the polar zone, it is suggested to keep it for science and circular belt management (buffers, bypasses and storage containers). The cardinal meridian lines highlighted in the globe (N/S/E/W from the pole) can be useful to pump science ingredients through there. The advice should be to not build factories in these lines in order to enable the passage of “vertical” belts for red, yellow science and graphene.

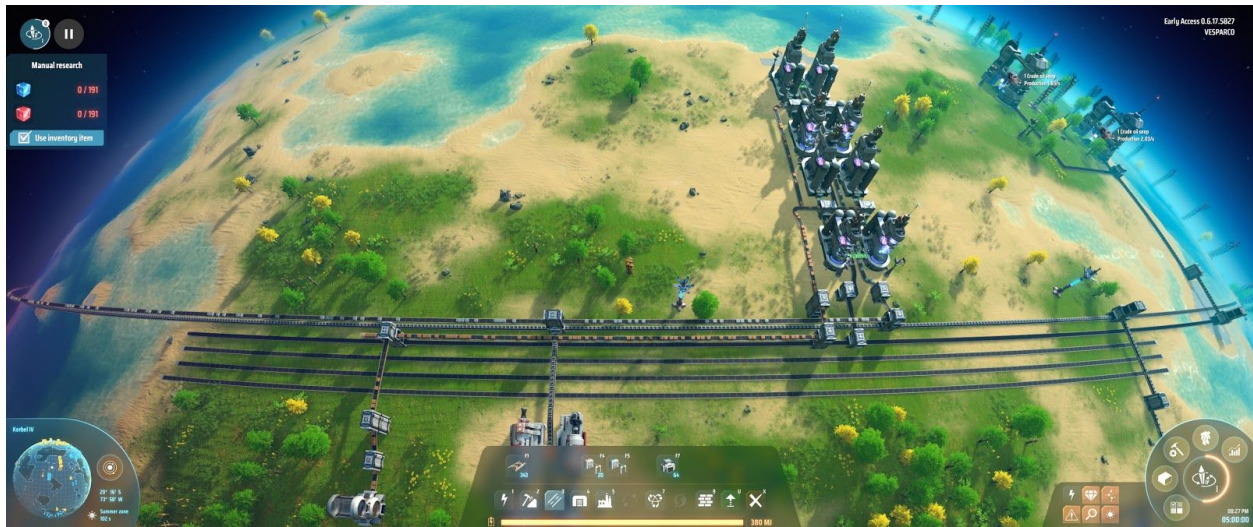
### 3 - Expanding to the tropic - the tropic belt and red science.

Once you are more or less your factory set up in the top and topped blue science, you can expand to the tropic belt. The tropic belt handles most of the products related to oil processing and should handle red and yellow science.

The suggested setup is the following one:

Tropical Belt lvl 0					
Tropical belt lvl 1					

As you will see the tropical belt construction is far more time consuming than the polar one. For these reasons I would suggest for now to keep it to the bare minimum (first two rows, and maybe not circular yet) in order to manage red science production. Light oil overproduction can be managed by tapping into the belt with liquid storage, as you can easily reverse the connection and feed the system when the circular belt is complete. To cope with energy issues some generators feeding from the graphite can help in the topic. Just remember to drive the coal mines and to set some storage in case of power failures.



Initial tropic belt setup and oil factory.

Once you start pumping graphite and hydrogen, set up your red science on top to start unlocking some technologies. Here the priorities are upgrades and some technological unlocks. Consider **“X-ray cracking”** to turn some light oil into more hydrogen. Also, **“Hydrogen cell rod”** can be pretty useful, as the best use of the titanium gathered by mining rocks is this one. The hydrogen fuel rods will help you a lot with your interplanetary trips and are powerful enough to sustain long construction periods.



Polar circular belt, 4-5h in-game, red science automation achieved.

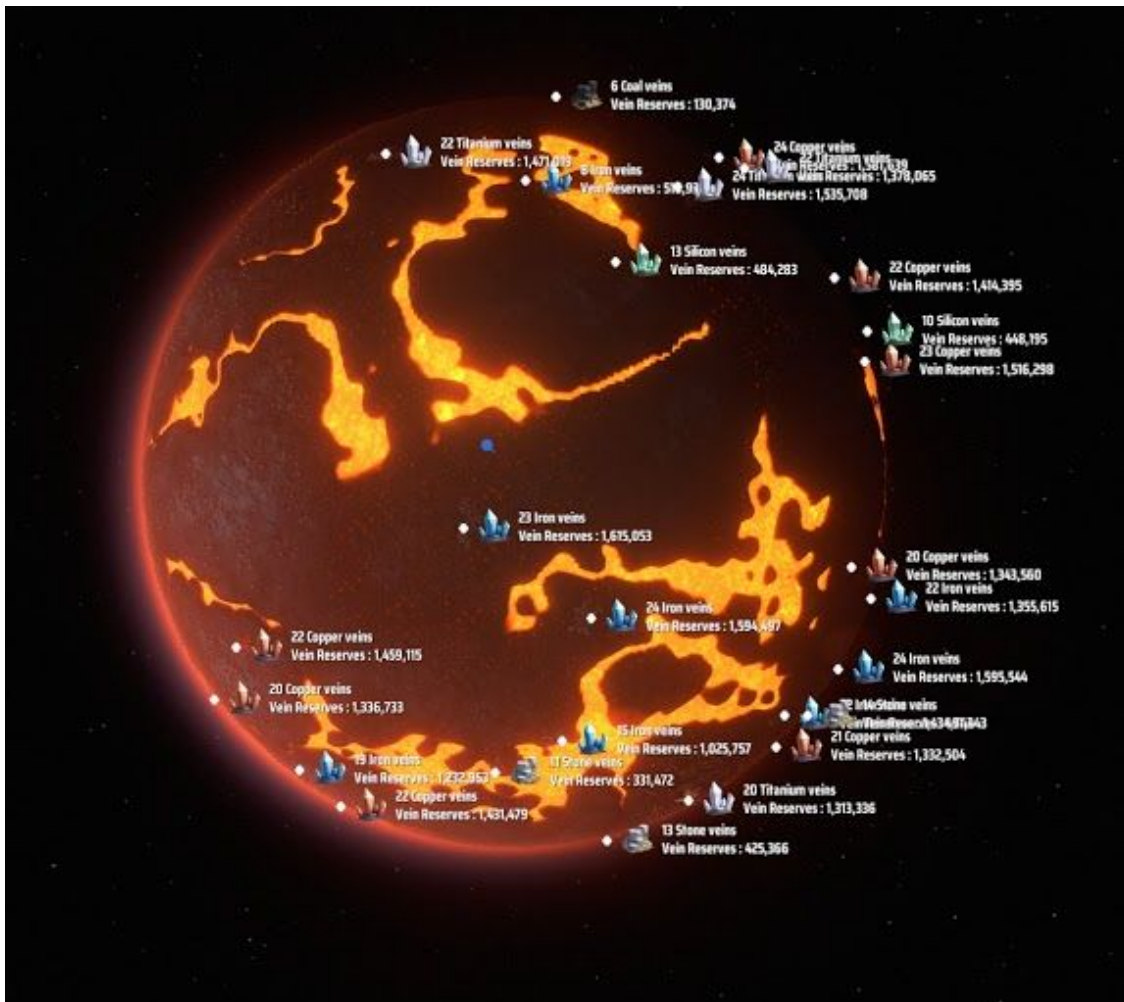
At this point you can choose, you can continue expanding your setup on the tropic belt or you can do a fast trip to the magma planet to set up another polar belt. The order is not relevant, so feel free to continue your own way.

## 4 - Trip to the lava planet

While waiting for the red-blue technologies to finish, we took the opportunity to go to the lava planet. This enables us to start on the polar belt of the manga planet and start gathering two very useful resources:

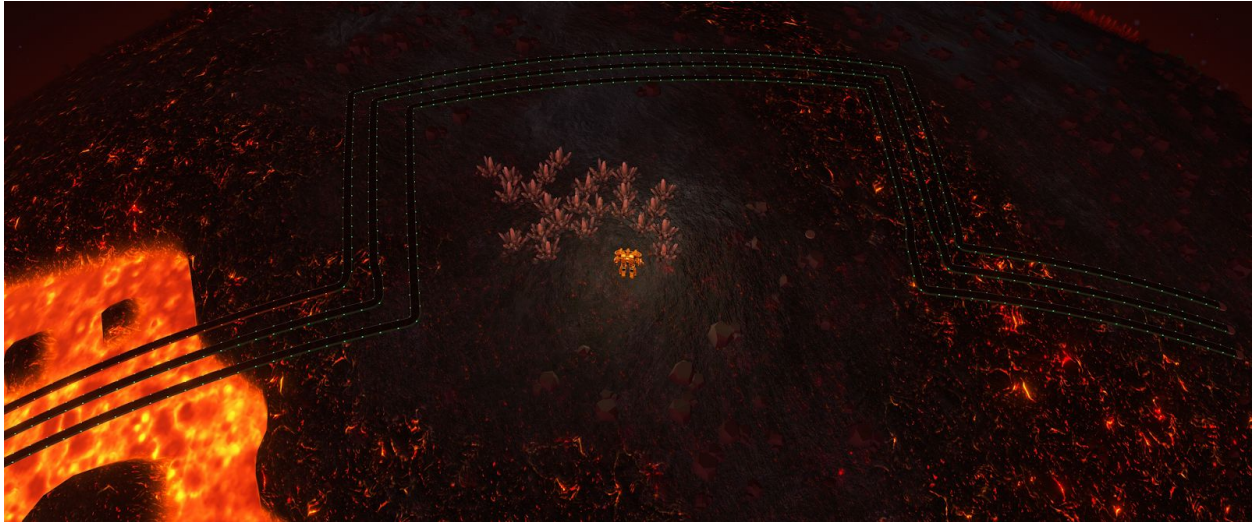
- Titanium ingots (to unlock yellow science).
- High-Purity Silicon (for industry, specifically for solar panels).

Here we did the same check as previously to confirm which pole is better. Here we also went to the south pole due to the two silicon sources available being in this region.



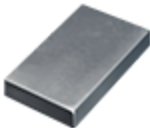

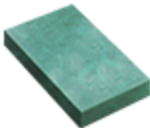

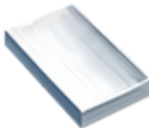
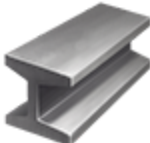

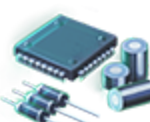

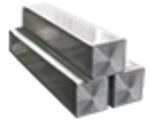
Magma planet south pole

Here we started building mining operations for the previous two resources and started laying out the circular belt setup. As it may happen, you may be interested in bringing foundations to cover obstacles or play with the belts to overcome them.



Belt deviation, one of the reasons to keep the number of lanes as small as possible. Finished at 8h30m in-game time.

Here the proposed **“Magma polar belt”** configuration is the following one.

Magma Polar Belt lvl 0					
Magma Polar Belt lvl 0					

Glass is considered if you want to lay additional industry that was complex to set in the other polar belt. Solar panel production is worth a lot here as you will be able to cover quickly the energy costs of your planets with them.

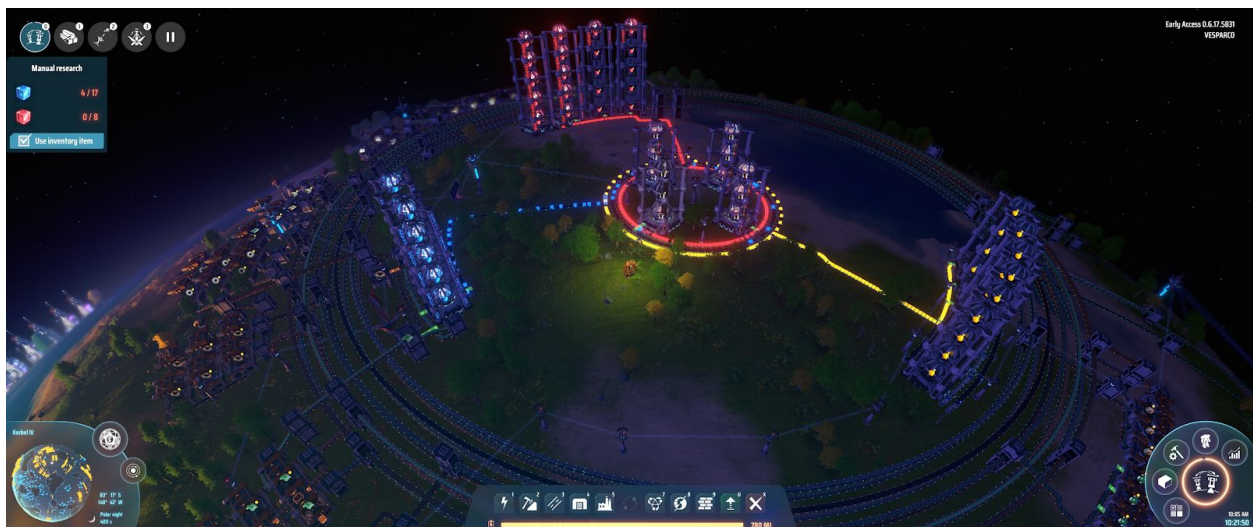
It is not required to build all the belts and every factory at once, and you will most probably have to do trips to gather belts. Use these trips to bring titanium back to the tropical belt.

## 5 - Finishing the tropical belt, starting with yellow science.

Now with the proper tech and if you set up a dedicated factory for belts lvl2, you will be able to finish the tropic circular belt in around 30 minutes. It is quite an endeavour, but once built you will be able to set up the remaining chemical factories. You should aim for a Stone deposit near the belt in order to set up the sulfuric acid production and another one for foundations (as stone is not present in the tropical belt).

In this phase you should be able to set up your yellow science and export graphene to the tropical bus.




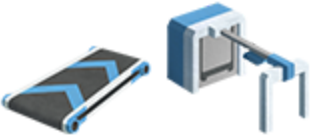
After this, you will have a clear belt reference to decide where your factories should attach to which circular belt. Some items may fall out of the three belt configurations but they are not critical to reach planetary logistics.



Polar circular belt, 10h30m in-game, yellow science automation achieved. High end items in the works.

## 6 - Last industries and close-up.

So at this point you will start unlocking yellow science. Take your time to set-up the remaining industries and storage for those outside the belt. With a few setups you will have ready all the ingredients to start migrating to the interplanetary logistics. Here a list of what is expected:

Topic	Comment
 <p data-bbox="284 777 592 808">Logistic drones</p>	<p data-bbox="677 609 1408 714">Can be crafted automatically through the belt in the magma planet. This a factory setup will be useful to mass produce them.</p>
 <p data-bbox="284 1008 592 1039">Interplanetary Vessels</p>	<p data-bbox="677 844 1408 987">Ingredients are Segregated between the three belts. All the necessary ingredients are available to pick so manual manufacturing or a manufacturing setup using planetary logistics can be easily set up.</p>
	<p data-bbox="677 1079 1408 1394">Particle container chambers can be crafted in the main polar belt. You can output into a chest and tap to it in order to manufacture the logistics hubs. Our advice is to ignore the basic ones as they are not "upgradeable" and you may find issues replacing them if you pack them too tightly (interplanetary ones need some spacing between them). Also the interplanetary hub offers more ingredients (5 instead of 3).</p>
	<p data-bbox="677 1430 1408 1610">With the polar belt, you can also set up the factories for tier 3 belts and sorters. It is advised to do so as any interplanetary setups you make will become "end-game", requiring few adjustments later on (e.g. Science labs stacking or Replicator upgrades).</p>

At this point you are at the end of this guide. The example run took approximately 13h to reach this point. It may not be the most efficient one but is one that is very flexible to meet most of the player needs. The last here would be to to start with interplanetary logistics to

start exchanging titanium between the magma polar belt and the tropical belt. In this manner you will feed all your industries there and start manufacturing the titanium alloy.

## Annex-1 Some information about splitters

As many people find out in unexpected ways, there are three splitter models in the game.



The three splitter models: We will refer them as “X” (left), “=” (middle) and “+” (right)

When placing a splitter, you can change the model by pressing “Tab” and rotate them with “r”. This may seem silly but is really important to this setup and there are still people surprised in reddit when seeing pictures. Another important information is that they are stackable, enabling an easier management of stacked belts.

For reference, each splitter occupies a level (0,1,2,3,..) and each level has two belt heights (A,B). This reference will help when organizing connections.

Then, this is how we suggest using them:

### **The classic, “+” splitter**

This splitter has 4 connectors, all in the 0A level, They are useful when for conveying lines and splitting sources. You most probably have experience with them in this manner. They are also useful for tapping the circular belt on the external belts (those facing the exterior).

### **The parallel “=” splitter**

Also 4 connectors but in parallel, 2 in 0A and 2 in 0B. They are most useful when building “ladders”, These ladders are splitter towers that help to bring a high level belt to ground

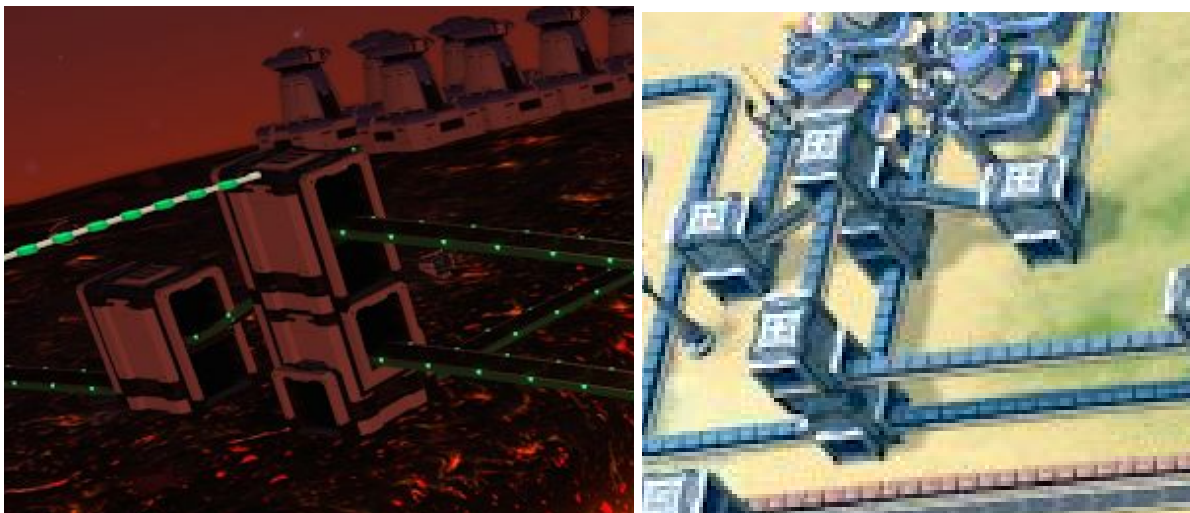
floor with minimal space. To do so, you must space them “buildable space+1”, which is the distance from one splitter that enables you to build one plus one square. The thanks to stacking, the space occupied is the same even if you go to higher altitudes.

Additionally to this, you can use them to build “one-loop smelters”. But this build is quite complex and the gain is so few so we will not cover them.

## The cross “X” splitter

This one is similar to the + splitter but has the perpendicular ports raised to 0B instead of parallel such as “=”. In this guide we use a lot this splitter to do three things:

- Tap into the circular belt, you can also use “=” to do so.
- Use it as a “ladder” while also providing a 90 degree turn.
- Segregating inputs/outputs in complex setups (e.g. light oil in refiners).



Some examples of ladders using = and X splitters.

## Working with stacked belts

It is worth mentioning that when used with stacked belts, you will have to stack splitters on each level even if only manipulating only one. For example, if we want to add an X to the level 0 of a three belt stack, three splitters must be placed in order to continue the chain.

Also, when placing belts, consider “up” and “down” arrows to adjust the belt height. If having problems, try to change the camera and zoom in as all configurations are usually possible but requires a precise pointing for the game to accept.

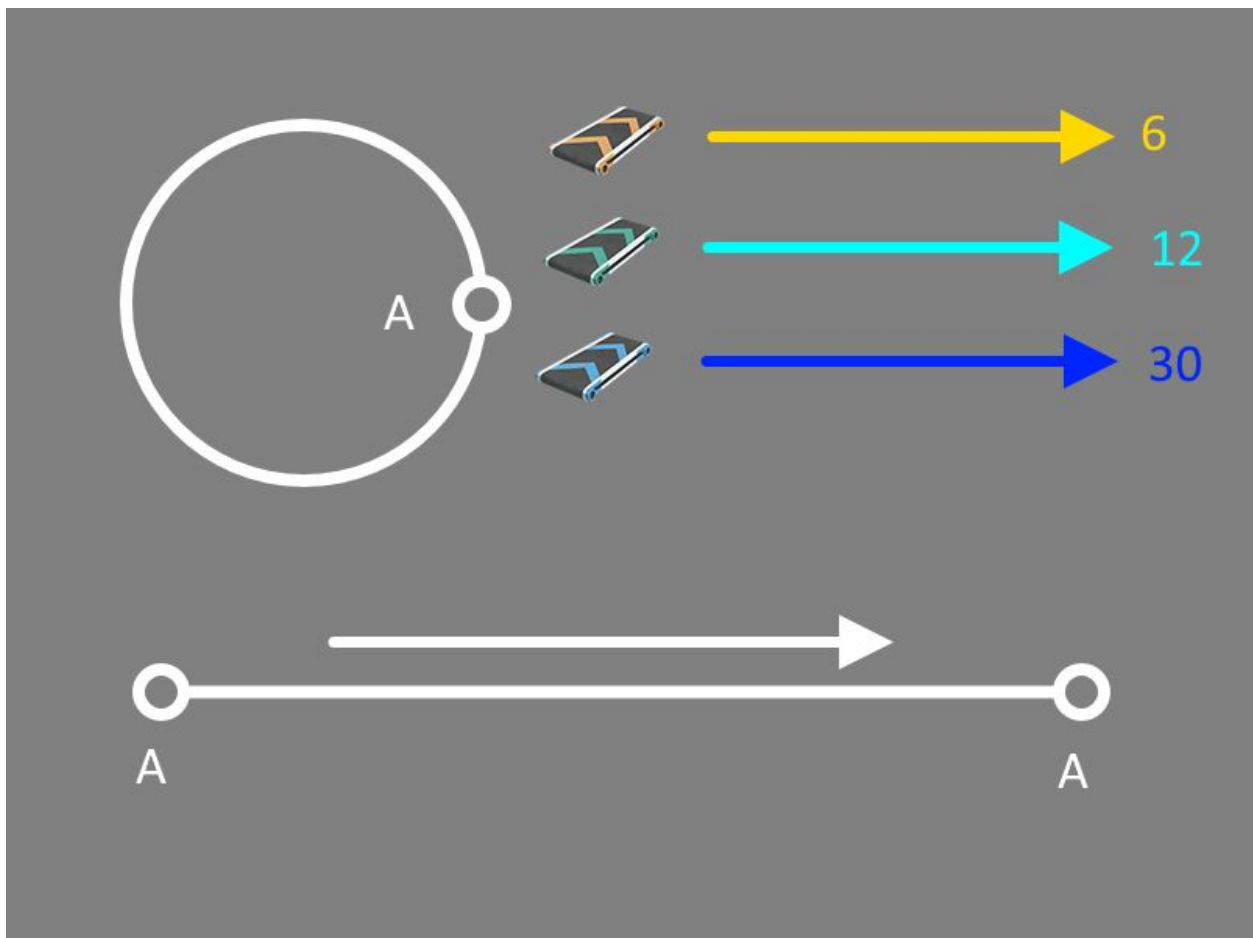
In terms of organization, use the height “A” (0A, 1A, 2A, 3A...) as belt space and the height “B” (0B,1B,2B,..) as the logistical one. This will help in the crossing between belts and buses without major blocking points.

## Annex-2 Living with circular belt dynamics

### Diagrams

As stated, the circular belt has some particularities so it is better to provide a dedicated section in order to understand how it works. First and foremost we will use linear diagrams despite being a circle for easiness of understanding. So as we can see that if we cut the circle in the point "A" we can draw the belt as a line, going from point "A" to point "A".

This line has a capacity factor, associated to each belt capacity. So a tier 2 belt will have a capacity of "12".



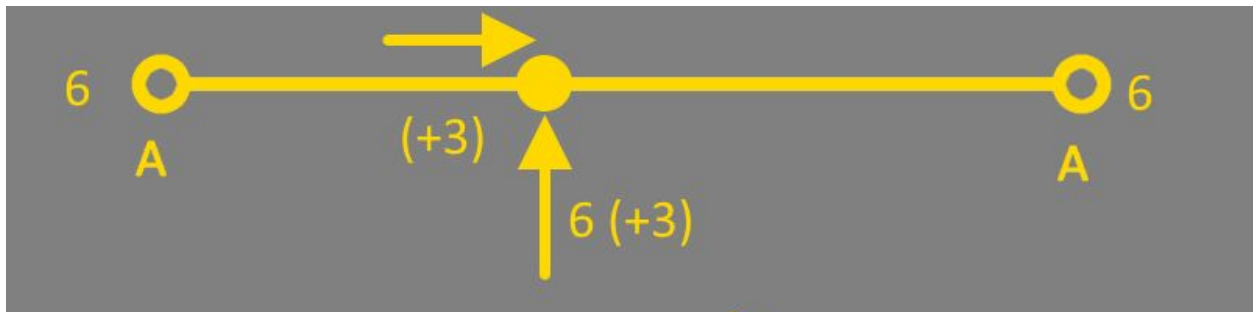
While it may seem stupid, assessing the capacity of the belt enables to analyze the impact of inputs and outputs to the belt. This is important as if we start to see "gaps" in the belt, we will be able to assess if it is normal or not.

## Inputs

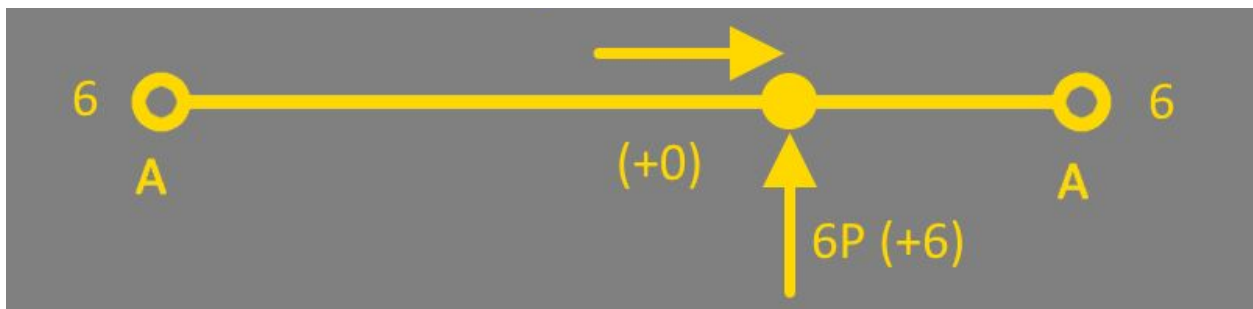
This section covers the management of inputs. The example is you have an input on the circular belt and you connect it. You will see two behaviours.



When the belt is empty you will see that all the input is absorbed by the belt. If not driven out by consumption, this input will return once it finishes a lap, so you will have a full belt.

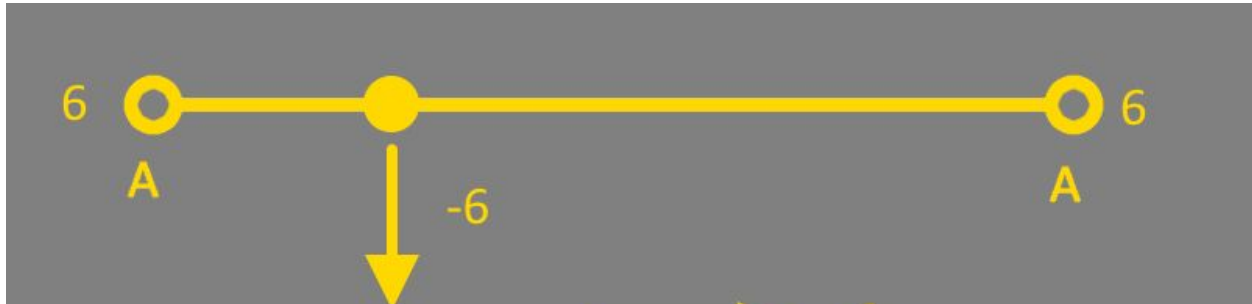


From that point, the splitter will do its job and will split the input between the one already in the circular belt and the one of your input, reducing your input to a 50%. This is of course undesirable as it is not filling the belt and part of the input is recycled. To solve that, you must prioritize your inputs, so they will always enter the belt if possible.

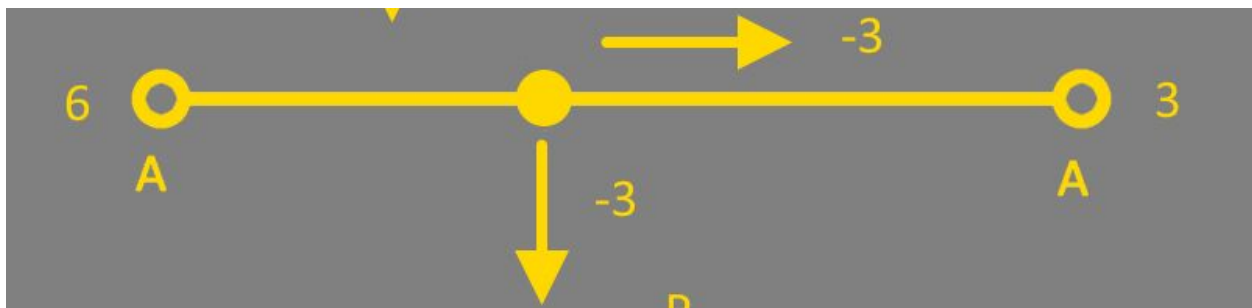


## Outputs

Same principle applied to outputs. When you tap from a full belt, the output will be at full capacity.

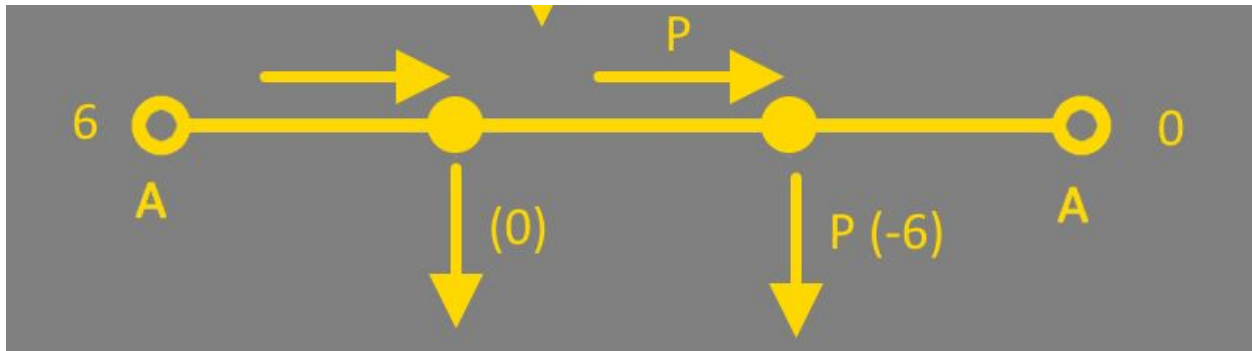


This will stay if the capacity of the belt is compensated, otherwise you will start to have a splitter behaviour. Taking half of the capacity of the belt while the other half remains in the belt. This is not a big issue as is the balanced approach. All the outputs of the belt will work even if scarcity of resources (or lack of compensation) or lack of compensation.



Despite that, if you want to manipulate its behavior, you can change the priorities of the outputs to have two behaviours. You can either:

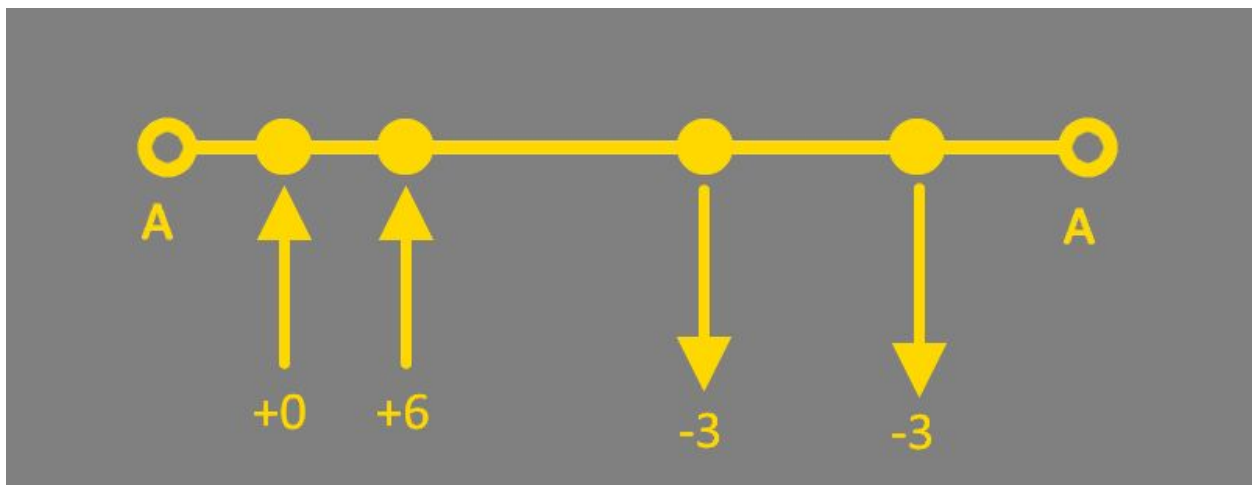
- Prioritize the belt (left case) disabling that section of the factory if the belt is not at full capacity. Only the excess will go to the factory.
- Prioritize the factory (right case) the factory will absorb all the belt. Only in excess, the remaining resources will remain on the circular belt.



### Belt capacity - behaviours and tactics

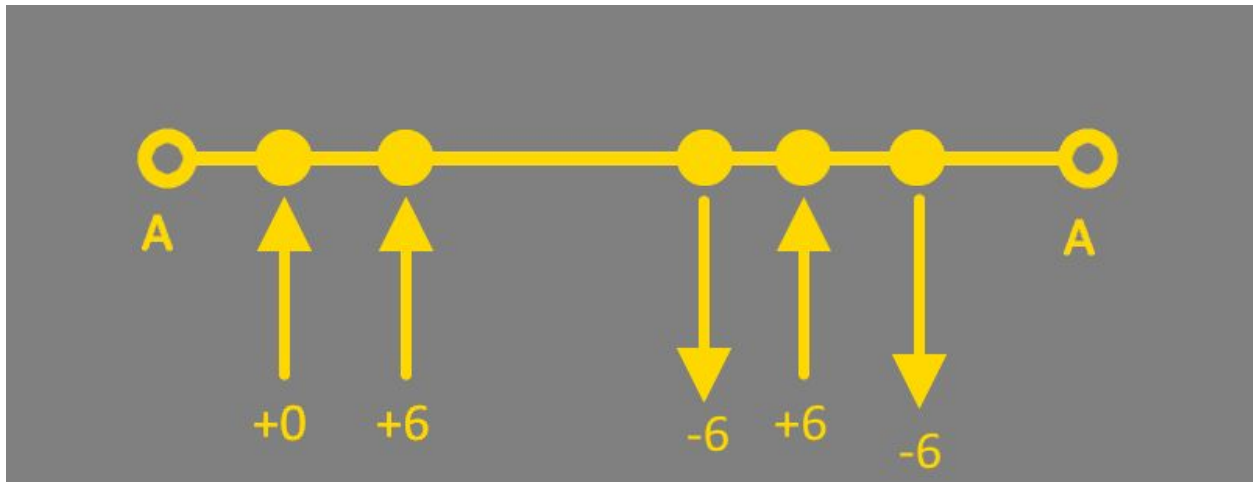
Now that we have explained the input/output behaviour, we can analyze some practical cases where the belt capacity is clear.

We have an iron ingot belt, we have two inputs sequentially and then two factories that take the input. It is most probably that the belt will behave like this.

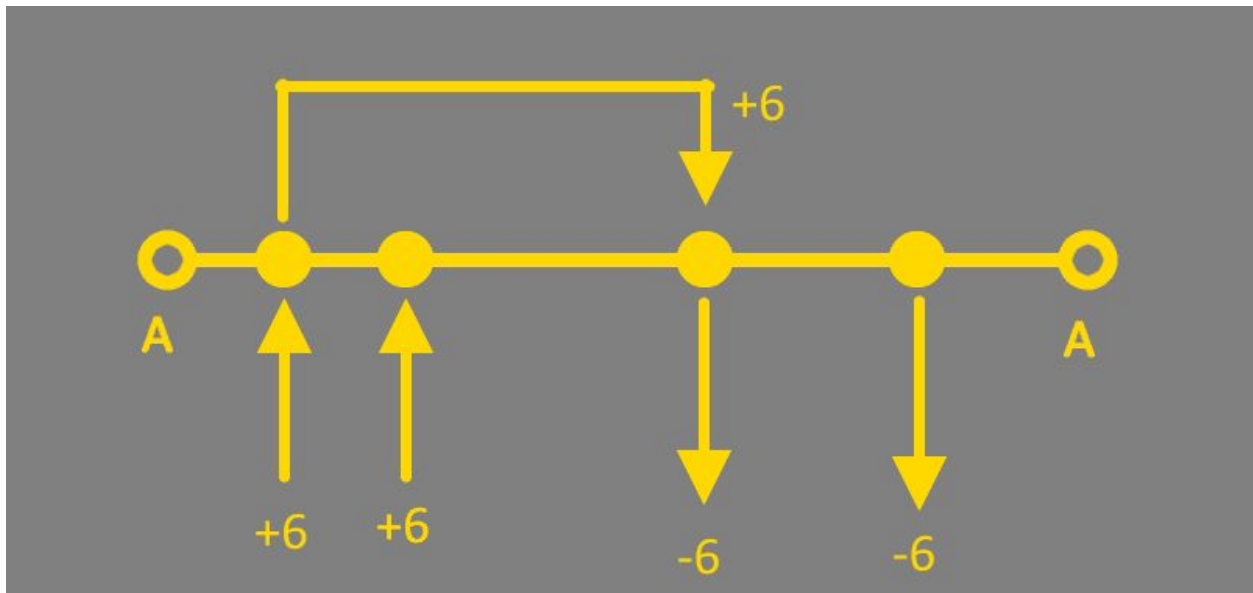


The reason is that we are working with a belt of tier 1 and its top capacity is 6. To solve this we can follow several solutions:

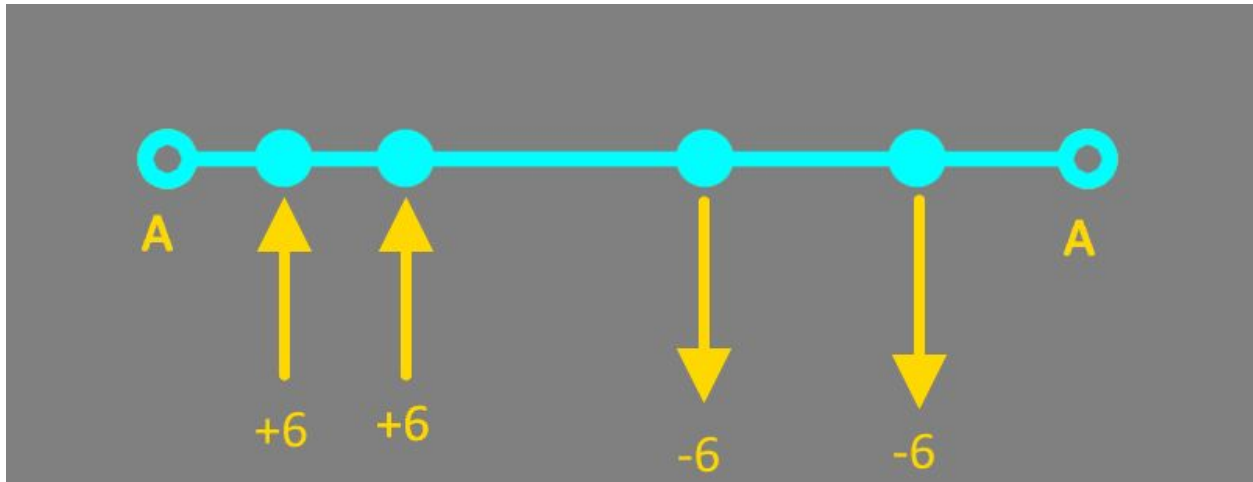
Add a new input between outputs.



Do a bypass



Raise the tier of the belt.



If you don't construct in the polar region, you can use the space to perform the bypass action as it is easier to do there.

Otherwise consider the addition of a new input or the upgrade of the belt. From our experience level 2 is enough to cope with normal case use. Most of the factory will saturate at a given point so the inputs/outputs will gradually balance to ores and science consumption.

### **Depots and external buffers**

With the dynamics you have seen, you can also create buffers at given points to mitigate this behaviour. This is also useful to have places where you can tap to extract resources if needed. The key here is to always prioritize the circular belt as input/output so when full, the excess will go to storage and when empty, the storage will compensate the belt.



Example of iron depot/buffer.