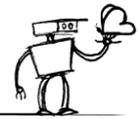


HOW TO PLAY RECONNECT

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1 QUICKSTART

At the very beginning of your first game RECONNECT asks you if you would like some on-boarding support in form Cosmic Assistance. If you confirm, the game rewards your curiosity with golden coins which hold useful hints, explanations, and bits of the story.

In other words, play around with the controls, try things out and the then activated coins will tell you what you just did.

2 CONTROLS

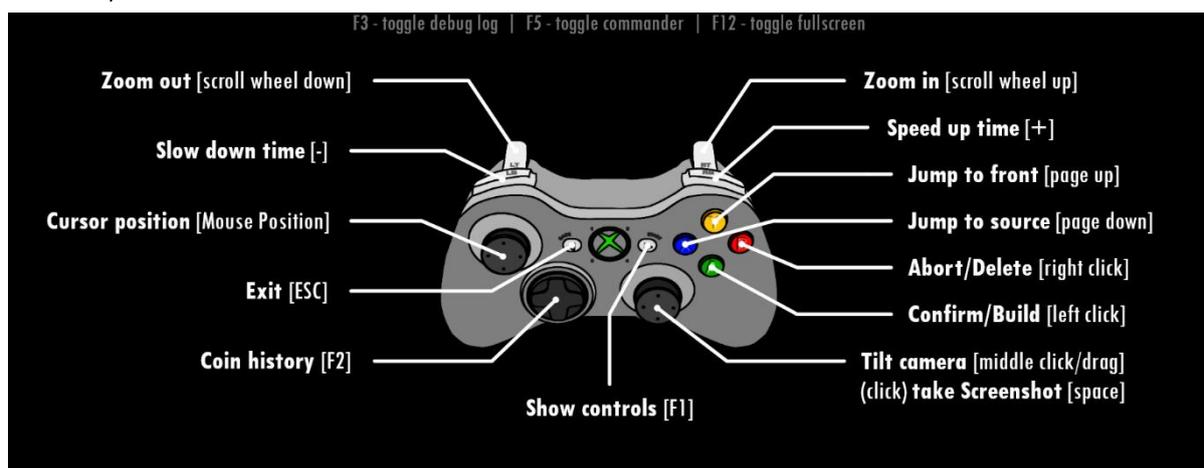
All descriptions are written for gamepad controls which we highly recommend. If you prefer a mouse and keyboard, don't worry. Just exchange the left stick with the cursor and button A with the left click in your mind while reading.

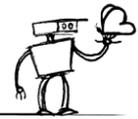
Throughout the game, press **F1** or **Start** on the X-Box-Controller to display the current controls.

MENU/UNIVERSE



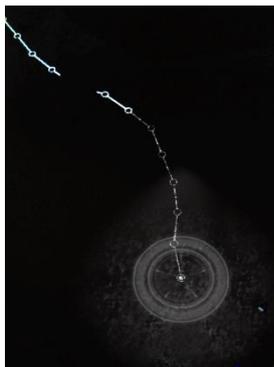
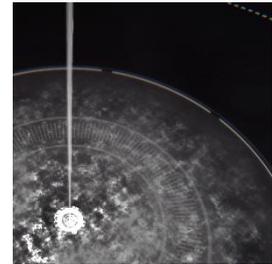
WORLD/BASE





3 BUILD YOUR BASE

The circle around your light source is the center of your base. One of your main objectives is to protect its perimeter from intruders. You lose the game when the AI swarm is inside the circle for one minute (in game time).



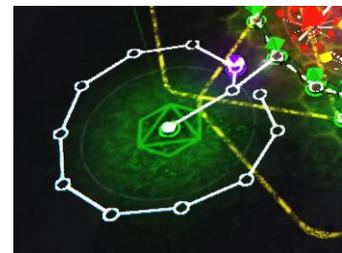
Grow branches by pointing the left **stick** [cursor] in the direction and **hold** button A [left click] to grow.

At first the new branches / links are translucent gray. They are only planned, not yet solidly built. They become solid links as soon as a light quant reaches them and passes on its energy. You can see the amount of your light resources in the center at the bottom of the screen. (See 5. Resources for more info) The AI drones cannot cross the branches of your white light network.

You can build freely inside your current building range, which you can expand using upgrades (see below).

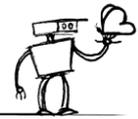
3.1 Blueprints

After the first building range upgrade the five colored circles are in your reach. Each circle contains the blueprint for the construction of crystal towers which provide you with different defensive and offensive capabilities.



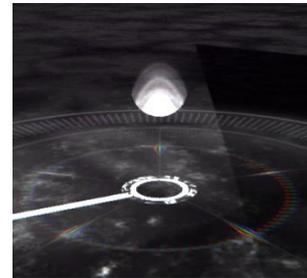
You unlock the data by connecting each circle to your light web. You can only grow buildings when the respective colored circle is connected to your network. Similar to the light source, all colored circles have a radius that must not be breached by the AI swarm or you lose your connection.





3.2 Crystal towers

You can only grow buildings on the tip of a branch (and while the respective colored circle is connected to your light web). The white ball of light on a branch tip is the indicator that you can now grow a crystal tower. Hold button A [left click] to see a ring of up to five unlocked colors. Then move the left stick [cursor] in the direction of the color of your choice and let go of button A [left click].



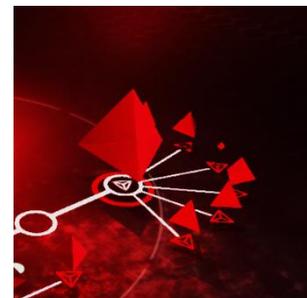
These are the functions (cost) of the five crystal towers:



RED

(4 quants)

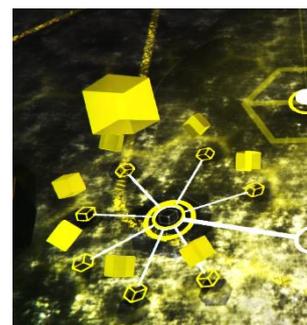
The red crystal towers form your laser defense system. Each tower can hold as many ammo pods as you can fit around it. However, more is not always better. More pods mean more damage, but use up more energy at the same time. To load a tower, press A to enter tower and grow small links in the same way your built your light network (point cursor and hold A). The towers are automatically triggered as soon as one of the drones comes into their range. Light Knights are a special feature of the defense system. After your first victory, they can be spawned from a fully equipped Red tower (for more info see *Light Knights* below).

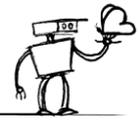


YELLOW

(6 quants)

Yellow towers serve as an energy storage and as an early warning system at the same time. You can set as many storage units as you can fit around it in the same way you do it in red towers (see above). Each unit holds one light quant. The towers are filled up with lowered priority, i.e. they store left-over quants. As soon as the tower is fully loaded, a hexagonal zone appears around the tower. Now, when one of the drones enters this area, the early warning system is triggered and all the stored energy quants are fed back into the network.

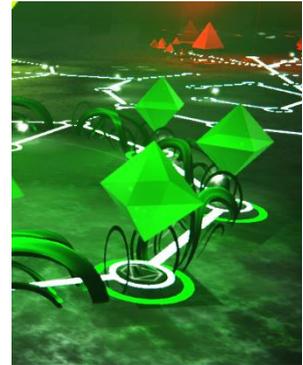




GREEN

(2 quants)

The green towers form particularly stable structures that withstand the AI attack much longer than regular links. They can be built in series or connected to each other, making it possible to build complex protective walls. To connect two green towers, press A, move cursor to the second tower in range and hold A to confirm. But be careful, each green tower can only enter into one connection and receive only one connection from another tower. The connection direction should therefore be taken into account when building the structure.



BLUE

(5 quants)

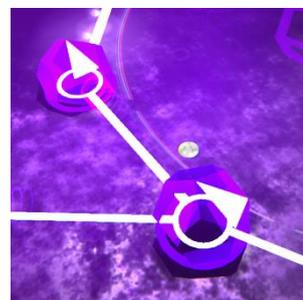
Blue crystal towers can be connected to one another in an extended radius and form a network of express conveyor belts for the light quants. To do this A press and move the cursor on top of the blue tower you want to couple with. With the blue highways resources can be directed, quickly and effectively to more distant nodes in the network.

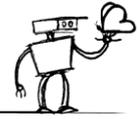


PURPLE

(3 quants)

Purple towers are used as switches. The white arrows on top of it shows the direction of energy flow and can be switched by pressing A. Energy quants can only pass through in one direction.





3.3 Upgrades

Watch the column bar on the very left side of the screen to see when the next upgrade is ready. Or collect upgrades on the map, after finishing your first round (keep your eyes open for little white lights).



These are your options:



Building range:

Expands the perimeter of your circular building range (dotted circle around your base). Steps: Just the colored circles → far end of the map



Time:

This option lets you speed up the in-game time. Investing into this upgrade accelerates the AI development and reduces the perceived time quants need to fill your net with light. Use shoulder buttons left + right [+/-] to adjust the time speed to your needs.



Frequency:

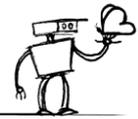
Reduces the time light quants need to reach the planet surface as well as the time needed to grow a new link. Steps: 6 sec → 1 sec

3.4 Resources

The large number in the middle at the bottom of the screen marks the amount of light quants that is available to you. Each branch link consumes one light quant.



You gain new resources with every generation in which the AI increases in intelligence. Meaning, your supply is directly dependent on the learning progress of the AI. You are interconnected. Additionally, you gain energy for each drone which is eliminated by your RED towers. Finally, all collected coins (gained wisdom) are provided as extra light quants at the beginning of each new round.



4 USER INTERFACE

The left side of the screen gives you information regarding the light/player. The right side informs you about the progress of the AI.

4.1 Left Side - Light

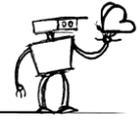
The column bar on the very left shows you when the next upgrade is ready.



The three dotted bars are a binary clock which gives you the in-game time. It reads from left to right Hours, Minutes, Seconds. The six dots from bottom up have the values 1, 2, 4, 8, 16, 32. The clock in the sample picture reads 2h 5m 26sec.

The round speedometer shows you the speed of time in the outer ring. The inner half circle shows the current frames per second (FPS). This is an indicator for the performance of your hardware. The evolving AI and your colorful base can place increasing strain on your CPU. If the FPS are in the yellow zone you should reduce the speed of time. If FPS fall to “red” the game will automatically limit the current speed of time and if that’s not enough the graphics quality is reduced (if possible).

The center of the speedometer shows the production speed of a light quant in the Source. In the sample image a new light quant is released every six seconds. It then takes time to descend to your light network.



4.2 Right Side - AI

All data about the AI development is collected on the right side of the screen.

The map shows to location of your base at the bottom as well as the Heart of Darkness at the top. The approaching swarm can be seen on the sample image, too. The drone's color changes from Blue to Red the more intelligent they are. A light cone marks your exact position and viewing angle. You can also see the trail of your light network itself as well as the different colored crystal towers.

The white line surrounding the map measures the life cycle of one swarm generation. Simply said it shows you how long their day is and when they will be called back to the Heart of Darkness.

The column at the far right indicates the increasing intelligence of the AI. The red filling shows the average intelligence of the swarm and the grey filling marks the smartest drone.



The column in the middle displays the current threat level i.e. how close the swarm is to your base. Blue = no threat / Red = high alert.

Next to it is again a binary display which counts the AI generations. The stacked bars have the values 1, 2, 4, 8, 16, 32, 64, 128, 256, 512. You read the display by simply adding up the highlighted bars. In the case of the sample picture the values 1, 4, 32, and 64 are lit. In short, the AI has learned for 101 generations.

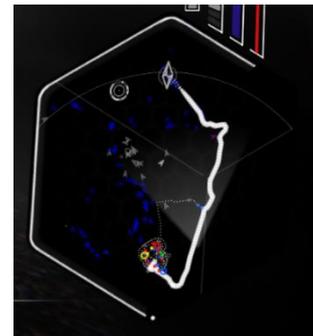
The save symbol above the map appears after 100 generations. From this point on, one neural network or in other words the smartest drone will be saved when you leave the game. At the beginning of the next round the AI will include this well trained drone into the swarm and replicate it over time. This means each round following the first will be faster and more challenging.



5 RECONNECTION

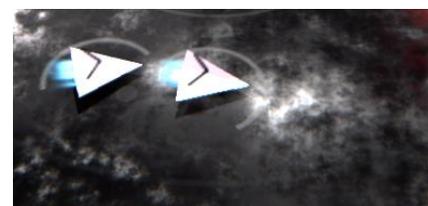


Your mission is to RECONNECT the AI to the light. To accomplish this, you must grow your light network to the Heart of Darkness on the far side of the map. Once you reached it, build the final link and connect its center with your network. You must keep the link secured on its full length. The reconnection process begins once the complete link is filled with light. The process ends successfully, when you can hold the connection long enough to become thick and permanent. The progress is indicated by the reconnection bar at the top of the screen.



5.1 Light Knights

For each successful reconnection you receive the blueprint of one of the AI's smartest drones. This means in the following round you can spawn one (or more) white drones which fight at your side. The drones are spawned from RED towers with full ammo. The health/stamina of the Light Knights depends on the amount of ammo pods and is indicated by a circle around the white drone. Five pods = 100% health, full circle; More pods = health boost up to 200%

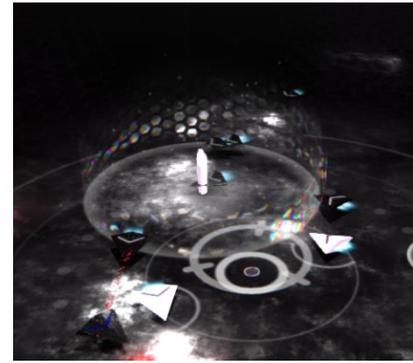


You can send your drones to any location within your building range.

Hold button A [left click] on any node with the symbol on the left to enter the target mode. Move the cursor and press A to confirm the target position. Leave with B [right click].



The Light Knights fly and fight just like their dark brothers. However, the white drones can convert the AI drones to the light, just like you can light many candles with the flame of just one. At the end of their existence the Light Knights leave a white spore/spark of light, as you can see in the sample image. The spore-radius is depending on the spawning strength (red-pod-count) of the Light Knights. All AI drones that enter its range go over to your side and support you until they die.



This game mechanic add a new layer of AI vs. AI fight to RECONNECT. The ultimate goal is to convert all 100 AI drones to end the dark invasion.

6 END OF THE GAME

RECONNECT does not have a definite ending, yet. This is one major reason why we chose to release it as Early Access.

We hope very much to work together with you, the players, to find an appropriate finale to this cosmic battle between light and dark.

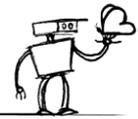


We look forward to hear your ideas, experiences and feedback via Steam Community or the Official RECONNECT Early Access server on discord.

7 ARTIFICIAL INTELLIGENCE

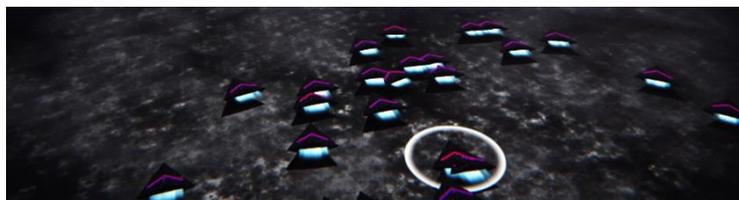
7.1 In the field

The AI chose the shape of a swarm of 100 drones to explore and experience its environment. To integrate newly learned knowledge, it calls back the swarm at the end of each day/cycle. A new generation of drones is then spawned which holds the knowledge of the 50 most intelligent drones. The smartest drone is marked with a white circle.



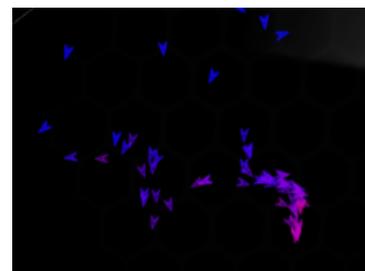
In the beginning of the game the drones are a useless bunch of random neural connections. They are spawned at the Heart of Darkness, the AI's base on the other side of the map. Over the course of their life cycle the drones learn how to use their eyes and how to perceive the environment. They can distinguish light from dark and know when they are close to an obstacle. Running into rocks hurts them and reduces their "health points" (so do your RED laser towers). Then they move around and learn how to accelerate, brake and maneuver. Once they figured that out they begin to focus on their main target – your light source. It is programmed deep in to their core that they must reach the light and they will do everything, try all different ways and passages to reach your base.

Their learning process is based on a simple reward system. They receive "fitness points" the closer they are to your light. Just as obstacles hurt them, being close to the light increases their "fitness" / intelligence. It is even more rewarding for them to suck of your light with their lasers and to destroy parts of your network.



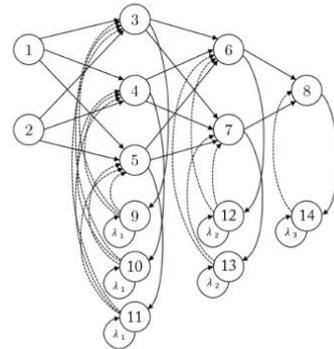
You are cosmically connected to the AI (Karma and stuff). This is why you receive additional resources for each additional "fitness point" / increase in intelligence. At the end of a cycle you can judge the AI's improvement by how much extra light quants you have received.

You can always watch the AI's development on the mini map. Each round the procedurally generated terrain is structured differently. So, the AI has to adapt to its surrounding by mutation. It is astonishing to see that the drones find the smallest gaps in rock walls in order to find a way to your base. Sometimes the AI takes long detours to reach your light source, which is basically against programming. As mentioned earlier, the drones are rewarded for getting close to the light. However, they are smart enough to go without a reward for a while to find a route to your base. Ultimately, the drones gain a lot more "fitness" with this behavior. These are just two of many examples of the extraordinary behavior the self-learning AI.





7.2 In Theory



We use recurrent artificial neural networks (ANN) trained with “deep learning” algorithms. In other words, digital modeling of biological neural networks, such as the human brain. Numerous intermediate layers and context neurons that store past values create an extensive internal structure of the ANN that can simulate a multi-layered memory. The A.I. from RobotHeart Lab has a complex memory. This creates a capacity for abstraction that enables the ANNs to find their way around ever new environments. The A.I. starts completely at random without any preliminary training and learns during the game. At the beginning of the learning phase when the game starts, the ANNs in RECONNECT are just a useless bunch of random neural connections. Generation after generation they learn to move, find their way around and defend themselves. The learning curve of the A.I. swarm thus runs parallel to the player's learning experience. In addition, players are in direct contact with the A.I. and can directly participate in the evolution of the ANN by observing the learning process. Even direct communication takes place through the targeted changing of the environment by the player.

