



7. Mining Engineer Manual

General Overview:

Standing experience.

- In Mining Engineer the user will get to experience the planning phases in the initial detonation phases of building a mine.
- They will get the pilot a drone and take pictures of key locations around proposed site
- They will need to learn about the different types of mine that could be constructed at the site and make an informed selection about which type of mine will be constructed.
- They will need to read hematite concentration charts and make an informed selection about where the excavator driver should dig to acquire the highest concentration of hematite, the primary mineral used for creating iron ore at this location.
- They will need to prepare explosive charges that will be used to help form the mine and then detonate them from a safe distance.

Macros / Shortcut keys:

T = turn teleportation on or off

Wrist Watch: The wrist watch is always on the user's left wrist. When a call is coming in for the user, the icon on the watch will be an orange vibrating phone (Image 1 below). They must place their right hand on top of the watch and a blue circular progress bar will fill up (Image 2 below). Once it is filled, the call will be answered and the watch icon will become a green chat bubble (Image 3 below). When the call is finished, the watch icon will become a yellow question mark (Image 4 below). When the yellow question mark is visible, the user can place their right hand on top of the watch and the narrator will repeat the last set of instructions.

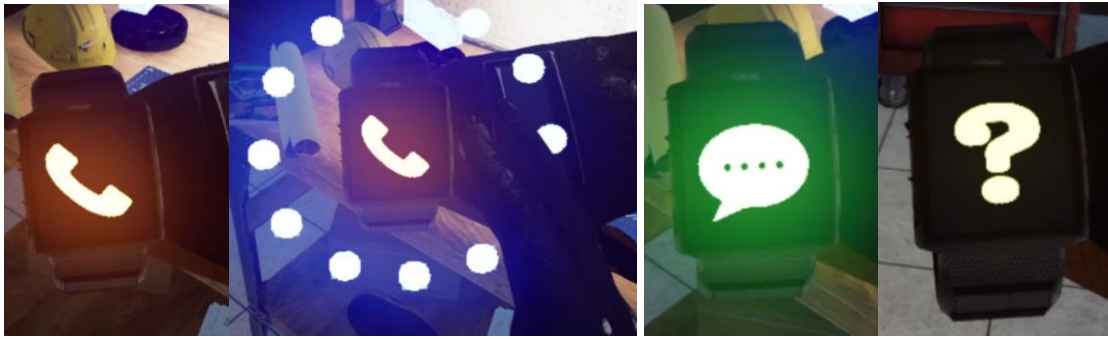


Image 1

Image 2

Image 3

Image 4

Teleportation Map: A map tablet appears during the final area of this simulation when the user must prepare explosive charges. The user can move around the world using the map tablet when it is activated. When your hand is near the tablet, it will automatically point with your index finger which you use to tap the screen. You can tap on the large boxes with numbers inside of them to move to that location. Each location is detailed on the map.



Facilitator Panel: The facilitator panel is an options menu that allows a simulation facilitator to adjust gameplay and accessibility options while a user is inside the experience. To access the facilitator panel during the simulation, press the TAB key.



There are five core options from this menu:

Hint Task: When pressed, the in-game narrator will repeat their most recent instruction, which is helpful if the user misses something or is distracted while in the simulation.

Print Screen: This button will save a screenshot of the current view that the user sees.

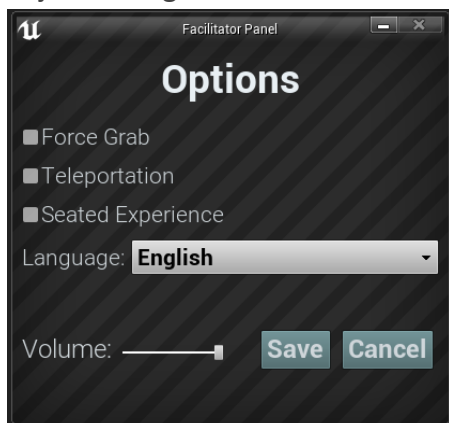
Settings: This will bring the facilitator into a separate menu screen where they have multiple options to change the experience. This is detailed below.

Restart: This will restart the simulation from the very beginning.

Quit: This will exit the experience.

Greyed out buttons: Finish Task & Restart Task - These functions are not currently working but will be implemented in the near future.

Settings: The gameplay settings have an additional set of toggles and sliders the facilitator can adjust during the simulation.



Force Grab: If someone is unable to reach something or is running the experience while seated, this option allows the user to grab objects without being directly next to them. The user can point their hands at objects that are far away and pulling the trigger will bring the object into their hand, grabbing it

Teleportation: This will turn on the granular teleportation around the game world. To use teleportation 1) hold down the center thumbpad button (Vive Pro) or push forward on the thumb joystick (Oculus Rift S) to create a blue teleportation arc 2) select a location to go by moving the controller until the blue circle at the end of the arc is in the desired location (A red line means that locations is not valid or blocked) and 3) release the center thumbpad button (Vive and Vive Pro) or thumb joystick (Oculus Rift S) which will cause the screen will quickly fade to black and when it fades back in, the user will be in a new location.

Seated Experience: When turned on, this option will move the user's location in the game world to be higher up, so that if they are sitting down, their view will be similar to a standing position.

Language: This drop-down menu will allow the facilitator to change the language of the experience. When changing language, the simulation will need to restart.

Volume: This slider will adjust the master volume of the game. If the sliding bar is on the right side, the volume will be at 100% and on the left side, the volume will be set to 0%.

Full written walkthrough:

Quest	Task	Description
1	A	Answer watch, hold right hand above the watch icon on left hand
1	B	Listen to introduction about the career
1	C	Initiate take off of the drone by pressing the Start button on the controller screen
1	D	Grab the two handles of the controller
1	E	Release your hands from the controller by pulling them away from the controller.
1	F	Practice moving the drone using the joystick or thumbpad on the left joystick. Press the button to the left of the controller to continue.
1	G	Practice looking around with the drone using the joystick or thumbpad on the right joystick. Press the button to the right of the controller to continue.
1	H	Take a photo of the drone by pulling on either the left or the right trigger of the controller
1	I	Press the Home button on the drone screen to return the drone to it's starting position
1	J	Listen to the narrator explain some final notes about the career.
2	A	Listen to the narrator explain the task for the day.
2	B	Take a photo of the town which is in the north west part of the map. Make sure the camera of the drone is centered on the town.
2	C	Listen to the narrator talk about the town.
2	D	Take a photo of the river which is in the east part of the map. Make sure the camera of the drone is centered on the river.
2	E	Listen to the narrator talk about the river.
2	F	Take a photo of a forest which is in the south part of the map. Make sure the camera of the drone is centered on the forest.
2	G	Listen to the narrator talk about the forest.
2	H	Take a photo of a mountain which is in the north east part of the map. Make sure the camera of the drone is centered on the mountain.
2	I	Listen to the narrator talk about the mountain.
2	J	Fly the drone into the landing area, which is near the trailer and has a large blue indicator area on the map.

2	K	Listen to the narrator discuss the final notes about this job.
3	A	Answer watch, hold right hand above the watch icon on left hand
3	B	Listen to the narrator explain the task for the day.
3	C	Select the right mine type of the mine for this site using the blueprint. The correct answer is open pit mine
3	D	Listen to the narrator's final notes about the mine construction
3	E	Wait for the next level to load
4a	A	Answer watch, hold right hand above the watch icon on left hand
4a	B	Listen to the narrator explain how the ore polygon map works
4	A	Select the three highest concentration zones on the map. These are D7, D10 and D13.
4	B	Listen to the narrator explain explosives
4	C	Teleport to area one using the map tablet
4	D	Listen to the narrator explain what the tools are at this location
4	E	Pickup the detonator cord on the ground
4	F	Grab an explosive charge from the box
4	G	Attach the detonator cord to the explosive charge
4	H	Place the explosive into the hole
4	I	Teleport to area two using the map tablet
4	J	Complete the same process: Grab the detonator cord and an explosive charge, insert the cord into the charge then place it in the hole
4	K	Return to the home location using the map
4	L	Grab the walkie-talkie from the desk and press the "Call" button
4	M	Listen to the narrator explain clearing the pit
4	N	Enter the code into the briefcase (3-6-0) and then press the button to detonate the explosives.
4	O	Listen to the narrator

Map

Location 1 - The Trailer: The trailer in mining engineer is where the user will spend most of their time. The simulation begins inside the trailer, and the user will be taught how to Pilot the Drone and will be tasked with taking some photos of the area outside (**Trailer 1A**). During the 2nd part of the simulation, the user will be brought back to the trailer at night where they will have to make a decision about what type of mine will be constructed (**Trailer 1B**). The user will be brought back to the trailer for the 3rd and final section of the simulation, where they will first need to select the highest density of hematite on an ore polygon map and then move down to the mine floor (**Trailer 1C**).

Trailer 1A



Trailer 1B



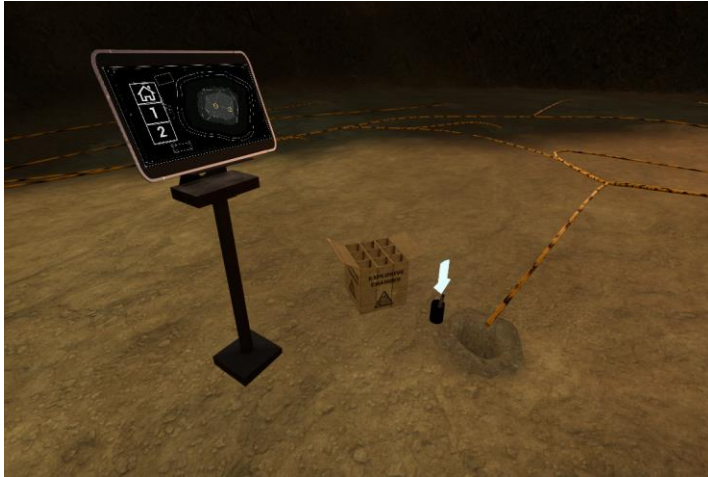
Trailer 1C



Location 2 - Outside the Trailer: The area outside of the trailer is where the user will have to take photographs using the drone. There are four main areas that the user will need to get a picture of. The first is the town, which is in the Northwest section of the area, as indicated on the map behind the drone controller. When they are tasked with taking a photo of the town, a yellow indicator will appear on the map which can help them navigate to the town. When they arrive at the town, they need to make sure the town is in the centre of the screen of the drone controller when they take the picture. The second area they need to visit is the river to the east. A blue icon will appear on the map behind the drone controller to guide them. Again, to get the correct photo, the river needs to be in the centre of the screen of the drone controller. The Third location is the forest to the South, which will appear on the map as a green icon. The 4th location is a mountain to the Northeast, which will appear on the map as a purple icon. Once all four photos have been taken, a landing area will appear in the centre of the map.



Location 3 - Mine Floor: The floor of the mine is where the user will come in the final part of the simulation, where they must prepare the explosive charges and place them into the prairie dog holes.



Location 4 - Overview tower: The overview tower is the final section the user will experience in the third part of the simulation. At this location the user must input the correct code to open up a Detonator briefcase, which they will then use to blow up the explosive charges placed earlier.



Key Objects

Note: Some objects will not be visible at the beginning of the tutorial and will only appear when they are required.

Drone controller: The drone controller allows the user to move around the area and take photographs of specific locations. To pilot the drone, the user must grab onto both handles of the controller. Once the user grabs onto the controller, they can release the trigger buttons and the virtual hands will hold on. When both hands are grabbing the drone, they can move the drone forward and backward, left and right by using the left joystick (Oculus) or touchpad (Vive). To turn the drone and look around, use the right joystick (Oculus) or touchpad (Vive). To take a picture with the drone, the user can pull either the left or the right VR trigger. If the user wishes to release their grip from the drone controller, they must pull their hands away from it and they will snap off of the controller. To reset the location of the drone in the world (eg. if the user gets lost) there is a home button on the screen that can be tapped. There are boundaries to the area that the drone can fly, if the user tries to fly outside of this area, the drone controller screen will flicker and the narrator will explain that they are flying too far from the trailer.



Drone camera: When a photo is taken, the picture will be sent to the screen behind the drone controller. If the picture was correct, a green check mark will appear and the photo will remain on the screen (Image 1 below). If the picture was incorrect, a red X will appear on the photo and then the photo will be removed (Image 2 below). If a duplicate shot is taken, a blue icon will appear and then the photo will be removed (Image 3 below).



Image 1

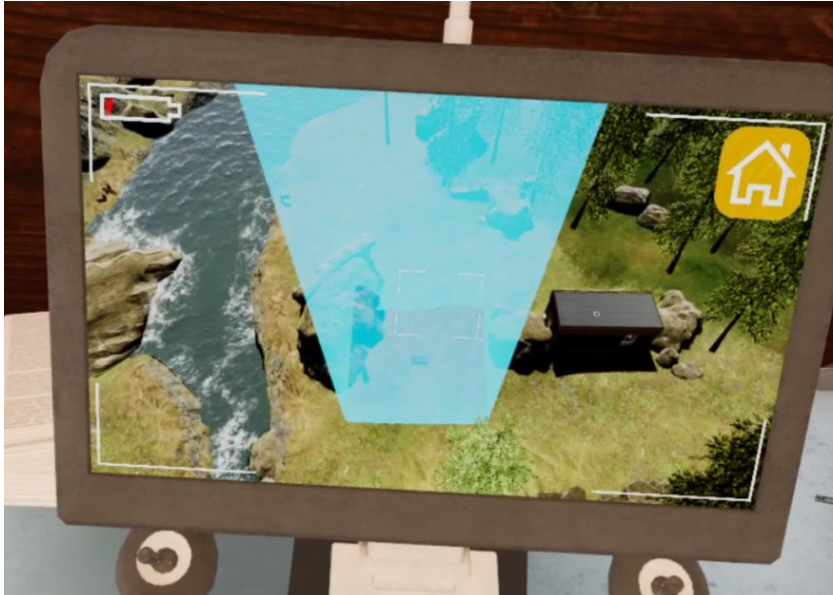
Image 2

Image 3

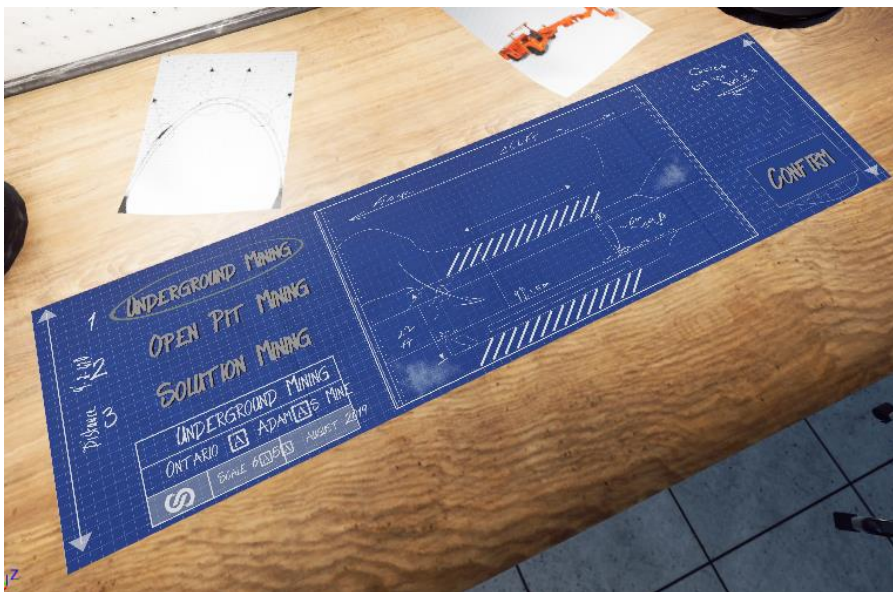
Trailer 1A Map: There is a large map behind the drone controller that displays where the key locations are located and where the drone is located. There are 6 different icons on the map: The yellow arrow head is the user's drones location with the drone facing in the direction of the arrow. The yellow town icon is the general location of the town, the blue river icon is the general location of the river, the green forest icon is the general location of the forest, the purple mountain is the general location of the mountain and the teal flag is the general location of the landing area. As the tutorial progresses, the picture the user needs to take will pulse on the map.



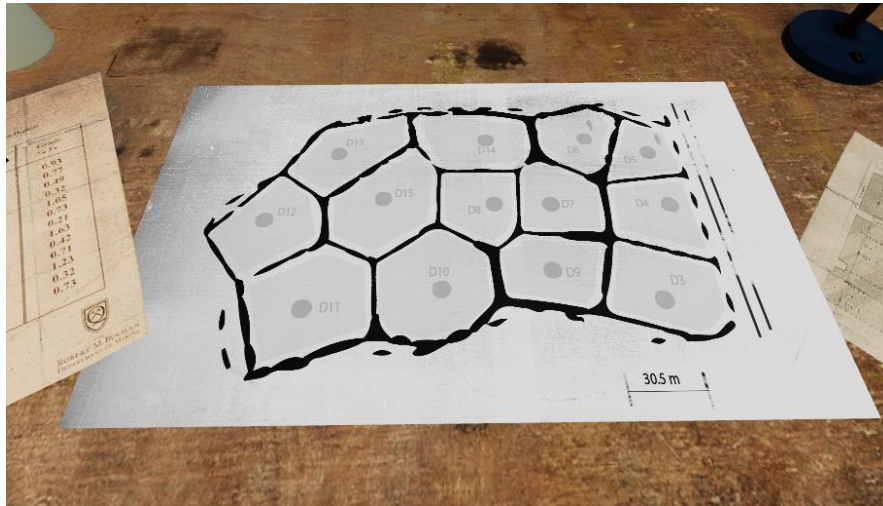
Landing Zone: The landing zone will appear after all four photos have been taken by the drone. To land the drone, the user must fly directly into the blue pillar of light and the drone's autopilot function will take control and land the drone successfully on the ground below.



Mine Selection: When the user returns to the trailer for the second part of the simulation, they will need to help choose which type of mine will be built at this site. There is a large blueprint on the desk in this trailer and the user can select from the three different options on the left side. When they select a type of mine, the narrator will explain a bit about that type of mine. Then, after the user hears about the three types of mine, they must select the confirm button on the right. The correct type of mine is the open pit mine. Then the user selects open pit mine and then presses the confirm button, the simulation will progress.



Ore Polygon Map: The ore polygon map is located inside the trailer during the 3rd section of the simulation. The user will have to read over the chart of the different areas (named D-1 through D-13) and then select the three areas with the highest concentrations by tapping on those areas on the main map. These areas are D-7, D-10 and D-13. If the user selects these three areas, and no other areas are selected, then the simulation will progress.



Explosive Charges: The explosive charges are located on the floor of the mine in the final section of the simulation. There are two parts to the explosives, the charge itself and the detonator cord. To place the explosives, the user must grab one charge from the box labeled explosives and the detonator pin from the can next to the hole. Then, the user must place the pin into the top of the explosive charge and they will snap together. Then, the user can place the explosive charge into the hole. If the user drops the detonator pin or an explosive charge outside of the play area, the pin will snap back to the cup and a new explosive charge will be spawned.



Walkie-Talkie: The walkie-talkie is in the trailer of the third part of the simulation. The narrator will describe how to use it and after she has finished her description, the walkie-talkie will appear on the table with the or polygon map. The user must pick up the walkie-talkie and with the other hand press the large yellow report button on the side of the walkie-talkie. Once the button has been pressed, the narrator will continue the tutorial and then the user will be teleported to the overview tower.



Detonator Briefcase: The detonation briefcase is located in the overview tower of the third part of the simulation. The narrator will describe how to use the detonation briefcase and then the keypad will appear on the top after she has finished talking. The user will need to input 3-6-0 to open the briefcase. Once it is open, the user can press the large red button and it will blow up the explosive charges. You can see a nice view of the explosion from the tower.



Freeplay vs. Tutorial:

In the tutorial, the narrator will first walk the user through how to pilot the drone, then they will be tasked with taking pictures of different areas around the trailer. These will be the town, the river, the forest, in the mountains. Once they have successfully taken the four photos, they will be tasked with flying the drone to the landing area which will appear as a large blue glowing area. the Drone will automatically land and the first section of the simulation will end. After a brief loading screen, the user will be brought back to the same trailer but at night. During the section they will need to make us election about what kind of mine will be made. After this, another loading screen will take them into the third section of the simulation. The user will have to select the three highest concentrations of hematite on an ore polygon map, place explosive charges, and then detonate those charges from a tower.

In freeplay, the first section where the user is taught how to pilot the drone is skipped and their first task will be taking photos of the different areas. The rest of the simulation will play out in the same manner as the tutorial.