



9. Pipe Fitter Manual

General Overview:

Standing experience.

- Pipefitter is an experience where the user will work on measuring and cutting large water pipes and help with the installation process.
- The user will work in an outdoor environment at a construction site for a new hydro electric dam.
- The user must read and interpret blueprints to successfully cut down the piece.
- They must maintain regular communication with other people on site, like the excavator driver.

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

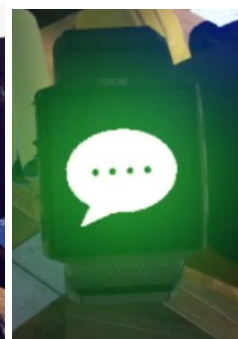


Image 3

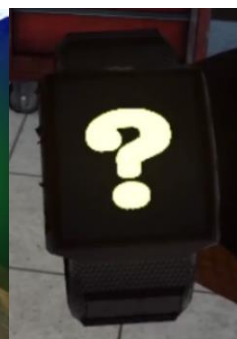


Image 4

Teleportation Map: A map tablet is at every location in the simulation. 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 in 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.

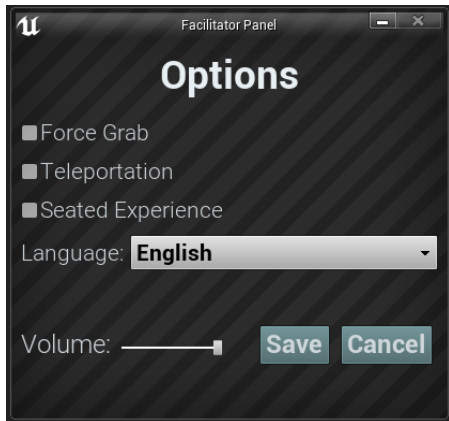
Settings: This will bring the facilitator into a separate menu screen where they have multiple options to change the experience. This is detailed below.

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	call	Answer your watch by holding your right hand above the watch icon on your left wrist
1	info	Listen to introduction about the career
1	blueprint	Listen to information about the pipe fitter blueprint

1	measureGrab	Grab the tape measure from the work bench, which will be highlighted
1	markerGrab	Grab the chalk from the work bench
1	markInfo	Listen to information about how to use the tape measure and chalk
1	markComp	Put the tape measure on the edge of the pipe and pull it across the highlighted area. Using the chalk in your other hand, add a tick on the pipe at the 45 centimeter mark
1	infoWrap	Listen to information about how to wrap the pipe
1	wrapGrab	Grab the pipe wrapping from the work bench
1	wrapComp	Place the pipe wrapping on the highlighted area wrap pipe all the way around. You can grab the pipe with your other hand and rotate it by pulling the pipe up or down
1	infoCut	Listen to information about how to cut the pipe and the face shield
1	faceWorn	Grab the face shield from the work bench and place it on your head
1	grinderGrab	Grab the grinder from the work bench
1	cutComp	Cut the pipe along the outside edge, to the left of the wrapped section by bringing the spinning blade of the grinder into contact with the pipe. Grab the pipe with your other hand to rotate it
1	infoFlange	Listen to information about attaching the pipe flange
1	flangeGrab	Grab the large pipe flange next to the pipe
1	flangeComp	Attach the flange to the pipe by placing it on the pipe where you just cut
1	outro	Final information about first pipe
2	infoPipe	Listen to information about the next pipe. This pipe has two cuts instead of one and will require a larger butterfly valve flange
2	cutComp	Measure and mark the second pipe, left side is 15 centimeters and the right side is 20 centimeters. Wrap each side after marking them and then cut that part off. Attach a normal flange to the left side and a butterfly valve to the right side.
2	outro	Listen to the narrator
2	faceOff	Remove the face shield by grabbing behind your head and pull it off
2	teleport2	Teleport to Location 2 using the map tablet.
3	info	Listen to information about using the ratchet straps
3	hatWorn	Grab the helmet from the work table and place it on your head
3	strapGrab	Grab the ratchet strap from the ground underneath the pipe
3	strapAttach	Attach it to the ratchet device on the pipe

3	RatchetComp	Crank the ratchet to tighten the strap around the pipe. Grab the ratchet handle and crank it upwards a few times until the strap is tightly secured around the pipe. Do this for both ratchet straps
3	teleport3	Teleport to Location 3 using the map tablet.
4	info	Listen to information about getting the pipes into the trench
4	walkie1	Let the excavator driver know to bring the pipe over by pressing the button on the walkie-talkie.
4	waitPipe1	Wait for pipe to be moved to trench
4	infoHand	Listen to information about using hand motions.
4	pipeGood1	Guide the driver to the left with your right hand, following the hologram hand's motion. With your right hand, face your palm to the left and move it from the right to the left.
4	walkie2	Let the excavator driver know it's clear to lower the pipe by pressing the button on the walkie-talkie.
4	strapRelease1	Grab the handle of the ratchet strap to remove it from the pipe. Remove both ratchet straps
4	infoDrill	Listen to information about how to use the impact driver to secure the pipe flanges
4	drillPipe1	Grab the impact driver from the table then tighten the three indicated bolts, when they are secured a burst of confetti will appear.
4	infoValve	Listen to information about the butterfly valve
4	valveClose	Grab the butterfly valve hand wheel and rotate it clockwise
4	walkie3	Let the excavator driver know to go back to grab the second pipe by pressing the button on the walkie-talkie.
4	waitReturn1	Wait for the excavator to move back
4	teleport2	Teleport to Location 2 using the map tablet.
5	ratchetComp	Crank the ratchet to tighten the strap around the pipe. Grab the ratchet handle and crank it upwards a few times until the strap is tightly secured around the pipe. Do this for both ratchet straps
5	teleport3	Teleport to Location 3 using the map tablet.
5	walkie1	Let the excavator driver know to bring the pipe over by pressing the button on the walkie-talkie.
5	waitPipe2	Wait for pipe to be moved to trench

5	pipeGood2	Guide the driver to the right with your left hand, following the hologram hand's motion. With your left hand, face your palm to the left and move it from the left to the right.
5	walkie2	Let the excavator driver know it's clear to lower the pipe by pressing the button on the walkie-talkie.
5	releaseStrap2	Grab the handle of the ratchet strap to remove it from the pipe. Remove both ratchet straps
5	drillPipe2	Grab the impact driver from the table. Tighten the six indicated bolts, when they are secured a burst of confetti will appear.
5	walkie3	When you're ready to finish the tutorial, press the button on the walkie-talkie
5	outro	Listen to final information about the career

Map

The user will be working alongside a river where they set up and prepare pipes to be installed into a large trench running perpendicular to the river.



Location 1 - Cutting Pipes: This is the location where the user will start in the experience. At this location, they will have access to their main blueprint, a tape measure and chalk, pipe wrapping, a grinding mask, and a grinder. They will be able to measure and mark how much of the pipe will need to be removed, wrap the pipe with the pipe wrapping, and then cut the pipe down to the required size based on the blueprint.



Location 2 - Securing Pipes: This is the second location that the user will experience in the simulation. At this location, they will need to equip a safety helmet, and then secure a pipe to an excavator using ratchet straps. They will visit this location twice in the simulation, as they must install two pipes into the trench.



Location 3 - Installing Pipes: This is the third location that the user will experience in the simulation. They will have access to a walkie-talkie which they can use to communicate with the excavator driver, an impact driver which they can use to secure the pipes in the trench, and they'll have to direct the excavator driver using hand motions. They will visit this location twice in the simulation, as they must install two pipes into the trench.



Key Objects

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

Pipes: There are pipes located at all locations in the simulation. The pipes at the first location will need to be measured, wrapped, then cut down using a grinder. After they are cut down, flanges must be attached to the side that has been cut. The first pipe that the user cuts will only have one side cut down and then they must attach one flange. The second pipe will have both sides cut down and therefore have two flanges attached. The user can rotate the pipes on a pipe rotation device by grabbing the pipe anywhere and rotating it up or down allowing the user to access all sides of the pipe. The user will continue to work on these pipes at the second and third locations, when they must attach them to an excavator to have them moved into a trench, and then secure them into the trench using an impact driver.



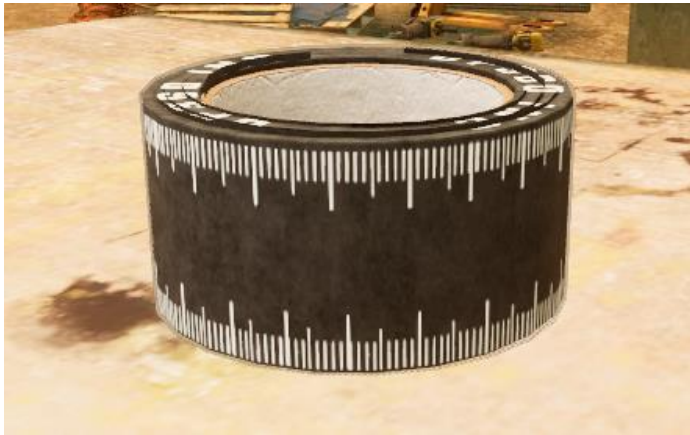
Tape Measure: The tape measure is located on the table at Location 1. The user will need to pick up the tape measure, and measure the amount of pipe that will be removed. To use the tape measure, the user must hook it onto one end of the pipe, at the indicated location then they can pull the tape measure across the pipe. If the user pulls the tape measure away from the pipe and not along it, the tape measure will snap off of the pipe. There are indications arrows that run along the centerline of the pipe which is where the user can use the tape measure.



Chalk: The chalk is located on the table at Location 1. The user will need to pick up the chalk, and can mark on the pipe different locations that they will then use to cut. To successfully determine where to cut, use the tape measure to find the required distances, then tap on the pipe at the location with the chalk and a small tick will be added that will go around the pipe. After the chalk has gone all the way around, it will change color. Green means the chalk was marked at the right location and a red line means that it was marked at the wrong location.



Pipe Wrapping: The pipe wrapping is located on the table at Location 1. Once the user has successfully marked where they will need to cut the pipe, an arrow indicator will surround the pipe at that location. The user can bring the pipe wrapping into contact with the indicated location, and roll it either up or down wrapping the pipe. They can grab onto the pipe and rotate it to be able to wrap all the way around. They must get to 100% wrapping, however there is some wiggle room with how accurate they must be. If they miss a few spots around the pipe, they can still complete this section without being perfect.



Pipe Rotation Device: The pipe rotation device is located underneath the pipe in Location 1. This device allows the user to grab onto the pipe and spin it either up or down, rotating the pipe on the wheels. This allows the user to get all the way around the pipe, which is useful when wrapping or cutting the pipe. They can grab anywhere on the pipe and then move it up or down to spin it.



Grinder: The grinder is located on the table at Location 1. When picked up, the grinder will automatically turn on and when brought into contact with the pipe at the right location, it will cut into the pipe. The correct location will always be on the outside edge of the tape, as indicated by the arrows. The user can grab onto the pipe and rotate it, allowing the user to be able to cut all the way around. The user needs to reach 100% before the pipe section will fall off. There is some wiggle room with how much of the pipe they need to cut, in case they miss a few spots.



Face Shield: The face shield is located on the table at Location 1. The user can pick it up and place it on their head, and all snap into the correct position. The user can grab the front visor of the face shield, and pull it down to protect their face or pull it up and out of the way. Once the user has completed cutting the pipe, the narrator will explain that they can remove the shield. To remove the face shield, the user must grab the back of their head, and then they can pull the face shield off.



Pipe Flanges: The pipe flanges are located on either side of the pipe at Location 1. The pipe flanges are used to secure one pipe to another, and must be attached to the pipe after the user has finished cutting it. There are two different types of pipe flanges, on the left side of the pipe is a normal flange that is red. The user will have to attach this type of flange to the first and second pipe. On the right side of the pipe, is a double sided flange with a butterfly valve that the user has to install to the second pipe.



Hardhat: The hard hat is located on a table at Location 2. The user can pick it up and place it on their head and it snaps to the right position. The hard hat will remain on the user's head for the remainder of the simulation, as it is dangerous to work around large machinery without their proper safety equipment.



Ratchet Strap: The ratchet straps are located on the pipe at location 2 and will eventually be brought to Location 3. To use the ratchet strap, the user has to grab onto the handle and crank the ratchet device up and down. They will hear clicking and see the strap hanging underneath the pipe gets tighter. Once the strap is snug on the pipe, the user will need to lock the ratchet strap into the locked position, which is at the uppermost extreme. Once they reach this, a confetti effect will play letting the user know that they have completed ratcheting the strap onto the pipe. They will have to do this twice, and then the narrator will instruct them to move over to the next location. At Location 3, the ratchet straps need to be removed from the pipe, this is done by grabbing onto the handle of the ratchet strap and they will automatically release.



Butterfly Valve: The butterfly valve is located on the first pipe the user must install at Location 3. The butterfly valve can stop or allow water flow through this section of pipe. The user must close the butterfly valve, by rotating a hand wheel located on the top of the butterfly valve. To rotate it they must grab onto the handle and rotate clockwise, and they will see the butterfly valve on the right side of the pipe close.



Impact Driver: The impact driver is located on a table at Location 3. It is used to secure the pipe flanges together, once the pipe has been lowered into the trench. The impact driver automatically turns on when the tip of the impact driver comes into contact with a screw. The driver will start spinning and secure that screw onto the flange, when it is finished a small yellow burst of confetti will appear. The user will have to do this three times on the first pipe and then six times on the second pipe.



Hand Motions: Hand motions are used to direct the excavator driver to move the pipe to the left or to the right at Location 3. To successfully instruct the excavator driver, the user must make large smooth motions across their chest with either the left or the right hand. With your VR hands palm facing in a certain direction move it to either the left to make an excavator drive to the left or to the right to make the excavator driver move to the right. There is a large arrow that will appear underneath the pipe and a hologram version of the player's hands to help guide them and how to make this motion.



Freeplay vs. Tutorial:

Free play and the tutorial in the simulation are the same as it is a very linear guided experience.