



13. Manual Machinist Manual

General Overview:

Standing experience.

- The manual machinist simulation will take users through the process of working on a large manual lathe and manual milling machine.
- The user will be tasked with reading and interpreting design drafts that display what the user will need to do.
- The user will need to clean, set up and make two different types of cuts using a lathe machine by rotating and moving the cutting tool around using multiple hand wheels.
- The user will also need to clean, set up and drill 4 holes using a manual milling machine by adjusting its location on the pallet of this machine using cranks and levers.

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

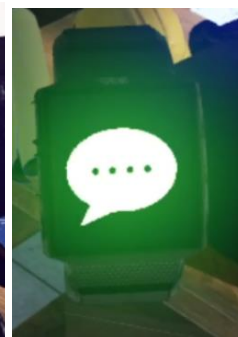


Image 3

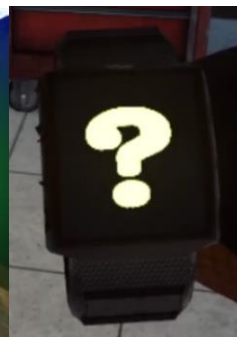


Image 4

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.

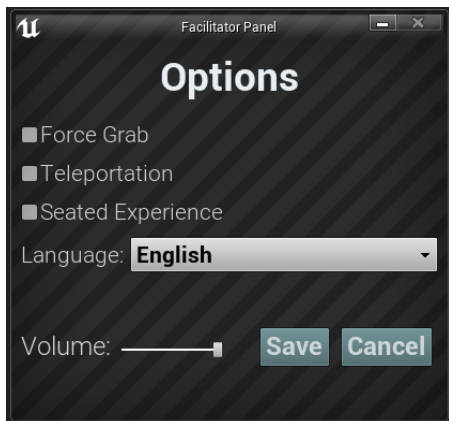
Settings: This will bring the facilitator into a separate menu screen where they have multiple options to change the experience. This is detailed below.

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 location 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	infoBP	Listen to the narrator go over general information about machinists
1	grabBP	Pick up and check the overview design draft for the task for the day
1	hangBP	Hang the design draft on the hanger by the lathe machine
1	infoDD1	Listen to the narrator go over information about the design drafts
1	infoDD2	Grab the first page of the design draft
1	grabDD	Listen to the narrator go over the design drafts
1	grabAir	Grab the air gun from the lathe machine
1	airGunOn	Turn on airgun by pressing the red button on the back of it
1	useAir1	Clear off the lathe machine by aiming the airgun at the carriage where the debris is resting
1	infoChuck	Listen to the narrator go over information about how the chuck key works
1	grabChuck	Grab the chuck key from the workbench

1	placeChuck	Place the chuck key into the chuck socket on the lathe machine
1	grabStock	Pickup the stock from the workbench
1	infoMarker	Listen to the narrator go over information about the markings on the stock
1	placeStock	Place the stock into the chuck
1	removeChuck	Remove the chuck key from the lathe machine, which will secure the stock in the chuck
1	infoTool1	Listen to the narrator go over information about the required cutting tool for the lathe machine
1	grabTool1	Grab the cutting tool for the lathe from the workbench
1	placeTool1	Insert the cutting tool into the tool post
1	secureTool	Secure the tool to the tool post by pulling the tool post lever towards the user
2	infoCranks	Listen to the narrator go over information about the different cranks that the lathe machine uses.
2	testCrank	Try moving the lathe machine carriage around using both the carriage wheel and cross-feed wheel cranks
2	crank1	Move the tool into position using both the carriage and cross-feed wheels
2	infoPower	Listen to the narrator go over how to turn on the chuck
2	spindleOn	Power up the chuck using the power lever starting the spinning by pulling the power level down
2	infoCut1	Listen to the narrator explain information about how to complete the first cut
2	cut1	Carefully make the first cut around the edge of the stock by moving the cutting tool into contact with the stock using the carriage wheel crank
2	spindleOff	Turn off the spindle by pulling the power lever up
2	useAir2	Clean off the machine of debris from the cut using the airgun
2	outroCut	Listen to the narrator explain some final notes about the first cut
3	infoCut2	Listen to the narrator explain the second cut
3	grabTool2	Grab the quill tool for the tailstock from the workbench
3	placeTool2	Place the tool into the tailstock
3	moveCross	Move the cross-feed carriage out of the way toward the player
3	moveCarriage1	Move the carriage back toward the tailstock using the carriage wheel crank
3	secureTail	Secure the tailstock to the carriage using the tailstock lever by rotating it to the left

3	moveCarriage2	Bring the carriage back near the spindle and get it into position for the second cut.
3	spindleOn	Power up the chuck using the power lever starting the spinning by pulling the power level down
3	infoCut3	Listen to the narrator explain how to complete the second cut
3	cut2	Complete the second cut by moving the drilling tool into contact with the stock by rotating the crank on the right of the tailstock.
3	spindleOff	Move the tailstock back and turn off the spindle
3	useAir3	Clean off the machine of debris using the airgun
3	stockRemove	Remove the stock from the lathe machine by using the chuck key.
3	outroCut2	Listen to the narrator explain some final notes about the second cut
4	move2	Use the button on the workbench to move to location 2 to move to the manual milling machine
4	infoMill	Listen to the narrator explain how to use the milling machine
4	useAir4	Clear off the table of the milling machine using the airgun
4	grabDrill	Grab the drill bit from the workbench and insert it into the quill of the milling machine.
4	infoVise	Listen to the narrator explain the vise
4	visePlace	Grab the stock from earlier and place the stock into the vise of the milling machine
4	grabHandle	Grab the vise handle
4	viseSecure	Secure the stock in the vise using the vise handle
4	removeHandle	Remove the vise handle
5	infoCranks	Listen to the narrator explain all the cranks on the milling machine
5	crank1	Move the pallet of the milling machine up and down using the vertical knee traverse crank
5	crank2	Move the pallet of the milling machine forward and backward using the saddle traverse crank
5	crank3	Move the pallet of the milling machine left and right using the table traverse crank handle
5	millPos1	Get the stock into the correct position for drill hole number 1
5	infoCut	Listen to the narrator explain how to drill using the milling machine
5	millOn	Turn on the drill using the lever on the top left part of the milling machine
5	leverInfo	Listen to the narrator explain more information about drilling

5	leverGrab	Grab the lever of the milling machine and perform the first drill
5	drill1	Complete two more drilling motions to punch all the way through the stock
5	millPos2	Get the stock into the correct position for drill hole number 2
5	drill2	Grab the lever of the milling machine and perform the drilling motions to punch through the stock
5	drill34	Move the stock into the correct position and drill the 3rd and 4th holes
5	turnOff	Turn off the milling machine
5	useAir5	Use the airgun to clear away all the debris
5	viseUnlock	Unlock the vise and remove the finished stock
5	outro	Listen to the narrator go over some final notes about the career

Map

The user will work on a manual lathe and manual milling machine inside a machining facility. They will see other people working on different machines.



Location 1 - Lathe Machine: The user will begin the experience at the workstation with a large lathe machine. At this location, there is a workbench with several important tools on it and the design process they will need for the day hanging above it. Once the user has completed the lathe machine section of the tutorial, they will be able to move to the next section using a teleport button on the workbench.



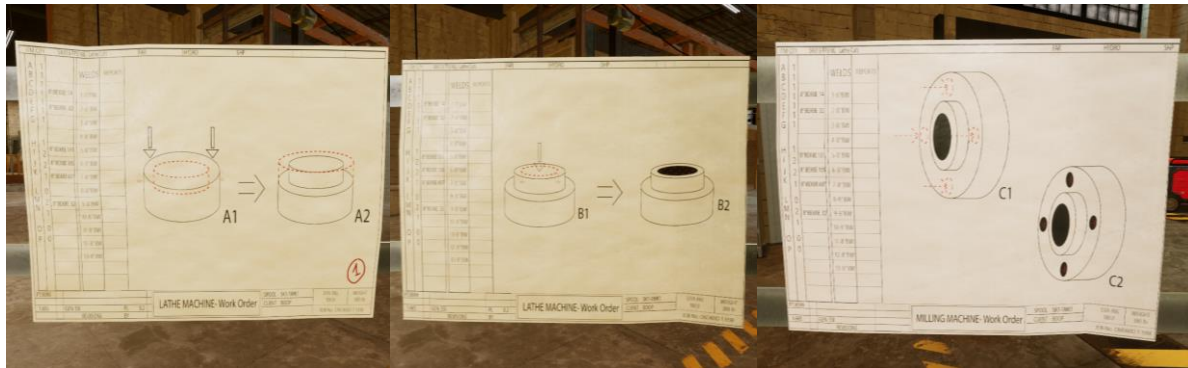
Location 2 - Milling Machine: At the second workstation, there is a large milling machine and a workbench to the right of it. On the workbench, they will be able to get the stock Vise handle and drill bit required to complete the milling process.



Key Objects

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

Design Drafts: The design drafts are hanging along the top of the workbenches behind the user in the simulation at both the lathe and milling machine. There are four different pages of design drafts, each containing different information. The first page of the design draft is an overview of the part that the user will be producing during the simulation. It shows a brief overview of all the different cuts they will need to make. The other pages of the design drafts display the information that the user will need for the main cuts using the lathe and milling machines.



Lathe Machine: The lathe machine is located at the lathe workstation where the user will begin the experience. The lathe machine has several different components, all of which will be detailed below. The lathe machine works by rapidly spinning the stock and cutting occurs when a cutting tool comes into contact with the spinning stock. This results in a very clean circular cut.



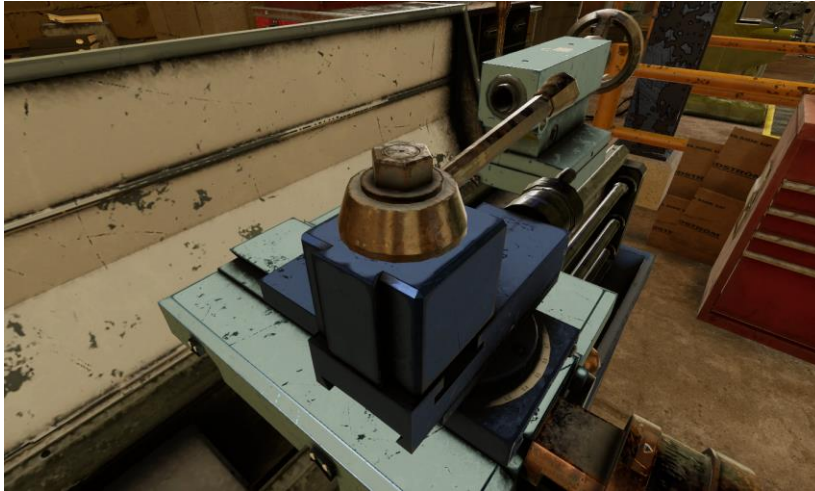
Carriage Wheel Crank: The carriage wheel crank is located on the centre of the lathe machine. It is a large crank with a handle on it that can move the carriage of the lathe machine left or right. The user can grab the crank and spin it to the left or counter clockwise to move the entire carriage to the left. They can spin the crank to the right or clockwise to move the entire carriage to the right.



Cross-Feed Wheel Crank: The cross-feed crank is located just above and to the right of the carriage wheel crank on the lathe machine. It is a medium sized crank with a handle on it that can move the cross feed forward and backward. The user can grab the crank and spin it to the left or counter clockwise to move the entire carriage to the forward. They can spin the crank to the right or clockwise to move the entire carriage to the backward.



Tool Post & Lever: The tool post and lever are both located on top of the carriage and cross-feed of the lathe machine. This is where the main cutting tool used in the first section will go. Once the cutting tool has been put on to a post, it can be locked into position by using the tool post lever. Pulling the lever toward the user will lock the cutting tool on the tool post and pushing it away from these areas will unlock it.



Spindle Lever: The spindle lever is located on the bottom right of the carriage of the lathe machine. The spindle lever will start or stop the chuck from spinning. Grabbing the spindle leader and pulling it up will start spinning the chuck and pulling it down will turn it off. There is a small light that will indicate if the spindle is on or off, green means it is on, red means off.



Tailstock & Lever: The tailstock is located on the right side of the lathe machine and the lever is located just behind the tailstock. These tailstock can hold a large drilling tool which can be used to punch circular holes straight through the stock. The user must first insert a drilling tool into the left side of the tailstock. Then the user can bring the carriage all the way to the right and into contact with the tailstock where they can then lock the tailstock to the carriage by rotating the lever to the left or counter-clockwise.



Tailstock Crank: The tailstock crank is located on the right side of the tailstock on the lathe machine. Once the drilling tool has been inserted into the tailstock and it has been moved into position by using the carriage, the drilling tool can be brought into contact with the stock by using the tailstock crank.



Chuck: The truck is located on the left side of the lathe machine and will hold onto the stock as it spins. The chuck will spin when the spindle lever is turned on. To open the truck, the user must insert the chuck and the truck will automatically open allowing the user to insert or remove the stock. Removing the chuck key will lock the chuck on the stock if it is inserted or will lock it shut if no stock is present.



Chuck Key: The chuck key is located on the workbench near the lathe machine. The user can pick up the chuck key, and insert it into the chuck to open it up. Removing the chuck key will lock the chuck on the stock if it is inserted and or will lock it shut if no stock is present.



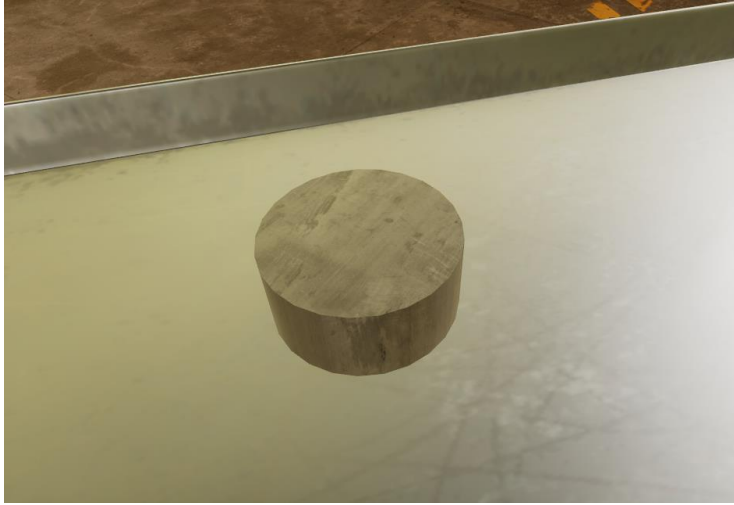
Cutting Tool: The cutting tool is located on the workbench near the lathe machine. The user can pick up the cutting tool, and put it onto the tool post of the lathe machine. Once it is on the tool post, it can be locked there by using the tool post lever. The cutting tool will cut into the stock when they come into contact and the spindle is on.



Drilling Tool: The drilling tool is located on the workbench near the lathe machine. The user can pick up the drilling tool and insert it into the left side of the tailstock. The drilling tool will punch a hole straight through the stock when it is brought into contact with it.



Stock: The stock is the wrong metal that the user will be cutting into throughout the simulation. At the beginning of the simulation, it is located on the workbench behind the user. They can pick it up and place it into the chuck of the lathe machine and later into the vise of the milling machine. Once it is locked in place (via the chuck key or vise handle), the user will not be able to pick it up again. The stock will be cut and shaped into a specific part using the different tools that the user will select at the beginning. As the tutorial progresses, if the user makes any mistakes they can grab another stock from the workbench which will keep any previous cuts made by the user, as a type of check point.



Airgun: The airgun is located on both the lathe and milling machines. The airgun can be picked up by the user, and with their other hand tap the big red button on the back of the air gun to turn on the air spray. They can then point the air gun towards the debris and blow the debris off of the machines.



Milling Machine: The milling machine is located at the second workstation that the user will move to after completing the lathing section. The milling machine is also able to make cuts through the stock however this machine will spin the cutting piece instead of the stock, similar to a drill press. The stock can be secured in place on the milling machine by putting it into the vice on the table of the machine and locking it there. The stock can be moved around using the three different cranks, the vertical knee traverse crank, the saddle traverse crank, and the table traverse crank, all of which are detailed below. To drill the stock when it is on the milling machine, The user will have to turn on the quill, which will spin the drill bit using the power labour and then they can bring the drill bit down into contact with the stock Using the quill feed handle which is on the upper right side of the milling machine.



Saddle Traverse Crank: The saddle Traverse crank is located in the centre of the milling machine just below the pallet. Rotating this crank will move the table forward and backward.



Vertical Knee Traverse Crank: The vertical knee traverse crank is located just to the left of the centre of the milling machine, next to and slightly below the saddle Traverse crank. The user can rotate this crank which will raise or lower the entire table of the milling machine.



Table Traverse Cranks: The table Traverse cranks are located on the left and right side of the table of the milling machine. If the user rotates one of these cranks, the pallet will move to the left and to the right.



Quill and Lever: The quill is located just underneath the large overhanging section of the milling machine. The quill will hold the selected drill bit in place, and spin it allowing the user to cut into the the quill will hold the selected drillbit in place, and spin it allowing the user to cut into the stock. the user can grab the quill feed handle, and pull it down which will move the drill bit down into the stock below.



Drill Bit: The drill bit is located on the workbench to the right of the milling machine. The user can pick up the drill bit and insert it into the quill of the milling machine. Once the drill bit has been inserted into the quill, the user can start drilling by using the quill feed handle.



Vice: The vice is located on the pallet of the milling machine. The vice will hold the stock in place while it is being cut. To open the vice, the user will have to grab the vice handle from the workbench and place it onto the knob that is facing the user. They will then have to rotate the handle to be right if they wish to lock the vice and move it to the left if they wish to unlock the device. Once they have a locked or unlocked device, the user can grab the vice handle and pull it off removing it.



Vise Handle: The vice handle is located on the workbench by the milling machine. It is used to lock or unlock the vice. Once the vice handle has been placed on to the vice, rotating it to the right or clockwise will lock the vice and rotating it to the left or counterclockwise will unlock the vice. To remove the vice handle, grab it and pull it away from the vice and it will snap off.



Freeplay vs. Tutorial:

In the tutorial, the narrator will walk the user through how to set up and use the lathe machine and the milling machine. They will go over the design drafts, how to clean up the workstation and how to properly set up all the parts of a lathe machine. Then, the user will need to make two different cuts with the lathe machine. After that section is complete, the user will move to the milling machine area and have to complete four different drills using the machine.

In freeplay, The user will be able to work on both the lathe machine in the milling machine without any guidance. They will have to read over the design drafts themselves and determine what must be done in order to complete the requested part.