



3. HVAC Technician Manual

General Overview:

Standing experience.

- In HVAC Technician, the user will work on a rooftop area, fixing different breakdowns with four HVAC units.
- The user will be tasked with refilling refrigerant, fixing split wires, replacing old compressors and replacing broken fans.
- The user will work on the top of a large building, move between a large workstation with several tools to four different spots with HVAC units.

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

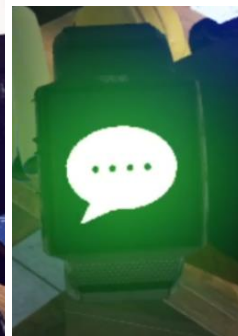


Image 3

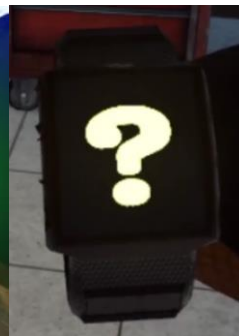


Image 4

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 the VR hand is near the tablet, it will automatically point with an index finger which can be used to tap the screen. Tapping on the large boxes with numbers inside of them will move the user 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 your watch by holding your right hand above the watch icon on your left wrist.
1	B	Listen to instructions from the narrator.
1	C	Move to location 1 using the teleportation map. When your hand is near the tablet,

		it will automatically point with your index finger which you use to tap the screen.
1	D	Select the breakdown type "low refrigerant fluid" by tapping on the manual above the teleportation map.
1	E	Move to the workstation location using the teleportation map. When your hand is near the tablet, it will automatically point with your index finger which you use to tap the screen. Then, grab the manifold gauge (the yellow device with a blank screen and a red and blue dial on the front) from the workstation.
1	F	While holding the manifold gauge, use your other hand to move to location 1 using the teleportation map. When your hand is near the tablet, it will automatically point with your index finger which you use to tap the screen.
1	G	Hang the manifold gauge on the indicated area of the HVAC unit. To hang it, place the manifold gauge onto the indicated area (via a blue arrow) and it will snap into place.
1	H	Move to the workstation location using the teleportation map. When your hand is near the tablet, it will automatically point with your index finger which you use to tap the screen. Then grab a large red refrigerant tank from the workstation.
1	I	While holding the refrigerant tank, use your other hand to move to location 1 using the teleportation map. When your hand is near the tablet, it will automatically point with your index finger which you use to tap the screen.
1	I2	Place the refrigerant tank onto the ground at the highlighted location next to the HVAC unit.
1	J	Attach the three hoses from the bottom of the manifold gauge onto the HVAC unit. The hose with a red valve goes onto the corresponding red pipe underneath the manifold. The blue hose goes onto the corresponding blue pipe underneath the manifold. The yellow hose goes onto the corresponding yellow valve on the refrigerant tank. When all three are attached correctly, the icon on the manifold gauge will change.
1	K	Grab the valve on top of the refrigerant tank and rotate it to the left or counter clockwise to open the tank. When it is fully opened, the icon on the manifold gauge will change.
1	L	Grab the blue dial on the manifold gauge and slowly rotate it to the right or clockwise, keeping an eye on the progress bar on the screen located just above the blue dial. When the bar becomes green, you can stop filling it and you will see a checkmark flash green on the screen. Do not rotate the red dial as this will cause the yellow hose to disconnect from the tank. If this does happen, the user must re-attach the yellow hose to the refrigerant tank.
1	M	Grab the valve on top of the refrigerant tank and rotate it to the right or clockwise to close the tank.

1	N	Disconnect the three hoses of the manifold gauge from the HVAC unit. Grab the red, blue, and yellow hoses and place them back underneath the manifold gauge. If they are dropped, they'll snap back into position.
1	O	Listen to the narrator and wait for another call to come in.
2	A	Answer your watch by holding your right hand above the watch icon on your left wrist.
2	B & C	Fix the wires at location 2. Move to location 2 using the teleportation map. When your hand is near the tablet, it will automatically point with your index finger which you use to tap the screen. First, turn off the power by grabbing then sliding the power lever on the right side of the HVAC unit down. Then, open up the bottom door underneath the fan. Grab the drill from the toolbelt and remove the four screws from the panel. This drill will automatically tighten or loosen screws when it comes into contact with one. When the screws are fully removed, a yellow burst of confetti will appear. Grab the yellow wire strippers from the toolbelt. Remove the plastic coating from the split in the wires by touching the split area with the tip of the wire strippers. Grab a wire connector from the toolbelt and attach it to the stripped section of wire. Grab the blue wire crimpers from the toolbelt and crimp the wire connector. To crimp the wires, touch the wire connector with the tip of the wire crimpers. Place the panel back onto the HVAC unit and tighten the four screws. Then, turn the power back on by grabbing and sliding the red power lever up.
3	A & B	Fix the fan at location 3. Move to location 3 using the teleportation map. When your hand is near the tablet, it will automatically point with your index finger which you use to tap the screen. First, turn off the power by grabbing then sliding the power lever on the right side of the HVAC unit down. Then, grab the drill from the toolbelt and remove the four screws from the fan panel. This drill will automatically tighten or loosen screws when it comes into contact with one. When the screws are fully removed, a yellow burst of confetti will appear. Grab and remove the fan panel. Move to the workstation location and grab a new fan from the ground and return to location 3. Place the new fan into the HVAC unit. Place the fan panel back onto the machine and tighten the four screws. Then, turn the power back on by grabbing and sliding the red power lever up.
4	A & B	Fix the compressor at location 4. Move to location 4 using the teleportation map. When your hand is near the tablet, it will automatically point with your index finger which you use to tap the screen. First, turn off the power to the HVAC unit by grabbing it and sliding the red power lever down. Then, grab the blow torch from the tool bench above the unit and open up the door on the left side. Heat up the two connections between the compressor and the pipes leading to the HVAC unit.

	<p>This blow torch will automatically turn on when it comes into contact with a connection point. When the connections are fully heated, a yellow burst of confetti will appear. Then, grab the drill from the toolbelt and remove the four screws from the base of the compressor. This drill will automatically tighten or loosen screws when it comes into contact with one. When the screws are fully removed, a yellow burst of confetti will appear. Grab and remove the compressor from the HVAC unit. Move to the workstation location, grab a new compressor from the ground and return to location 4. Place the new compressor into the HVAC unit and tighten the four screws. Then, grab the welding torch from the tool bench and weld the two connection points between the compressor and the pipes leading to the HVAC unit. This welding torch will automatically turn on when it comes into contact with a connection point. When the connections are fully welded, a yellow burst of confetti will appear. Finally, turn the power back on by grabbing and sliding the red power lever up.</p>
4 C	Listen to the narrator's final tips

Map

The user will be working on a rooftop where they must fix four HVAC units.



Home Location - Workstation: This is where the user begins the experience. They have a tool belt with all of the tools they will need in tutorial mode and in free play. They have additional parts required for fixing common breakdowns. These are the refrigerant tanks, fans and compressors. This is also where the manifold is located. From here, the user can look through the pages in the manual to learn about how to solve problems and move to the other locations by using the teleportation map.



Location 1 - HVAC Unit #1: There is a fixable HVAC unit at this location to the left of the teleportation map and manual. On top of the HVAC unit is a toolbelt that contains the tools required for fixing them. There is a non-interactable HVAC unit on the right side of the teleportation map. In the tutorial, this unit will have low refrigerant fluids.



Location 2 - HVAC Unit #2: There is a fixable HVAC unit at this location to the right of the teleportation map and manual. On top of the HVAC unit is a toolbelt that contains the tools required for fixing them. There is a non-interactable HVAC unit on the left side of the teleportation map. In the tutorial, this unit will have broken wires.



Location 3 - HVAC Unit #3: There is a fixable HVAC unit at this location to the right of the teleportation map and manual. On top of the HVAC unit is a toolbelt that contains the tools required for fixing them. In the tutorial, this unit will need a fan replaced.



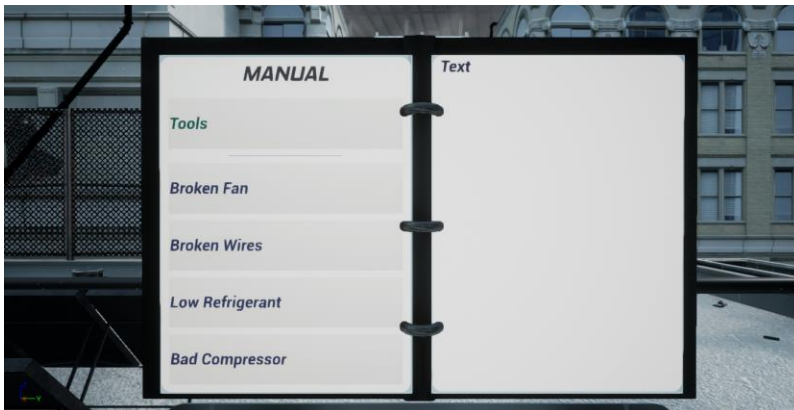
Location 4 - HVAC Unit #4: There is a fixable HVAC unit at this location to the right of the teleportation map and manual. On top of the HVAC unit is a toolbelt that contains the tools required for fixing them. In the tutorial, the compressor will need to be replaced.



Key Objects

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

Manual: The manual is located above the teleportation map at every location in the simulation. It contains information about the tools available to the user and a list of common breakdowns and how to fix them. When the user's hand is near the manual, it will automatically point with the index finger which they can use to tap the screen. The specific information inside the manual for common breakdown is listed further down in this manual.



HVAC Units: There are four interactable HVAC units located at locations 1, 2, 3, and 4. These can break down in one of four ways, which are detailed below. There is a power lever on the right side of the unit, manifold pipes to the left of the power unit, a fan and wire compartments in the middle, both located under panels that have to be removed using the drill and on the right is the compressor behind a door. On top of the unit is a tool belt and a box of wire connectors. There are additional fan panels to the side of the unit and wire panels on top of the unit.



Tool Belt: There is a toolbelt at every location. It holds all the tools the user will need to fix common breakdowns except for the manifold gauge, which is located at the home workstation location. Inside the toolbelt is the drill, wire strippers, wire crimpers, blow torch and welding tool.



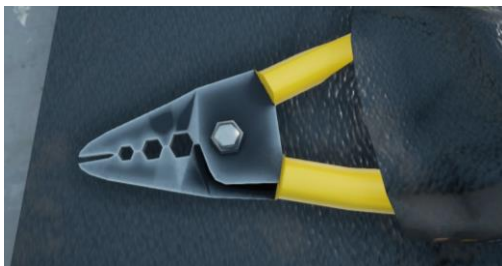
Drill: The drill is located in the toolbelt and can tighten or loosen screws. There are screws that hold the compressor in place and the panels for the wires and fans in place. This drill will automatically tighten or loosen screws when it comes into contact with one. When the screws are fully removed or secured, a yellow burst of confetti will appear.



Screws: The screws are located around the simulation and are part of the panels or compressor that they hold in place. They cannot be grabbed or picked up and only interact with the tip of the drill. They can be loosened or tightened using the drill and a yellow burst of confetti will appear when they are fully loose or tight.



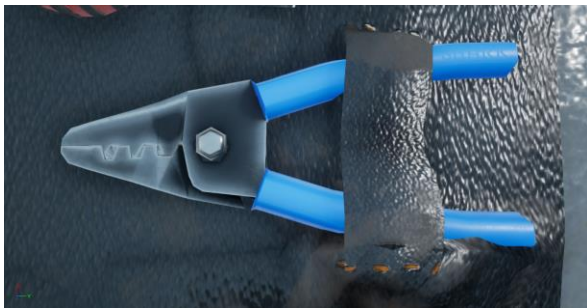
Wire Strippers: The yellow wire strippers are located in the toolbelt. They can remove the plastic coating from split wires by picking up and then touching the split area with the tip of the wire strippers.



Wire Connector: The wire connectors are located in a box by the toolbelt. They can attach to the stripped section of wire, fixing the split.



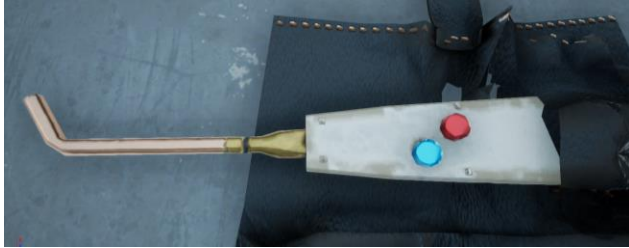
Wire Crimper: The blue wire crimpers are located in the toolbelt and can crimp the wire connector. To crimp the wire connectors, grab the crimpers and then touch the wire connector with the tip of the wire crimpers.



Blow Torch: The blue blow torches are located in the tool belt. When grabbed, the torch can heat up the two connections between the compressor and the pipes leading to the HVAC unit. It will automatically turn on when it comes into contact with a connection point. When the connections are fully heated, a yellow burst of confetti will appear.



Hand Welding Tool: The silver hand welding tools are located in the tool belt. When grabbed, the welding torch can weld the two connection points between the compressor and the pipes leading to the HVAC unit. When the connections are fully welded, a yellow burst of confetti will appear.



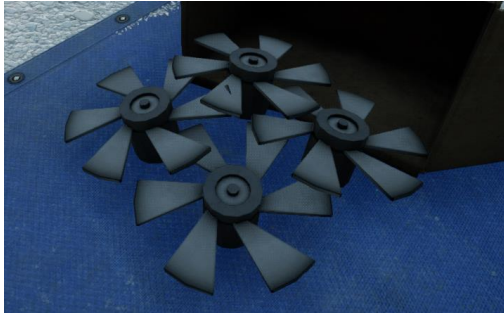
Manifold Gauge: The manifold gauge is located at the home workstation location. They can be grabbed and snapped onto the side of the HVAC units. When attached to the HVAC unit, the red and blue hoses must be connected to the HVAC unit hoses that are located just underneath the manifold and the yellow hose attaches to a refrigerant tank. Once the tank is open, rotating the blue dial to the right or clockwise will slowly refill the HVAC unit. If it is overfilled, the user must restart. Grabbing the red dial can cause the attached yellow hose to disconnect from the refrigerant tank.



Refrigerant Tank: The red refrigerant tanks are located at the home workstation location. They can be picked up and brought to the side of the HVAC unit where a large blue hologram indicates where they need to be placed. When placed, the user can attach a yellow hose from the manifold gauge to the tank. When attached, the tank can be opened by rotating the top black valve to the left or counter clockwise.



Fans: The fans are located inside each of the HVAC units and replacement ones are at the home workstation location and. They can be grabbed and inserted in the fan socket on the HVAC unit if the main panel covering them is removed. The power must be turned off to grab a broken fan from the HVAC unit.



Extra fans at the workstation



Fan inside the HVAC units

Fan Panel: The fan panel covers the fan on the HVAC unit. It can be removed by loosening the four screws at each corner of the panel and then grabbing it and pulling it away. There are additional fan panels located to the sides of the each HVAC units



Wire Panel: The fan panel covers the wires on the bottom of the HVAC unit. It can be removed by loosening the four screws at each corner of the panel and then grabbing it and pulling it away. There are additional wire panels located on top of each HVAC unit.



Compressor: The compressors are located inside the HVAC units and replacement ones are at the home workstation location. They can be grabbed and inserted in the compressor location

on the HVAC unit. To remove a broken compressor the four screws must be removed and the connection points must be heated up using a blow torch. To add a new compressor, the four screws must be tightened in place using the drill and the connection points welded using the hand welding tool.



The information from the manuals

Common Breakdowns:

Low Refrigerant: Grab a manifold gauge from the workstation and bring it to the broken HVAC unit. Hang the manifold gauge on the indicated area of the HVAC unit. To hang it, place the manifold gauge onto the area and it will snap into place. Return the workstation and grab the large red refrigerant tank from the workstation. Return to the area with the broken HVAC unit and place the refrigerant tank onto the ground at the highlighted location. Attach the three hoses from the bottom of the manifold gauge onto the HVAC unit. The hose with a red valve goes onto the corresponding red pipe underneath the manifold. The blue hose goes onto the corresponding blue pipe underneath the manifold. The yellow hose goes onto the corresponding yellow valve on the refrigerant tank. Grab the valve on top of the refrigerant tank and rotate it to the left or counter clockwise to open the tank. Grab the blue dial on the manifold gauge and slowly rotate it to the right or clockwise, keeping an eye on the progress bar on the screen located just above the blue dial. When the bar becomes green, stop filling it and a checkmark will flash green on the screen.

Do not rotate the red dial as this will cause the yellow hose to disconnect. Grab the valve on top of the refrigerant tank and rotate it to the right or clockwise to close the tank. Disconnect the three hoses of the manifold gauge from the HVAC unit. Grab the red, blue and yellow hoses and place them back underneath the manifold gauge. If they are dropped, they'll snap back into position.

Broken Wires: First, turn off the power by grabbing then sliding the power lever on the right side of the HVAC unit down. Then, open up the bottom door underneath the fan. Grab the drill from the toolbelt and remove the 4 screws from the panel. This drill will automatically tighten or loosen screws when it comes into contact with one. When the screws are fully removed, a yellow burst of confetti will appear. Grab the yellow wire strippers from the toolbelt. Remove the plastic coating from the split in the wires by touching the split area with the tip of the wire strippers. Grab a wire connector from the toolbelt and attach it to the stripped section of wire. Grab the blue wire crimpers from the toolbelt and crimp the wire connector. To crimp the wires, touch the wire connector with the tip of the wire crimpers. Place the panel back onto the HVAC unit and tighten the 4 screws. Then, turn the power back on by grabbing and sliding the red power lever up.

Replace Fan: First, turn off the power by grabbing then sliding the power lever on the right side of the HVAC unit down. Then, grab the drill from the toolbelt and remove the 4 screws from the fan panel. This drill will automatically tighten or loosen screws when it comes into contact with one. When the screws are fully removed, a yellow burst of confetti will appear. Grab and remove the fan panel. Move to the workstation location and grab a new fan from the ground and return to location 3. Place the new fan into the HVAC unit. Place the fan panel back onto the machine and tighten the 4 screws. Then, turn the power back on by grabbing and sliding the red power lever up.

Bad Compressor: First, turn off the power to the HVAC unit by grabbing it and sliding the red power lever down. Then, grab the blow torch from the tool bench above the unit and open up the door on the left side. Heat up the two connections between the compressor and the pipes leading to the HVAC unit. This blow torch will automatically turn on when it comes into contact with a connection point. When the connections are fully heated, a yellow burst of confetti will appear. Then, grab the drill from the toolbelt and remove the four screws from the base of the compressor. This drill will automatically tighten or loosen screws when it comes into contact with one. When the screws are fully removed, a yellow burst of confetti will appear. Grab and remove the compressor from the HVAC unit. Move to the workstation location, grab a new compressor from the ground and return to location 4. Place the new compressor into the HVAC unit and tighten the four screws. Then, grab the welding torch from the tool bench and weld the two connection points between the compressor and the pipes leading to the HVAC unit. This welding torch will automatically turn on when it comes into contact with a connection point. When the connections are fully welded, a yellow burst of confetti will appear. Finally, turn the power back on by grabbing and sliding the red power lever up.

Freeplay vs. Tutorial:

In the tutorial, the narrator will walk the user through how to fix the first HVAC unit. This will involve getting the manifold gauge and refrigerant tank from the workstation and bringing them over to location 1. Then, the user must properly follow the steps from the narrator on how to refill the fluids to fix this unit. Once the HVAC unit is up and running, the narrator will call the user back and ask them to fix unit 2, 3, and 4. Once the user has fixed all four of the units, the experience will end.

In freeplay, the HVAC units will break in a random order and the user must move between all four of the locations to find the break and fix them following the steps in the manual.