



## 11. Construction Welder Manual

### General Overview:

Standing experience.

- In construction welder, the user will be able to try out the three main types of welding on an unfinished building.
- They will use MIG welding to fix a broken skid steer loader on the bottom floor.
- They will use TIG welding to connect two pipes together on the second floor.
- On the top floor of the building, they will use stick welding to connect rebar together for the foundation.
- Each type of welding has a different type of setup and the way that you weld is slightly different.

### 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

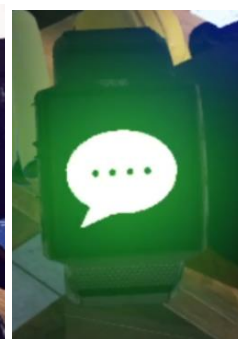


Image 3

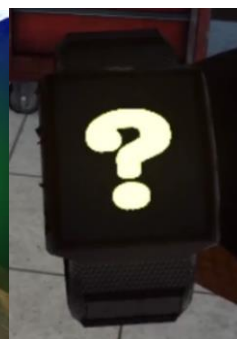


Image 4

**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.

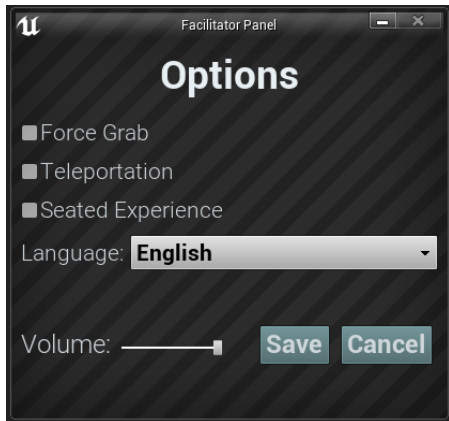
**Settings:** This will bring the facilitator into a separate menu screen where they have multiple options to change the experience. This is detailed below.

**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 from the narrator
1	faceGrab	Grab the welding mask from the workbench

1	faceOn	Put the welding mask on
1	powerMIG	Power on MIG welding generator by flipping the switch on the front of the generator
1	gasOpen	Open the gas cylinder valve by rotating it counter-clockwise
1	gaugeGreen	Open the gas-gauge valve by rotating it counter-clockwise until the dial is in the green area
1	wireGrab	Grab wire spindle from the box next to the work bench
1	wirePlace	Attach the wire spindle to the MIG generator
1	wireLoose	Loosen the wire clamp by rotating it counter-clockwise
1	wireConnect	Place wire spindle end into the intake location just to the left of the wire spindle
1	wireTight	Tighten the wire clamp by rotating it clockwise
1	powerSet	Set the power dial near the bottom of the MIG generator to DC+ by rotating it
1	clampGrab	Grab the ground clamp from the front of the MIG generator
1	clampConnect	Connect the ground clamp to skid loader arm where the hologram is located
1	faceLower	Lower the face shield by grabbing the front of it and pulling it down
1	gunGrab	Grab the welding gun from the front of the MIG generator
1	weldComp	Fix the broken skid steer loader by welding back and forth across the break until it is above 70%
1	faceOff	Remove the welding mask by grabbing the back of it
1	teleportElev	Teleport to the elevator by pressing the button on the map tablet
2	elevator	Tell them they are fabulous(welding completed)
2	openElev	Open elevator fence to get in
2	levelPush	push lever forward to go up
2	floor2	Elevator stops at required floor
3	openElev	Open the elevator fence
3	info	Listen to the narrator explain TIG welding
3	faceOn	Grab and put on the welding mask on
3	powerTIG	Power on TIG welding generator by pressing the button on the front
3	gasOpen	Open the gas cylinder valve by rotating it counter-clockwise
3	gaugeGreen	Open the gas-gauge valve by rotating it counter-clockwise until the dial is in the green area

3	powerSet	Set the power dial to AC which is on the front of the generator
3	clampGrab	Grab the ground clamp that is on top of the generator
3	clampConnect	Connect the ground clamp to pipe end where the hologram clamp is located
3	faceLower	Grab and lower the welding mask
3	electrodeGrab1	Grab a tungsten electrode from the toolbox in front of the pipe
3	electrodeOn	Place it inside the tip of the welding gun
3	fillerGrab1	Grab a piece of filler metal from the toolbox in front of the pipe
3	weldStart1	Start welding the pipe joint by putting the filler metal on the gap of the pipe and then bring the welding gun into contact with the pipe at that location
3	electrodeDull	Listen to the narrator explain that the tungsten electrode is dull
3	electrodeGrab2	Grab the tungsten electrode from the welding gun to remove it
3	grinderOn	Power on the grinder by pressing the button in the middle of it
3	electrodeSharp	Sharpen the electrode by bringing it close to the spinning wheels
3	grinderOff	After sharpening is complete power off the grinder
3	weldStart2	Resume TIG welding the pipe
3	fillerGrab2	Grab a new piece of filler metal
3	weldComp	Resume TIG welding the pipe
3	weldComp2	Remove the welding mask by grabbing the back of it
3	faceOff	Go to elevator by using the teleport tablet
3	teleport	Open up the elevator
3	elevatorUp	Head to the top floor by pressing button 3
3	elevatorUp2	No dialogue
4	floor3	Listen to the narrator
4	info	Listen to the narrator explain stick Welding
4	rebarGrab	Grab rebar from the case
4	rebarPlace	Place rebar into the 2 highlighted spots
4	faceOn	Grab and put on the welding mask
4	powerStick	Press the power button on stick welding generator
4	clampGrab	Grab the ground clamp from the top of the stick welding generator
4	clampConnect	Connect ground clamp to the top of the rebar where the hologram is located
4	electrodeGrab	Grab electrode from the workbench
4	electrodeClamp	Grab the welding clamp and place the electrode into the clamp

4	faceLower	Pull down the face shield down
4	weldComp	Weld together one set of rebar. It needs to be at least 70% welded together to complete
4	clampConnect2	Reconnect the clamp to the other rebar
4	weldComp2	Complete welding the 2nd rebar joint
4	faceOff	Remove face shield by grabbing the back of it
4	outro	Listen to final notes from the narrator about the career

**Map**

**Location 1 - Ground Floor:** The ground floor is where the user will begin the experience in both the tutorial in freeplay modes. At this location, they will be able to set up a MIG generator and then weld a broken skid-steer arm using MIG welding. In the tutorial, once they have completed this world, they will be able to move to the construction elevator and move up to the second floor.



**Location 2 - 2nd Floor:** The second floor of the simulation is where the user will learn about in use TIG welding. They will have to first set up the TIG generator and then well together two pipes.



**Location 3 - Rooftop:** The rooftop of the building is where the user will learn about and use STICK welding. they will first have to set up the welding generator, then weld together a few pieces of rebar.



## Key Objects

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

**MIG Generator:** The MIG generator is located on the ground floor of the building. There is a power switch on the front of the generator near the top, and a dial lower down that the user will need to adjust to DC+ plus to weld properly. The MIG welding gun and ground clamp are also located on the front of the generator. There is a wire spindle holder, a small intake location for that wire, and a wire clamp that is on the right side of the machine. This is the side that the user will likely be facing when the simulation begins. On the backs of the MIG generator, are two gas cylinders that the user will need to open to allow MIG welding to a car properly.

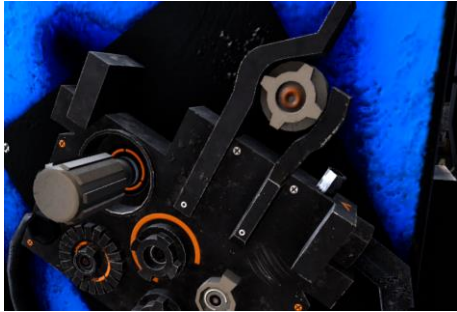


**Wire Spindle:** The wire spindle is a large coil of bronze colored wire that is located in front of a workbench to the right of the MIG generator. When instructed, the user will need to pick up the wire spindle and place it on to the side of the MIG generator. Once it has been placed on the back of the MIG generator, the user will need to grab the small tip of wire coming off of the coil and place it into the intake location to the left.





**Wire Clamp:** The wire clamp is located on the right side of the MIG generator. The user can rotate the clamp to the left or counterclockwise to unlock the wire intake and then rotate to the right or clockwise to secure the wire once it has been placed inside.



**Welding Mask:** There are welding masks located at all three work stations in the simulation, usually on the workstation near the generators. They can be picked up and placed on the head of the user, and they will snap into the correct location. Once they are on the user's head, they can grab the front of the mask and pull it down to protect their eyes from the bright glow from welding. They can also grab the back of the welding helmet when instructed, to remove them from their head.



**Gas Cylinders:** There are two gas cylinders that are located on the ground and 2nd floor of the building. To MIG and TIG weld, the user must first open up the valve that feeds the gas into the welding gun. The user will need to turn the valve on the top left side of the gas cylinder counter-clockwise. Then, they will need to adjust how much gas is being fed into the generator by rotating the small T-dial counter-clockwise until the second gauge on the right is in the green.



**Ground Clamp:** There are ground clamps located on all floors of the simulation. The ground clamp is located on the front of the MIG generator on the ground floor, and on top of the TIG generator and STICK generators. The ground clamps are required for welding, as without them there will not be a continuous flow of electricity from the welding gun into the metal that is being welded. To use the ground clamp, the user has to pick it up and place it on the metal they are trying to weld.



**MIG Welding Gun:** The MIG welding gun is located on the front of the MIG generator. Once the user has fully set up the MIG generator and attached the ground clamp to the arm of the skid steer loader, they can start to weld the crack in the arm. Before starting to weld, the user should pull down the welding mask to protect their eyes from the bright lights produced from welding. To MIG weld, the user must slowly bring the tip of the welding gun back and forth from one side of the crack in the skid-steer arm to the other. If they move too quickly they will not be able to well. from one side of the crack in the skid steer arm to the other. If they move too quickly they will not be able to weld. This is a very precise motion they need to make it will not work every time.



**Skid Steer Loader:** The skid steer loader is located on the ground floor of the building. It has a broken front left arm, as indicated by the blue arrows. The user will need to fix this using MIG welding. The user will have to weld along the side of the arm and top of it in order to achieve a welding percentage of 100%.



**Construction Elevator:** The construction elevator is used to help the user get between the ground floor, second floor, and top floor. this construction elevator does not have a button on the outside, so to open it up and get inside, the user must grab the handle on the middle bottom part of the front door and slide it up. Once the user lifts up the elevator door to about waist height, it should slide open the rest of the way, bringing the user inside. The inside of the elevator has three buttons labelled 1, 2, and 3 and a skip button and a handle on the door so the user can get out. Once the user is inside, they can select the floor that they wish to move to in the elevator will take them there. It is possible that some users will experience a mild amount of motion sickness from the movement of the elevator, if they do it is recommended to press the skip button underneath the floor button and it will instantly take them to the selected floor.



**TIG Generator:** The TIG generator is located on the second floor of the building. It has a power button on the front of it and a small dial that the user will need to rotate to a c in order to take weld. On top of the TIG generator, is the TIG welding gun, and ground clamp.



**TIG Welding Gun:** The TIG welding gun is located on the second floor of the building on top of the TIG generator. To use the TIG welding gun, the user must first insert an electrode into the tip of the gun. Then pick up a piece of filler metal from the bench in front of the pipe. They can then put the filler metal on to the pipe where they wish to weld and then bring the tip of the electrode in the welding gun into contact with it when these two objects come together on top of the pipe they can move them together and it will create Wells down the crack in the pipe.



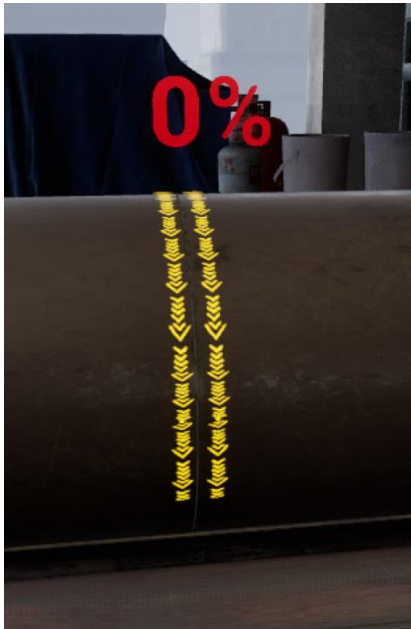
**TIG Electrode:** The TIG electrode is located in a small red box in front of the pipe on the second floor. The user can pick up the tig electrode, and insert it into the nozzle of the TIG welding gun. Once the user has been welding for a bit, the electrode will become dull and the user can no longer weld. They must remove the tig electrode from the tip of the welding gun by grabbing it, then bringing it over to the grinder in sharpening the electron by bringing the doll and into contact with the spinning wheels of the grinder. The user can then insert the sharpened electrode back into the TIG welding gun, and continue welding.



**Filler Metal:** There are multiple filler metals located in a small red box in front of the pipe on the second floor. The user can pick up a piece of filler metal from the box and use this to TIG weld. The filler metal was slowly getting used up as the user welds, and when it is small enough they will not be able to weld. They must grab a new piece of filler metal before they can continue.



**Pipes:** The pipes are located on the second floor of the building. There are two pipes, that are side by side with a small gap in between them as indicated by the yellow highlighters. The user must attach the ground clamp to the right side of the pipe before they begin welding. The user must then weld the gap in between these two pipes using TIG welding.



**Grinder:** The grinder is located on the workbench on the second floor. There's a red switch in the middle of the grinder that the user can tap to turn on the wheels. When the grinder is on, the user can sharpen a dull electrode by bringing the dull tip into contact with the spinning wheels. Some small sparks will appear as the electrode gets sharpened.



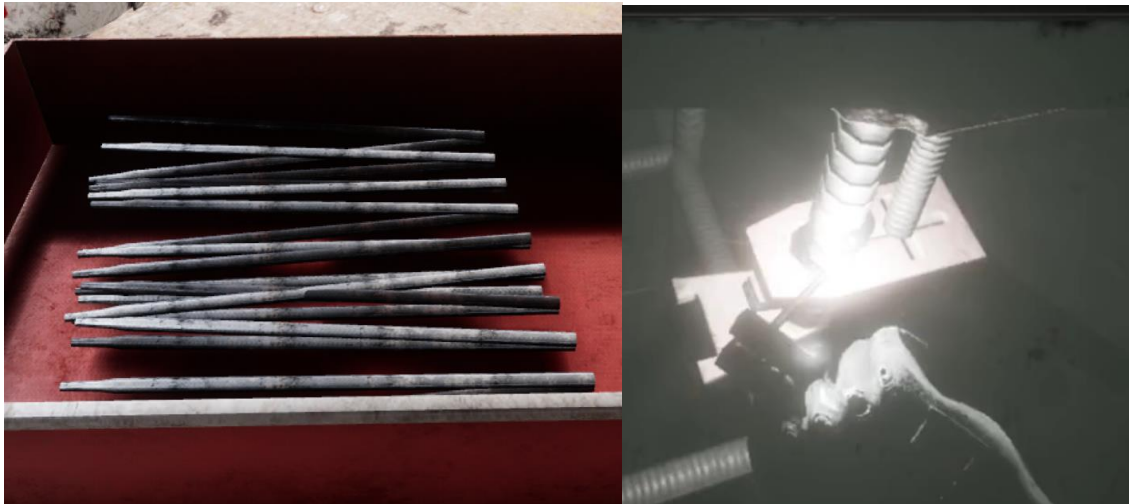
**STICK Generator:** The STICK generator is located on the top floor of the building. This generator is a little more simple than the other two, all the user needs to do is flip on the power switch and they can begin welding.



**STICK Welding Clamp:** The stick welding clamp is located on top of the stick generator. The user can pick up the welding clamp and attach a stick electrode into the jaws of the clamps. While holding the welding clamps, the user can bring the electrode into contact with the rebar to start welding if the rebar is grounded.



**STICK Electrode:** The stick electrode is located on the top of the generator. The user can pick up an electrode and place it into the job of the stick welding clamp. When this electrode is brought into contact with the rebar, it will produce a weld.





**Rebar:** There are several pieces of rebar that are all located on the top floor of the building. the user can pick up a piece of rebar from the case, and put it into place on top of the other rebar where it will be automatically secured using the clamps. the user can place the ground clamp onto the top piece of rebar, and then start welding the point between the two rebar.



### **Freeplay vs. Tutorial:**

In the tutorial, the narrator will walk the user through how to use all three types of welding. They will begin on the ground floor of the building and learn how to MIG weld and be able to fix a broken skid steer loader's arm. They will then take a construction elevator up to the second floor, where they will learn about and use TIG welding to connect two pipes together. from there, the user will travel up to the top floor of the building where they will learn about stick welding and weld some rebars together. There are several constraints put in place in the tutorial to ensure that the user is not able to accidentally mess up the process of setting up the different types of welding. For example, once the MGI generator has been turned on, you cannot turn it off to avoid the possibility that the user accidentally flipped the switch off when they weren't looking.

In freeplay, the user can go to any floor right from the beginning and try out all the different types of welding. Once the user has completed a weld on any of the forest, a try again button will appear which will reset all of the wells the user has complete allowed allowing them to continue practicing