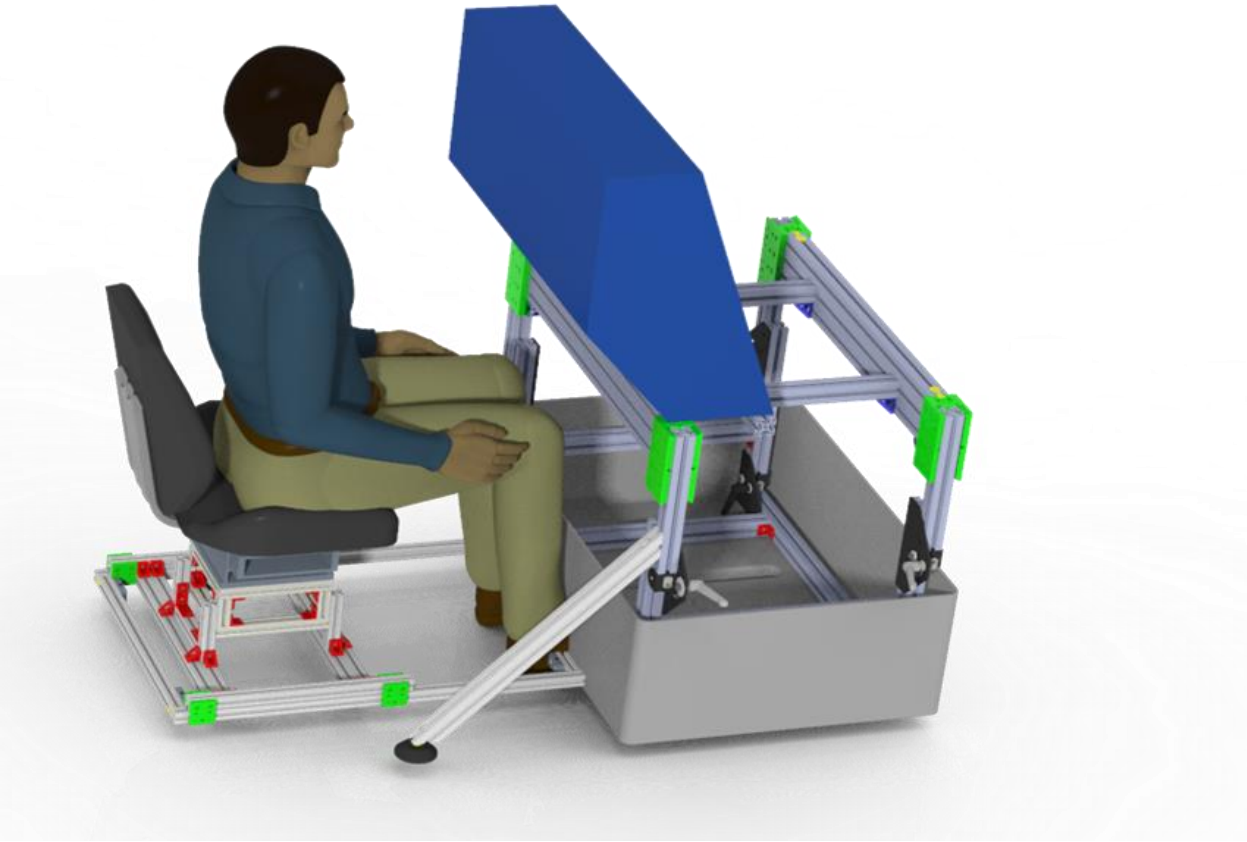
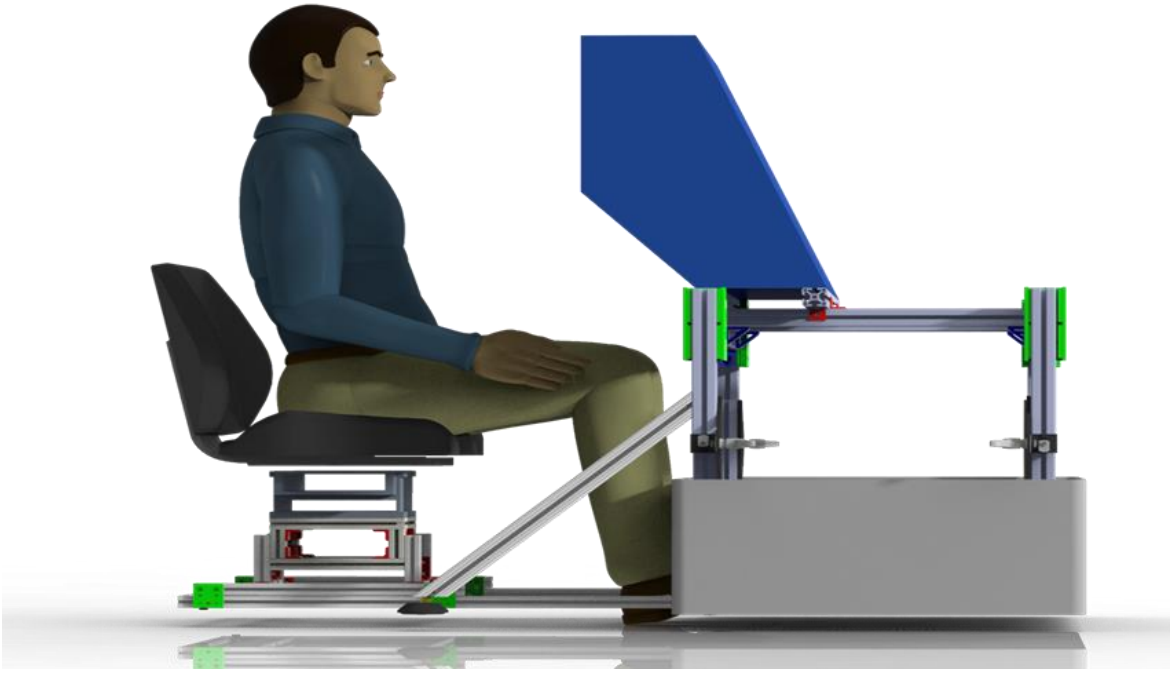
T515 Lockheed Martin Deployable Trainer Mount Operations Manual





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Product Description:

This product contains two components that are stored in two transit cases: a mounting structure to support the simulator, and a chair assembly to support the person using the simulator. Below you will find step-by-step instructions on how to assemble, disassemble, and stowaway the items into their respective cases. Any further questions can be addressed to the emails displayed below.

Notable Project Contributors and Contact Information:

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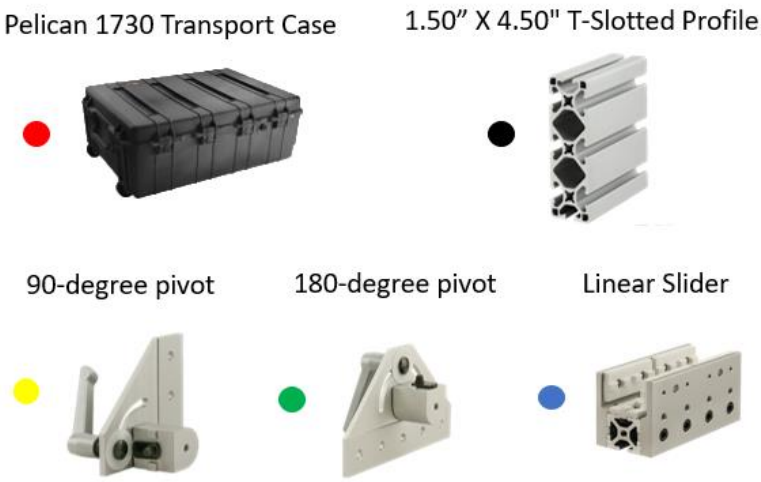

Above is a picture of the assembled simulator mount for reference with assembly and disassembly. The piece with two black dots on it is the tabletop, the four blue dots indicate the

linear sliders, the green dots indicate the 180-degree pivots, and the yellow dots indicate the 90-degree pivots.

Simulator Mount Setup Instructions:

I. Starting with the cases being closed, begin with undoing the 8 latches that hold the lid closed.

II. With the lid unlatched, fully open the lid. It should be sitting straight up when it's fully opened.

III. With the lid open, you should see the tabletop resting on-top of the rest of the simulator mount.

IV. With each person standing on opposite sides of the tabletop, have each person grab the tabletop from each side and lift it simultaneously out of the case. Proceed to gently rest this piece on the ground.

V. Next, have each team member go to one side of the case.

VI. Have each team member reach inside the case and locate the 4 handles that are used to lock the moving linkages in place. Have each team member twist the handles until the linkages are able to move.

VII. Once all 4 linkages are free to move, have each team member grab both of the top linkages.

VIII. By pulling these linkages up in a vertical motion, all the linkages should unfold in one, fluid motion. (If not, fold out the top linkages before folding out the bottom linkages.

IX. Once the linkages are unfolded and are sitting straight up, tighten the handles for the top and bottom linkages closer to the lid with one hand and using the other hand to hold the linkages upright. (Exercise maximum caution during this step to avoid the possibility of linkages falling and/or pinching anyone.)

X. Once one side is tightened, tighten the remaining the handles to secure all linkages.

XI. Once all linkages are tightened, double-check the linkages to make sure they are standing straight up, and the handles are locked down tight.

XII. IMPORTANT, at this point the team members should place the pins into the drilled holes on the upper linkage of the erected structure to not only set the height, but also act as a safety measure in the event the slider grip fails.

XIII. Next, have each team member move to the tabletop that was previously set down on the ground.

XIV. Both team members should stand on either side of the tabletop and carefully lift it up from the ground (Make sure to focus on lifting with your legs and not your back as this may cause injury if lifted incorrectly.).

XV. Once both team members have safely lifted the tabletop, have the team members carefully walk towards the case with the support structure fully erect and stable.

XVI. Once the team members are on either side of the case with the tabletop being held over the erected structure, begin to lower the tabletop onto the structure. (Please be patient with this step as BOTH team members must lower the tabletop at the same time in order to have the smoothest installation.)

XVII. As the team members are lowering the tabletop onto the erected structure, it may get caught on one side. The sliders have been given a lead-in chamfer to help prevent this. This is normal and as such requires minor adjustment by raising the sides that have been lowered too quickly and making sure the tabletop is lowered in a level manner.

XVIII. Once the tabletop is successfully placed on the erected structure and set to the correct height, have the team members tighten the 4 circular handles on the tabletop slider to

hold the tabletop in place. (This step is highly recommended for the safety of the user regardless of the steel pins placed below the sliders.)

XIX. At this step it is advised to look at the bubble levels glued on the tabletop to ensure it is level and to check the tightness of all handles to fully ensure the safety of the user. All adjustments to the simulator mounts should be made prior to mounting the simulator.

XX. At this step, it is safe to mount the simulator to the simulator mount.

Seat Setup Instructions:

These are the steps to setup our seat:

I. Starting with the cases being closed, begin with undoing the 8 latches that hold the lid closed.

II. With the lid unlatched, fully open the lid. It should be sitting straight up when it's fully opened. The seat and its swivel are initially separate from the base frame.

III. Lift the base frame of the seat out of the case.

IV. There are four extrusions on the base frame which are used to secure the seat; secure the seat to the base frame at the desired height by placing the 4 pins align vertically and horizontally from each other.

V. Once the seat height is secured, set the desired distance of the seat structure to the simulator mount structure by placing the front-end corner of the seat structure align with preset colored tape that is on the simulator mount case.

VI. Once the desired distance of the seat structure to the simulator mount structure is set, secure the desired forward and backward distance of the seat structure with 2 pins that will be placed on the two back linear motion slider.

VII. Once the desire vertical and horizontal distance of the seat structure is set, connect the seat with the swivel base by sliding the top portion of the swivel into the bottom portion of the swivel. Once it fits, secure the lateral distance by turning the nob of the linear brake handle clockwise.

VIII. When the desired lateral adjustments have been made, the angular orientation of the seat can be adjusted via another lever on the swivel that can be locked in place every 45 degrees increments or free swivel to the desire position. NOTE: Angular adjustment can only be accomplished while the person is sitting on the seat.

Simulator Disassembly Instructions:

I. Using the team lift strategy, remove the simulator from the simulator mount and store it in its case.

II. Rotate the locking mechanism on each of the four linear sliders counterclockwise to loosen them.

III. Using the team lift strategy, with one person on each side of the tabletop, lift the tabletop up to remove it and gently set it down out of the way.

IV. Remove the pins from their slots.

V. Rotate the locking mechanism on one of the 180-degree pivots counterclockwise to loosen it.

VI. Rotate the locking mechanism on the 90-degree pivots on the same linkage counterclockwise to loosen it.

VII. Holding on to the top of the leg, lightly push down and inwards to have the linkage collapse on itself and fold into the case.

VIII. Repeat the previous three steps for the remaining three linkages.

IX. With all four of the linkages collapsed and folded down into the case, rotate all eight of the locking mechanisms clockwise to tighten them.

X. Using the team lift strategy, lift the tabletop up and gently set it in the case on top of the base.

XI. Close the lid and engage the eight latches to keep the lid closed.

Seat Disassembly Instructions:

These are the steps to disassemble the seat:

I. Once the user is finished with their training exercises, stand up from the sitting position.

II. While one person holds the seat, the other person removes the pins from the four extrusions used to secure the seat to the base frame.

III. Remove the pins from the sliders, located on both sides of the base frame.

IV. Set the seat aside.

V. While each person stands on opposite sides of the base frame, lift the base frame simultaneously and place into its case.

VI. Once the base frame is in the case, the tabletop for the simulator mount is to be placed on top.

VII. The seat and its swivel will be stored in the case with the simulator parts

General Notes for Optimal Use:

Operation of the Simulator Mount:

Once assembled, the simulator mount allows the height of the simulator to be adjusted between 25 inches and 29 inches. **Always perform height adjustments without the simulator attached.** The following are instructions for adjusting the height of the simulator mount:

- Have one team member holding the tabletop to support its weight until height adjustment is complete.
- Have the other team member rotate the locking mechanism of each of the four linear sliders counterclockwise to loosen them.
- Remove the pins under the linear sliders.
- Lift or lower the tabletop to the desired height.
- Rotate the locking mechanism of each of the four linear sliders clockwise to tighten them securely.
- Insert the pins under each of the linear sliders.
- The height adjustment is now complete, and the simulator can be attached.

Final Notes for the Project:

Due to the unplanned closure of working environments such as the senior design lab and the machine shop due to COVID-19, some parts were not purchased and/or installed. The parts being referenced are items for the seat design. The prototype currently achieves all necessary functions in its current state and adding the missing parts will complete the seat design and achieve the high fidelity the product was designed for. The team assembled the prototype using material found in the senior design lab and purchased material. Below is the bill of material for the

project in hyperlink form.

https://adminmyfsu.sharepoint.com/sites/seniordesigngroup515/Shared%20Documents/BOM.xlsx

Prototype Design Inconvenience

The initial design used lightweight smooth 1515-80 series for all the bars to ensure that the design meets the weight requirements, however; the current design uses a mixture of the light and heavyweight series due to being borderline with the budget.