LAPPD Support Structure Fit Test

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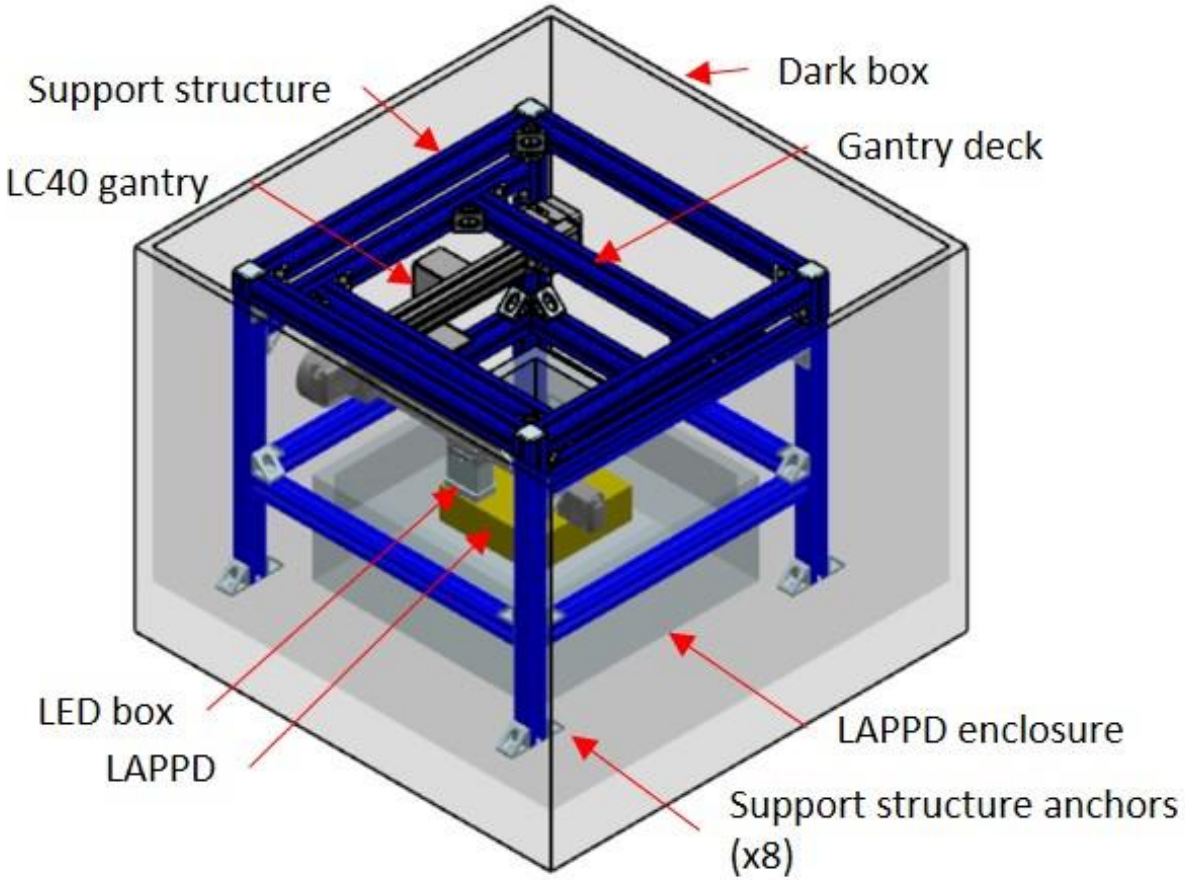
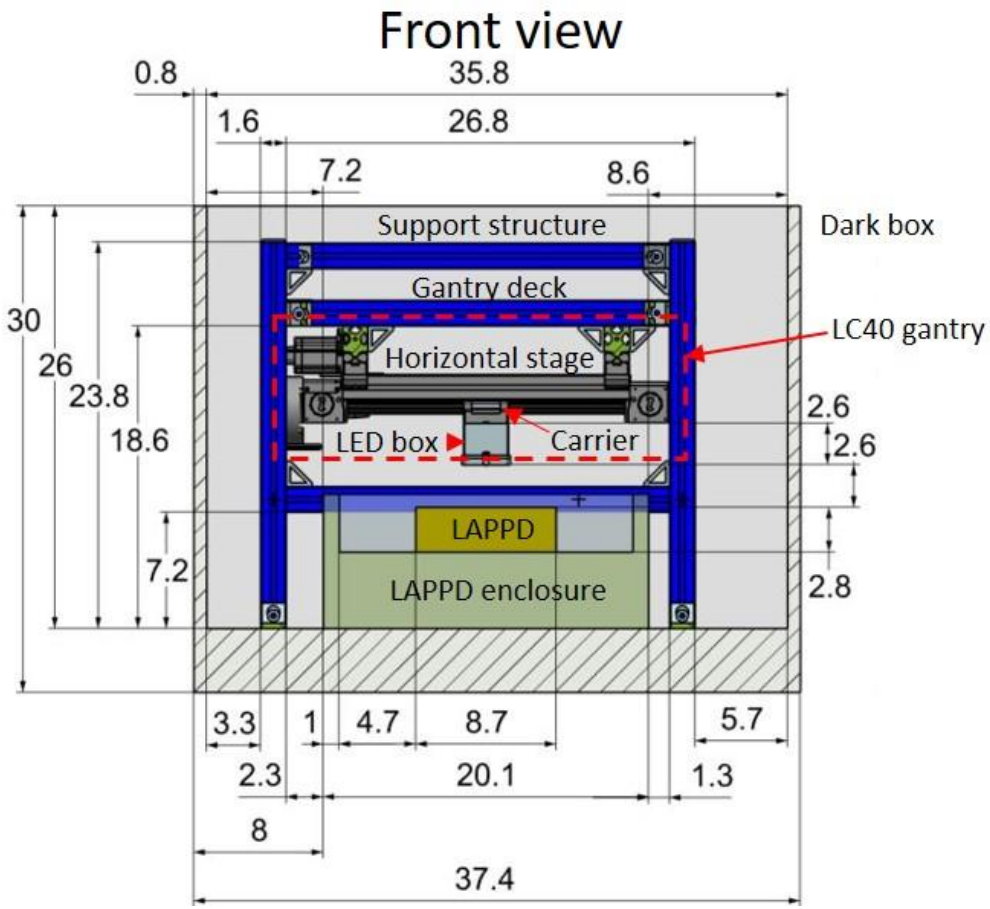
Support Structure Model (Isoview)



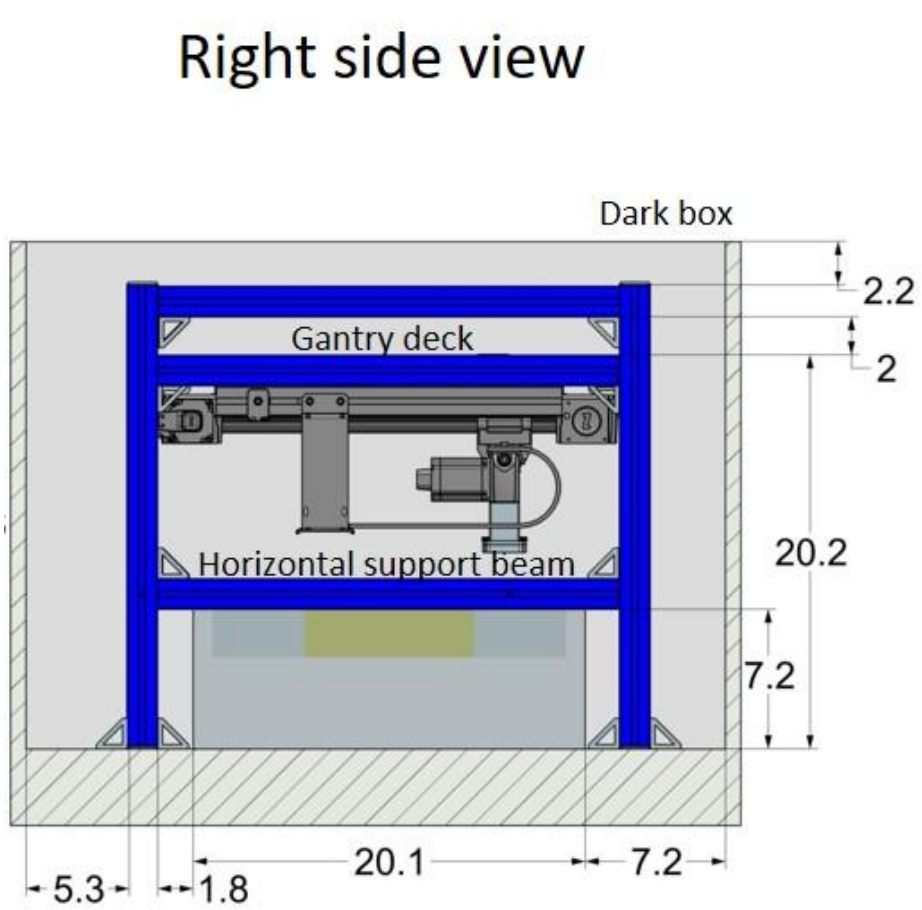
- A support structure needed to be developed to position the LC40 gantry over the LAPPD detector
- The support structure design uses sixteen 40-mm aluminum extrudes fastened together with corner gussets
- A model of the support structure was developed in NX12 to help with the development of the support structure

Support Structure Model (Front View)



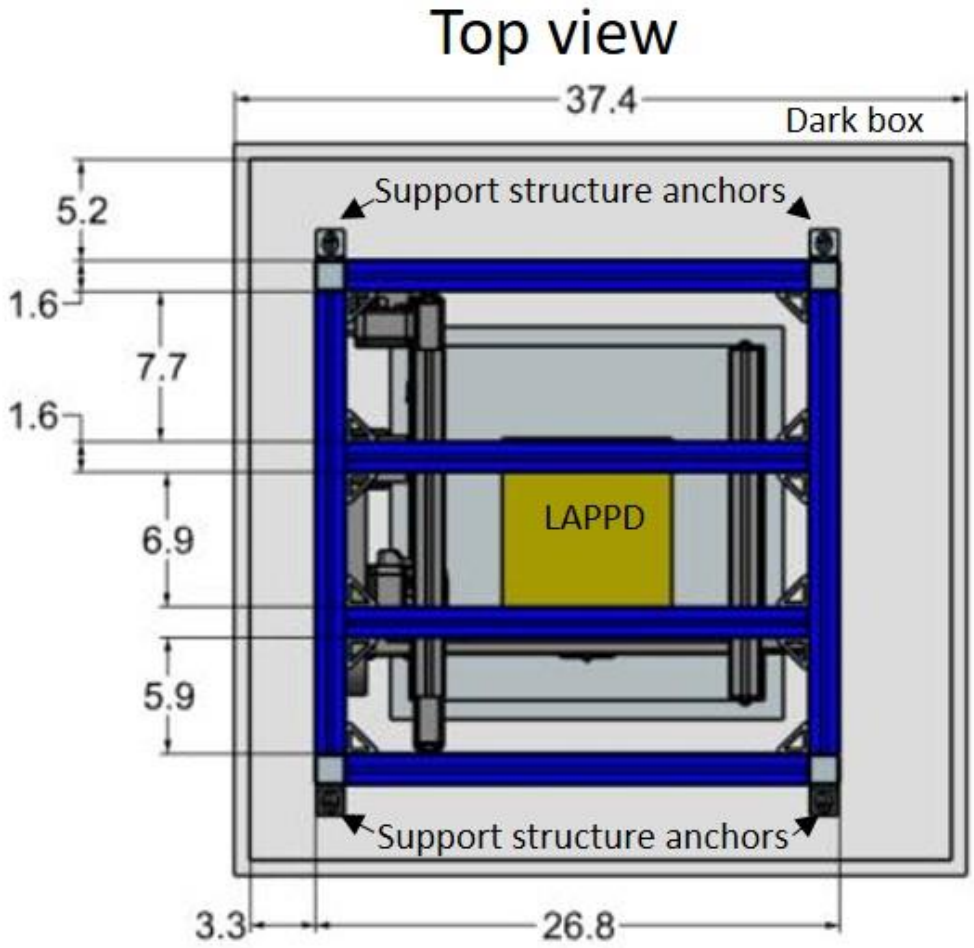
- The front view shows that the overall interior height of the dark box is 2.2” taller than the support structure
- The gantry deck is a section of the support structure that the LC40 gantry hangs from
- The LED box is mounted to the LC40 gantry carrier, which moves the LED box from left to right in this drawing
- The horizontal stage, which holds the carrier, moves in *Z* with respect to this drawing

Support Structure Model (Right Side View)



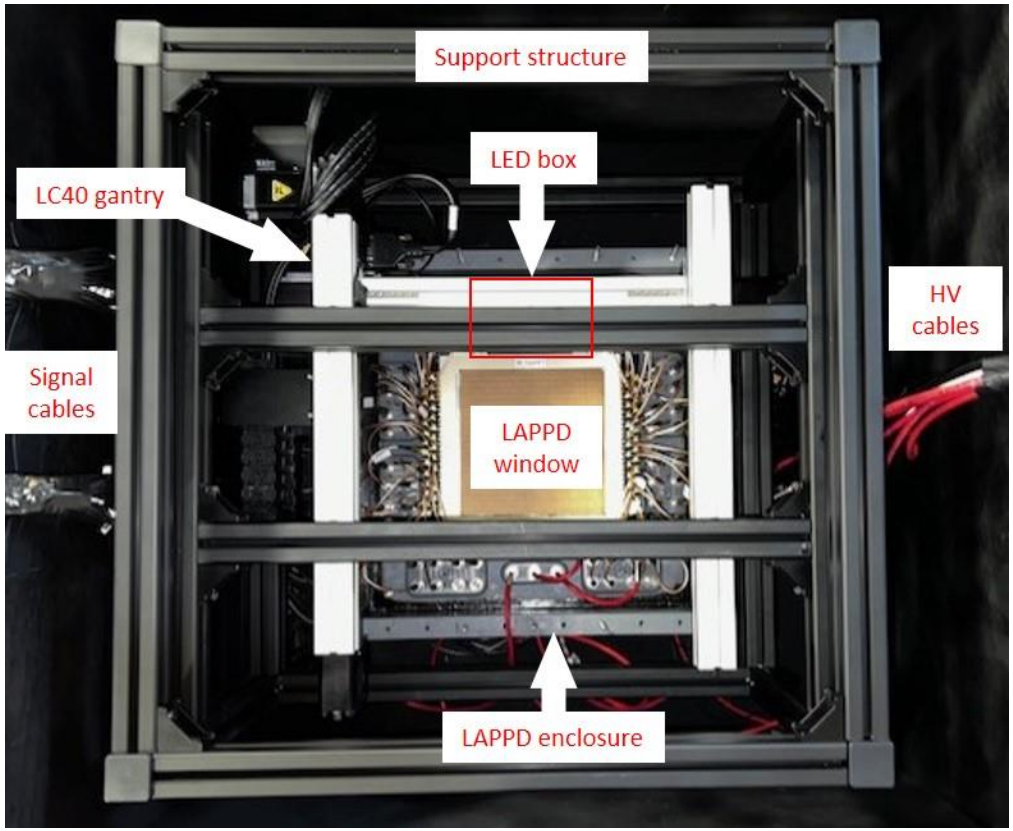
- A horizontal support beam is mounted on each side of the support structure, approximately 7” from the bottom of the support structure
  - This height allows high voltage and signal cables to pass under the support structure

Support Structure Model (Top View)



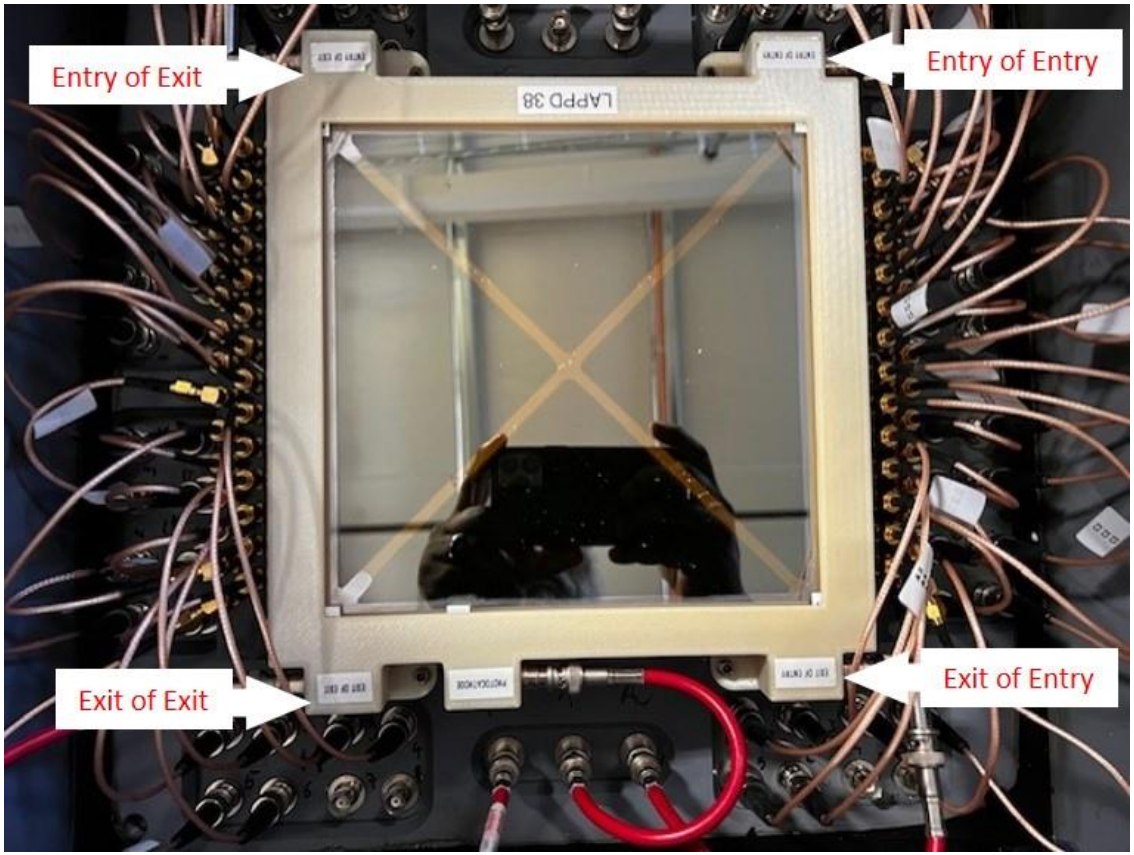
- Each vertical extrude has two gussets on the bottom (inside anchor gusset view obscured by the structure) that are used as anchor points to screw the structure to the dark box floor

Support Structure Overview



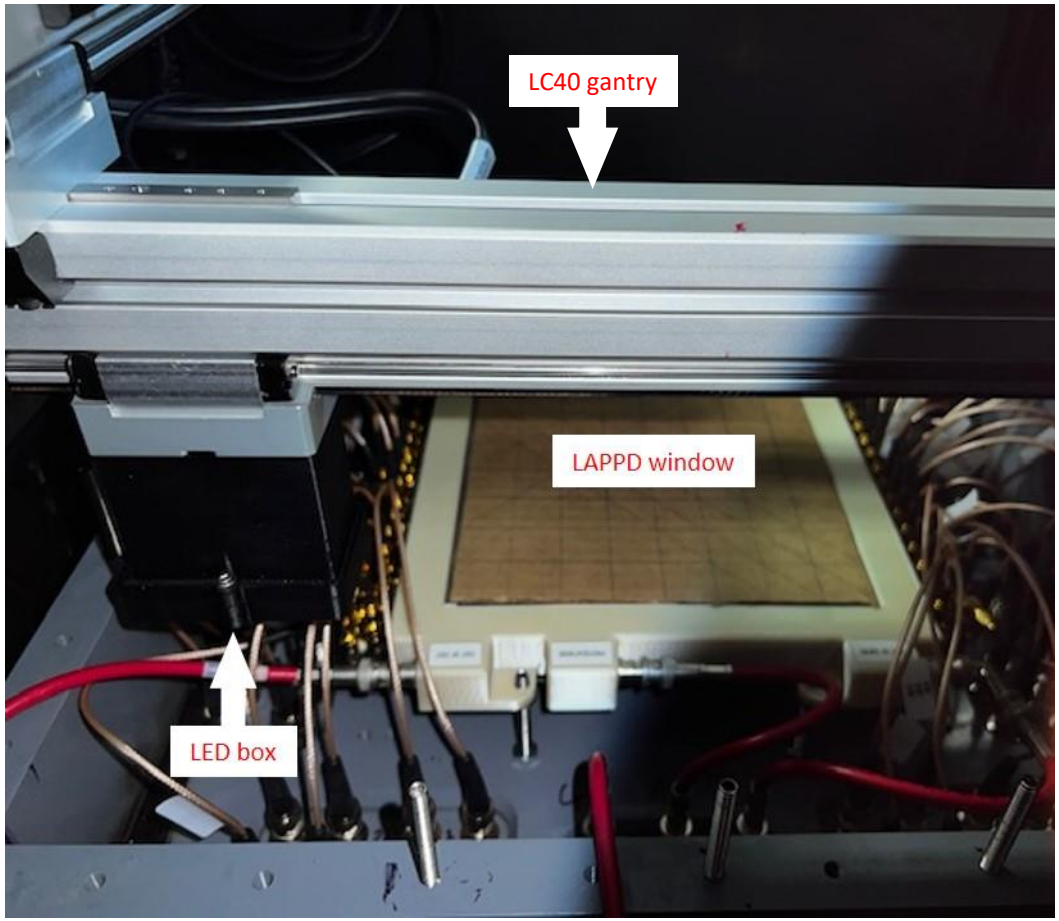
- An overview of the interior of the dark box shows all major components of the LAPPD test stand and support structure
- The support structure is positioned so that the center of the travel range of the LED box can be positioned to cover the entire LAPPD window

LAPPD Window Location Names



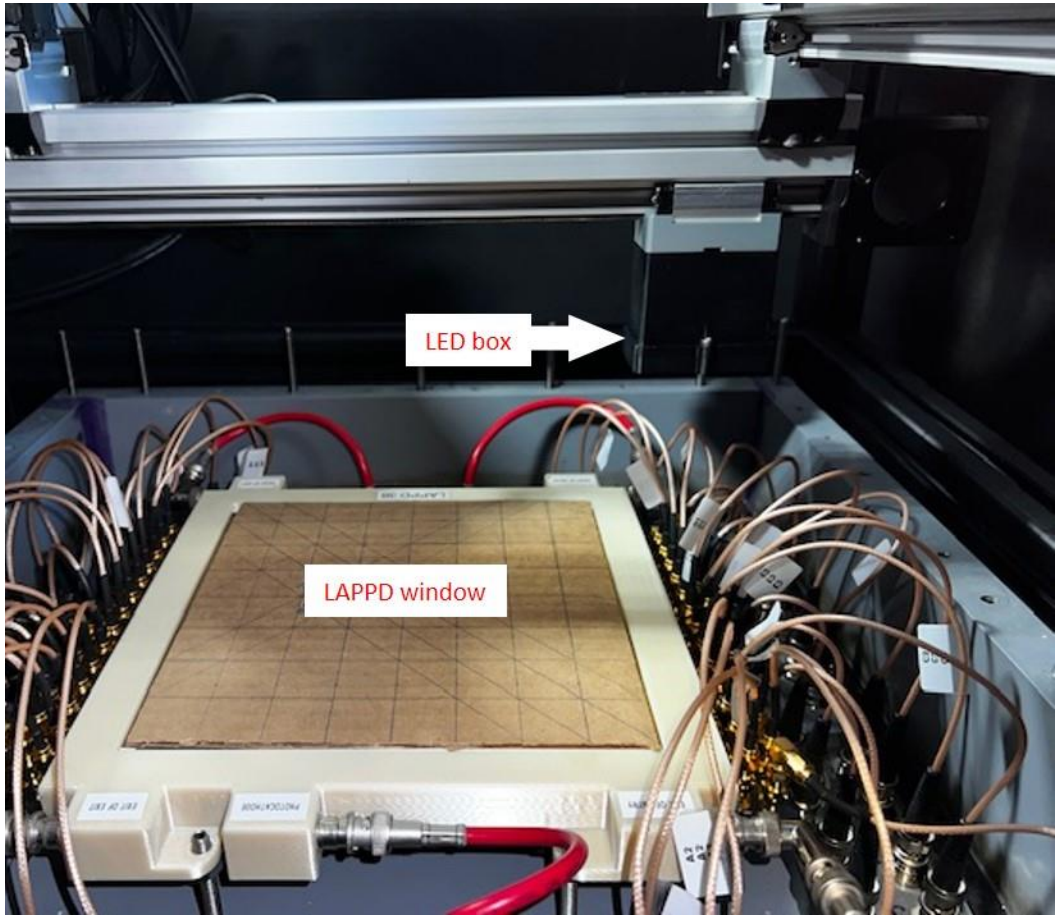
- Each corner of the LAPPD window has a location label
  - Entry of Exit
  - Entry of Entry
  - Exit of Exit
  - Exit of Entry
- These locations were used as measurement points to check the vertical distance of the LED box to the window (*Z*)

LED Box Clearance (Front–left)



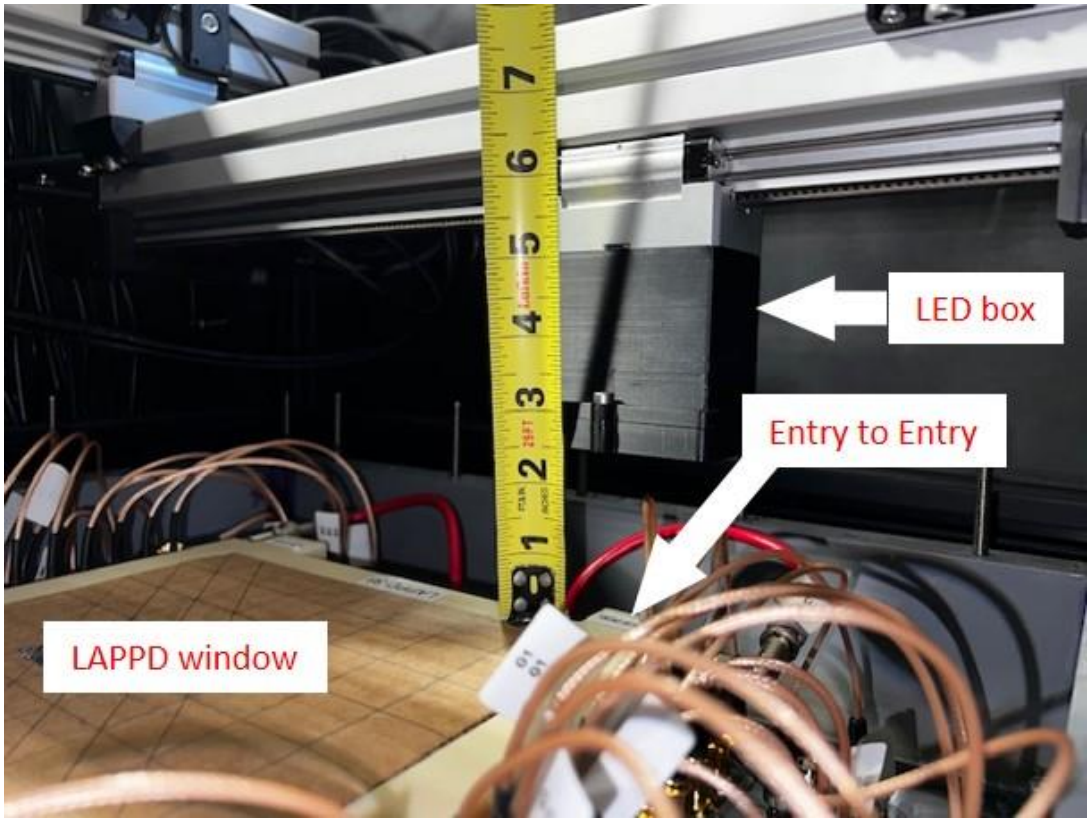
- The LED box was moved to the extreme front–left corner to ensure total window coverage in that direction

LED Box Clearance (Back-right)



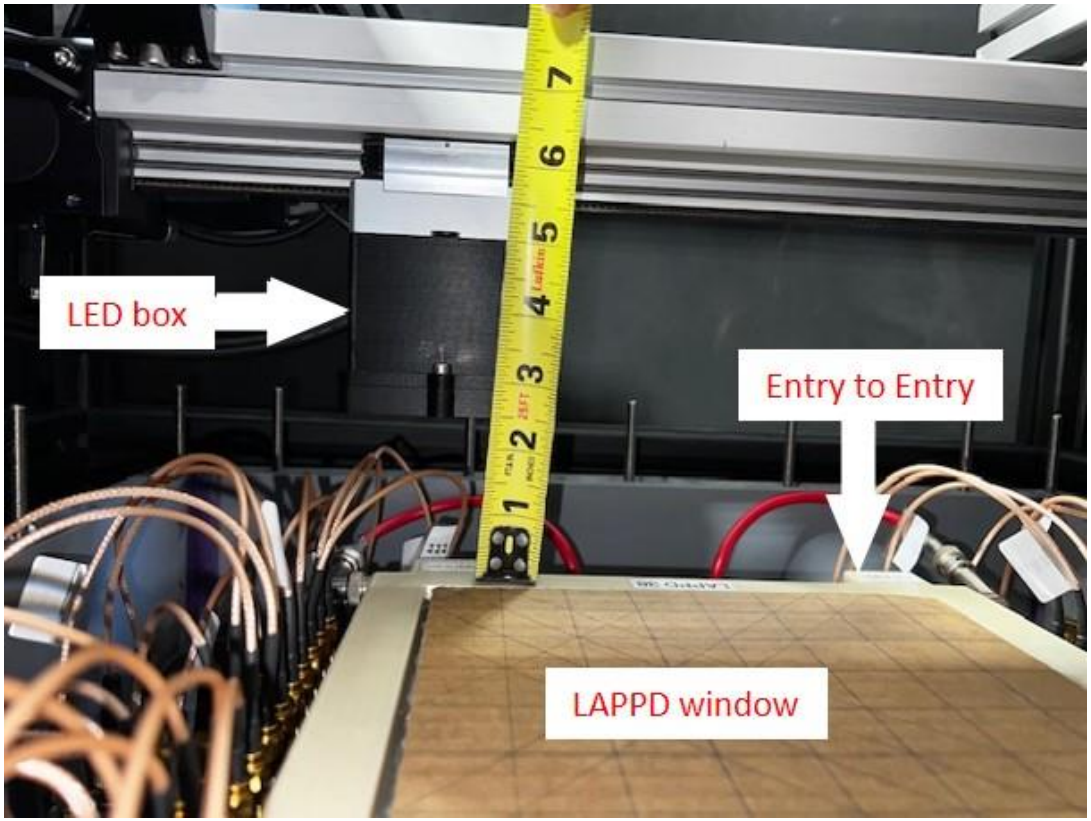
- Next the LED box was moved to the extreme back–right location, verifying that the entire window area is covered by the LED travel

LED Box Clearance (Vertical: Entry to Entry)



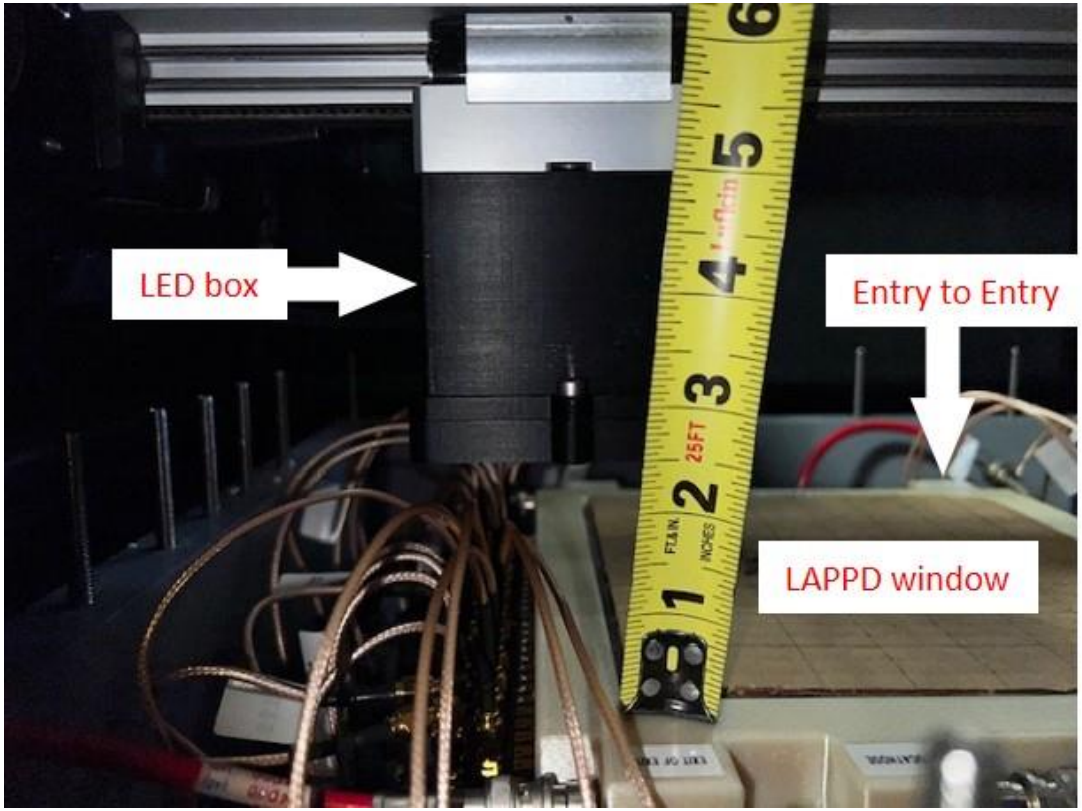
- The vertical distance measurement at Entry to Entry is ~2.5”

LED Box Clearance (Vertical: Entry to Exit)



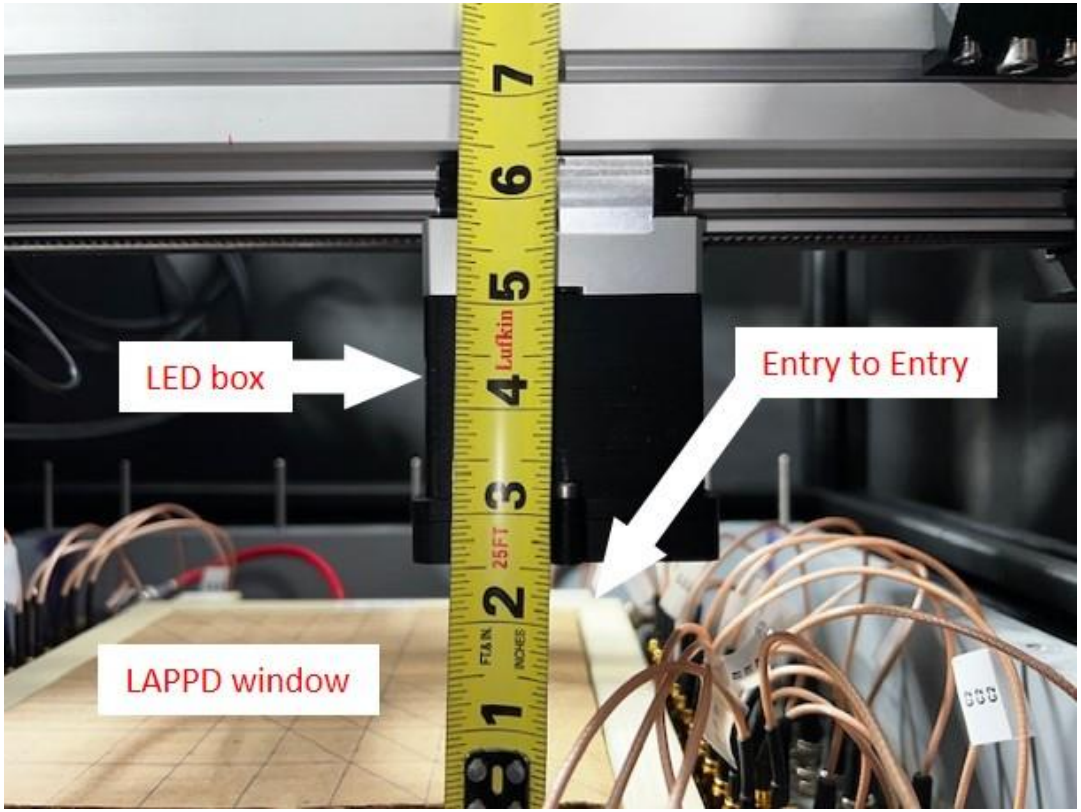
- The vertical distance measurement at Entry to Exit is ~2.5”

LED Box Clearance (Vertical: Exit to Exit)



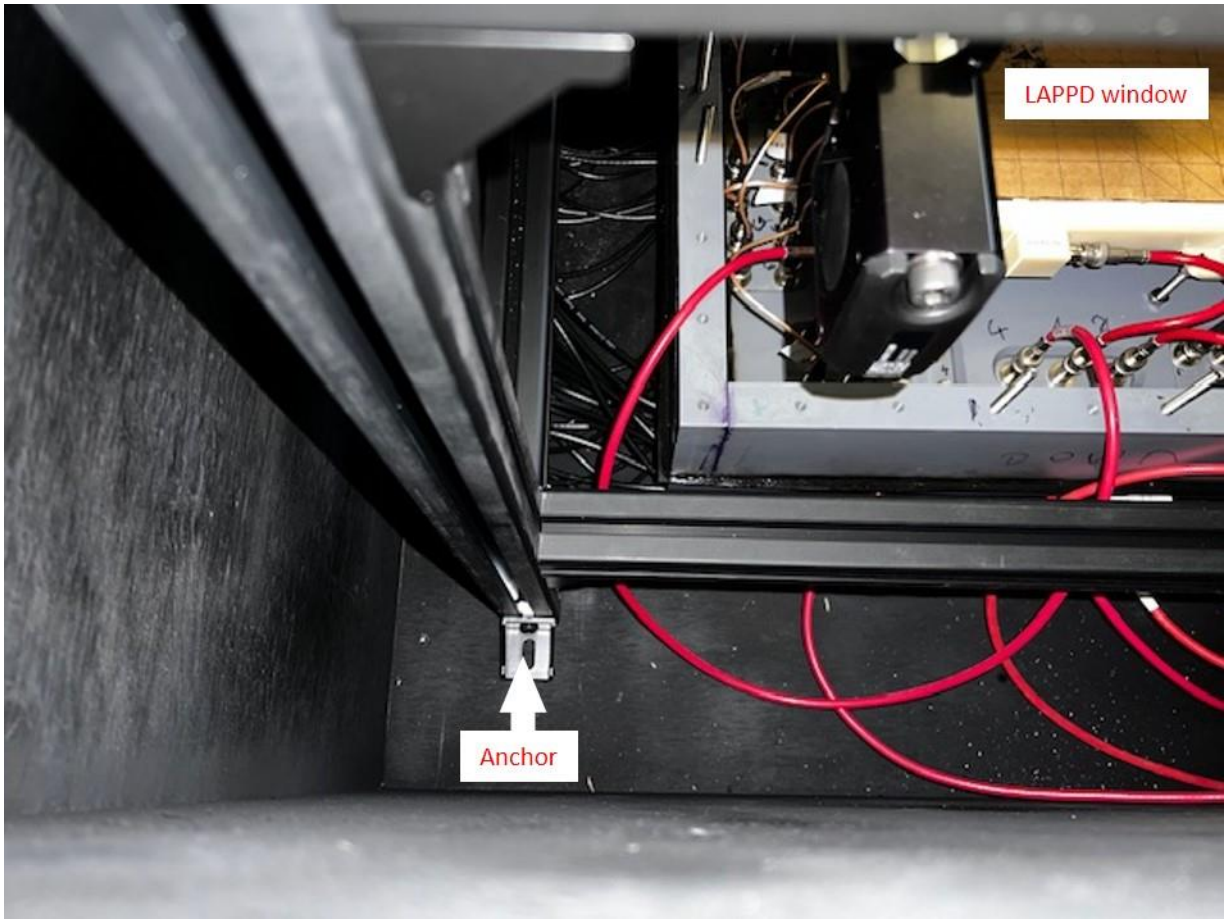
- The vertical distance measurement at Exit to Exit is ~2.6”

LED Box Clearance (Vertical: Exit to Entry)



- The vertical distance measurement at Exit to Entry is ~2.6”

Support Structure Anchors



- During final installation, the anchor points will be fastened to the dark box with wood screws at all the vertical extrusions

Conclusion

- DSG developed a model of a support structure to mount the LC40 gantry, which will position an LED box above all locations of the LAPPD window
- The model was used to build the support structure to the design specifications
- A fit test was completed
  - The support structure fits
  - The LED will completely cover the LAPPD window
  - The LED box is 2.5–2.6” from the surface of the window in all corners

Thank You