

# DUNE FD VD

## Field Cage Module Assembly Guide

Gajendra Gurung on behalf of UTA HV Team

Brad Brown, Samuel Blanchard, Akash Behanan & Rohit Raut



THE UNIVERSITY OF TEXAS  
AT ARLINGTON



DEEP UNDERGROUND  
NEUTRINO EXPERIMENT

# Required Tools and Parts



- Torque Screwdriver (M2.5 bit, 30cN-m)
- Screw, lock washer and flat washer
  - M3 x 12mm for profile mounting, M3 x 8mm for divider board mounting
- Right size Al profiles bent or not depending on the module to be assembled
- Box Beams
- Optical Fiber Conduits
  - Rivet-nuts, M6 countersunk screws (if needed)
- Divider boards
- Slipnuts
- End caps and their rivets
- G10 Alignment Strips
- G10 sheets for bent modules
  - #8-32 screws, lock washer, flat washer, brass square nut used for mounting



# Step 1: Align the Teeth



- Use profiles and slip-nuts, picking random positions on the top, bottom, and middle to see if the slip-nuts holes align with the box beam holes.
- Remove the box beams from the assembly table.



# Step 2: Insert Slip-Nuts into the Al Profile & place them Assembly Table



- Visual QC of profiles
- Insert slip-nuts of the correct kind in the correct order
- Place it on the Assembly Station

Done in 3 stages: Ground level, Stairs and Scaffolding



# Step 3: Place the Right Box Beams on the Assembly Table



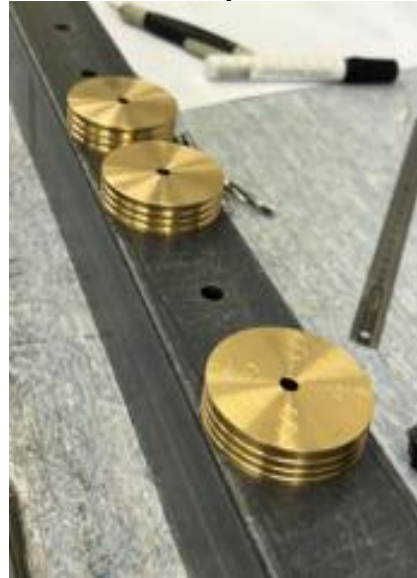
- Position the box beams on the assembly table; if the beam has a conduit, ensure that the threaded inserts face each other on the inside face of the beams.
- Top box beams should have their cutout on the top of the assembly table
- Bottom box beams should have their cutout on the bottom of the assembly table



# Step 4: Attach the Aluminum Profiles to the Box Beams



- Screw in the slip-nuts until driver clicks with the right size screws (M3x12mm) to attach the aluminum profiles to the box beams



# Step 6: Attach the Divider Boards



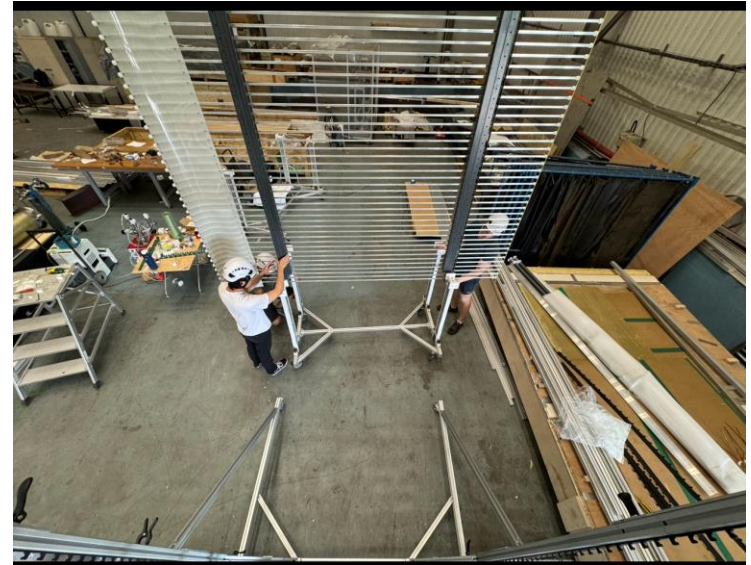
- Attach the divider boards to the profiles with the component side facing away from the beam, overlapping boards on every 9th profile.
- For top modules, the top board is a termination board mounted flat
  - This requires normal slipnuts instead of combo



# Step : Attach G10 Sheet



- Use #8-32 screws and brass square nuts to mount the sheet, overlapping the first and last holes between sheets





# Step 7: Place End Caps and Alignment Strips



- Insert rivets by hand first, then finish rivet insertion with pliers or channel locks to secure the end caps.
- G10 strips mount to the 3rd hole on the end caps, overlapping live HVDB and G10 sheeting



# Step 8: Mount Optical Fiber Conduits



- Mount optical fiber conduits if necessary



# Step 9: Post-assembly checks



- Ensure all screws are tightened. Inspect the aluminum profile for any damages such as scratches or bending that could have occurred during the assembly process.
- Perform electrical continuity test to ensure all Al profiles are electrically connected with each other.

