Nukit Laminar Cannon

User Manual
June, 2024

The Laminar Cannon is an experimental device for directing a cohesive stream of highly filtered air at an individual in motion. It is not a commercial product.

The Laminar Cannon has two parts: a DIY laminar flow air purifier of Nukit's design and an off-the-shelf face-tracking motorized pan-tilt head, the "Soonpho M6." It's one of several consumer gimbals that seem to be using the same low-cost tracking-on-a-chip hardware.

Deployment:

Charge the motorized pan-tilt head with the included USB Type-C cord.

Once fully charged, attach the motorized pan-tilt head to the included aluminum tripod, ensuring the head is parallel to the floor with the integrated bubble level.

Holding the laminar flow air purifier by it's plastic components, being careful not to crush the filter, attach it to the motorized pan-tilt head with the tripod plate.

Be sure the nozzle is pointed in the same direction as the camera on the front of the motorized pan-tilt head.

Select “Remote” in the front of the motorized pan-tilt head.

Using the wireless remote control included in the box, tilt the motorized head up or down until the laminar flow air purifier is parallel to the floor. You may have to select the correct channel on the remote control.

Adjust the tripod and raise the air purifier until the perforated nozzle is pointed directly at your face, but still parallel to the floor.

Connect the accompanying 12v DC extension cables to the filter, ensuring that the power supply stays flat on the floor- not hanging from the filter. Ideally, use Velcro straps to secure the cables.

Turn the power knob on the back of the air purifier to 2 or 3- you will hear a click. 2-3 is optimal for air purity and flow, but higher can be interesting for demos- if too loud to use normally.

Select “Tracking” in the front of the motorized pan-tilt head.

Standing about two meters in front of the tripod, make the OK 👌 sign. You will see a green light and the head will pan to track you as you walk side to side.

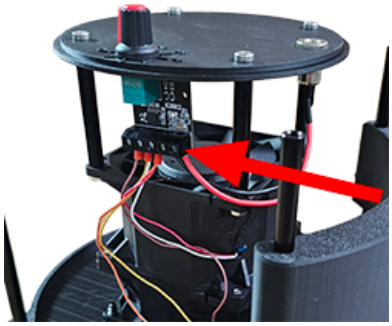
To stop it tracking, make a stop gesture with both hands ✋🤚

Two units should be deployed at right angles to triangulate on a speaker and yield the best possible results in terms of localized filtered air.

Changing Filters and Troubleshooting:

The Laminar Cannon uses easily sourced filters for the Levoit Core 200S, and an GFB0812DHU 80mm server fan with a speed controller.

To change the filter or access the internal components, remove the four thumbscrews on the back of the Laminar Cannon. Then take off the retaining ring.



Any field-repairable problem would most likely occur with the terminal jack on the speed/power controller. Using a small Phillips head screwdriver, ensure all wires are in place and firmly seated.

Notes:

The Soonpho M6 motorized pan-tilt head only pans to auto-track- but it is ideal for showing how far low-cost computer vision has come. When mounted at head height, it has little need to tilt. More expensive but easily sourced gimbals can pan, tilt, and perform simultaneous face recognition and object tracking, to ensure a single subject among several remains the target.

At this point, the localized effect of the Laminar Cannon is still not optimized, but with the right software modeling and higher air flows, it can be significantly improved. This Laminar Cannon is still a proof of concept simply used to demonstrate the potential application of smart, targeted mitigations.