

THUNDER-X

ELECTRIC SKATEBOARD



The first electric skateboard developed in India. Designed, prototyped and tested in-house from 2020 to 2022, **then taken to the global market.**

2

Years
2020 to 2022

8

Prototypes
First mule to pre-production

3

People
One team throughout

2

Patents filed (USA)
Unique drivetrain system

2

Countries
Designed in India, made in China

6

Systems
Developed in-house

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An electric skateboard built in India to compete with **the best boards from the US and Europe.**

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|----|---------------|---|
| 01 | BENCHMARK | Targets for power, range, weight and ride quality were set against the leading boards before any part was drawn. |
| 02 | DESIGN | Drive, motors, controller, battery and enclosures were designed in-house as one system, not bought as a kit. |
| 03 | PROTOTYPE | Each build was ridden, taken apart and revised before the next one was made. |
| 04 | TEST | Every version was ridden in city traffic and run on a race track. |
| 05 | INDUSTRIALIZE | Suppliers, tooling, contract assembly, packaging and logistics were set up in China, ready for volume production. |



BOARD SPECS

PERFORMANCE

50 KM/H

Top speed

Rider and road permitting

40 KM

Range

On one charge

3 KW

Peak power

Two motors combined

8 KG

Weight

Ready to ride

MECHANICAL

DECK (COMPOSITE) **Bamboo, fiberglass and maple**

TRUCKS (AXLE) **Paris V3**

DRIVETRAIN **Dual belt drive**

WHEELS **Street or foam-core**

ELECTRICAL

MOTORS **Dual outrunner**

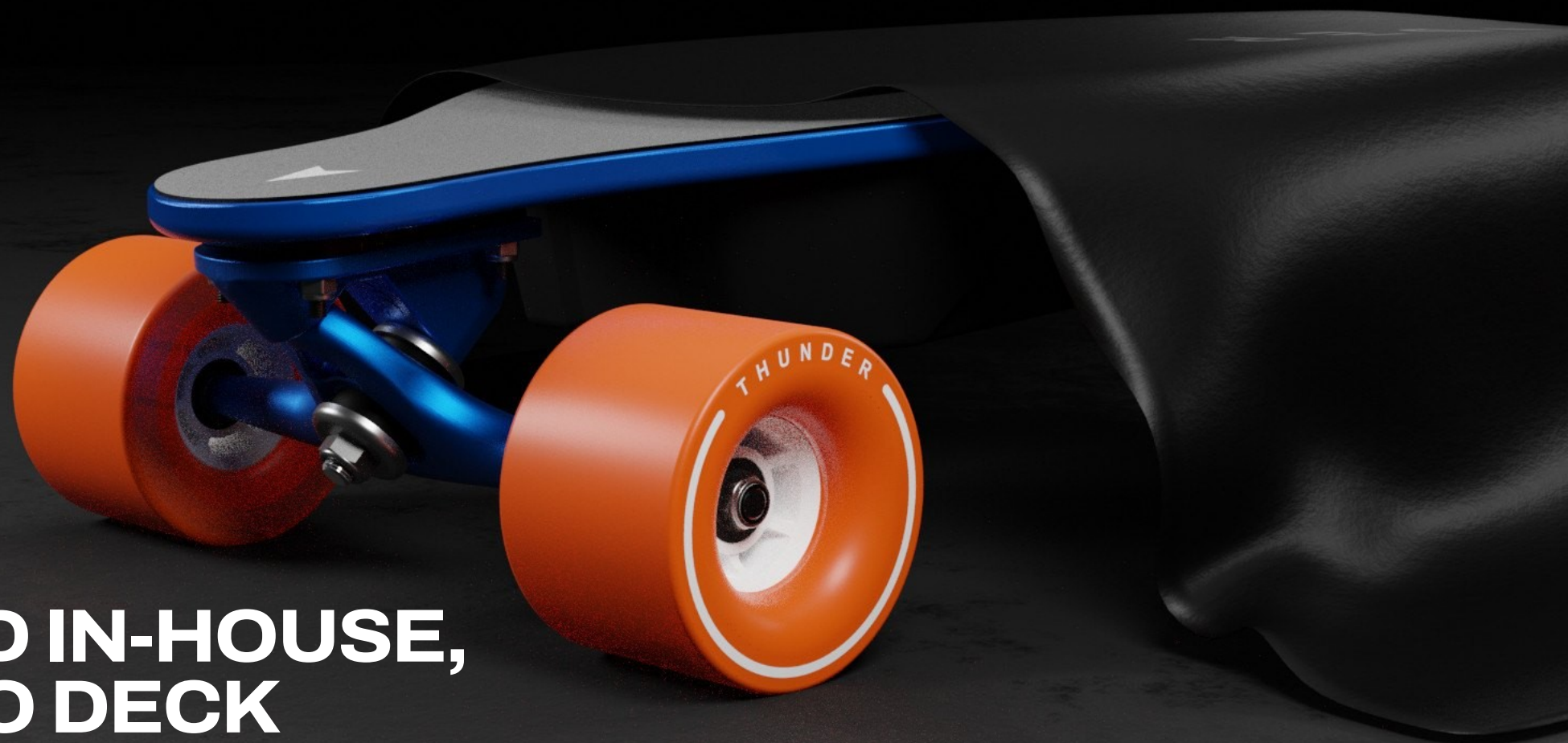
CONTROLLER **Dual VESC-based**

BATTERY **Li-ion, two configs**

REMOTE **2.4 GHz, with display**



965 L · 38 IN



**DESIGNED IN-HOUSE,
MOTOR TO DECK**

A THREE-LAYER COMPOSITE DECK

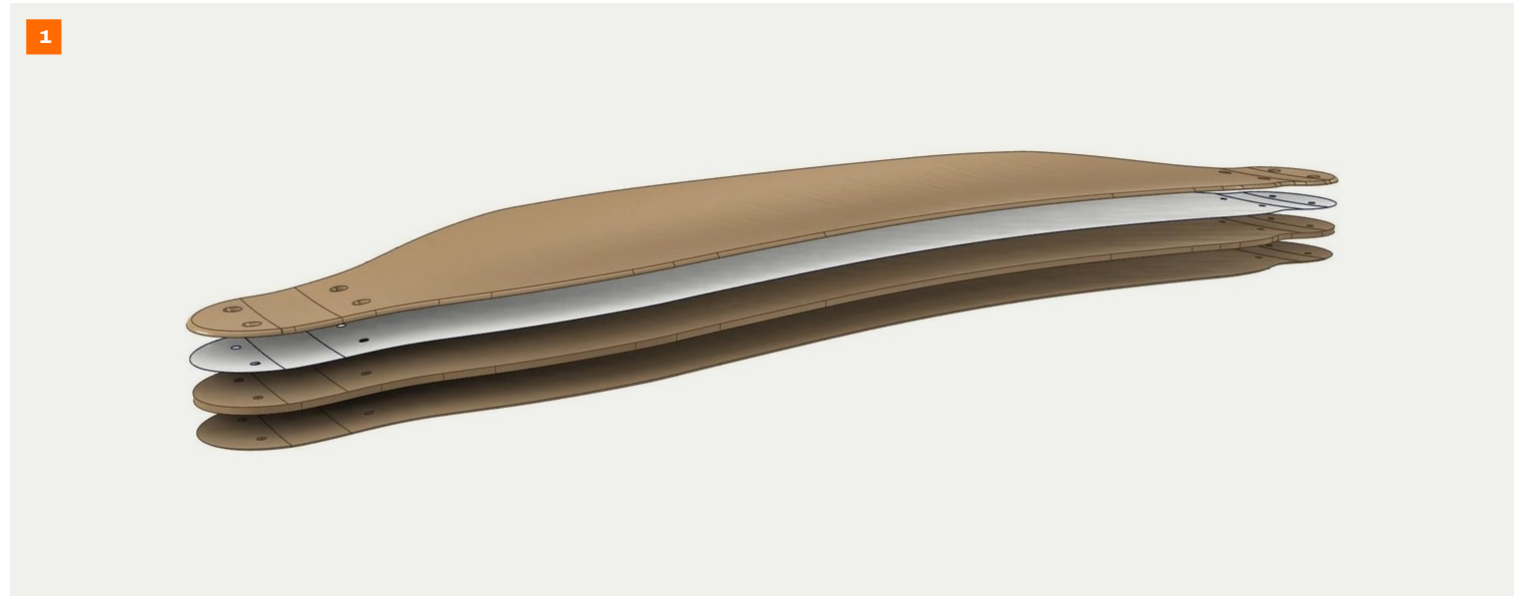
The deck is pressed from a bamboo core, triaxial fiberglass and Canadian maple. The bamboo keeps it light, the glass carries load in three directions and the maple adds stiffness. A gentle camber lets it flex over rough roads and return to shape.



1 Composite layup, exploded

2 Isometric view

3 Camber G2 surfacing



A DRIVE FOR THE PARIS V3

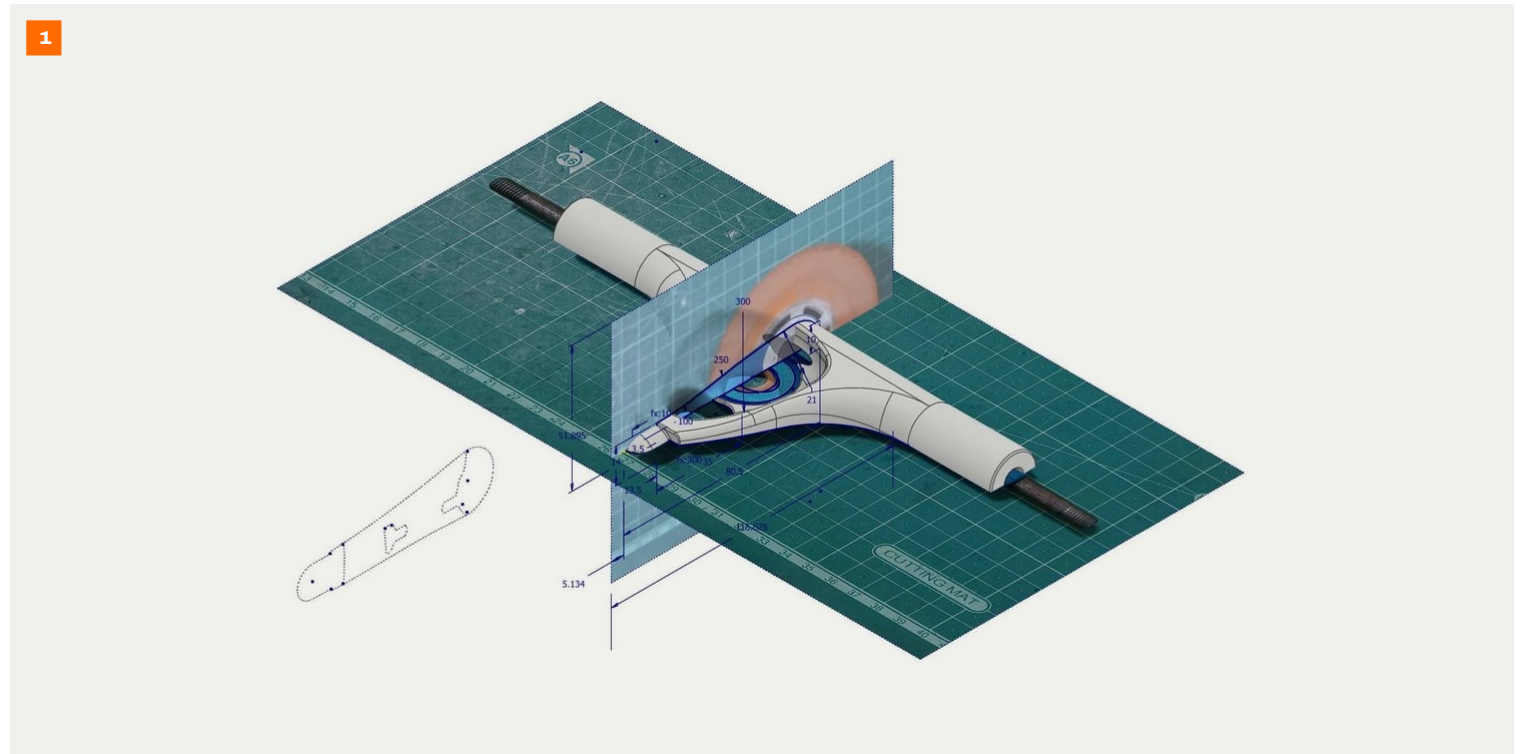
The Paris V3 is a street truck loved by skaters around the world, but no electric drive existed for it. We brought the idea to life in partnership with Paris, developing our own mounting design to adapt it to an electric drivetrain.

1 Truck rebuilt from photographs

2 Hanger, front view

3 Baseplate and pivot

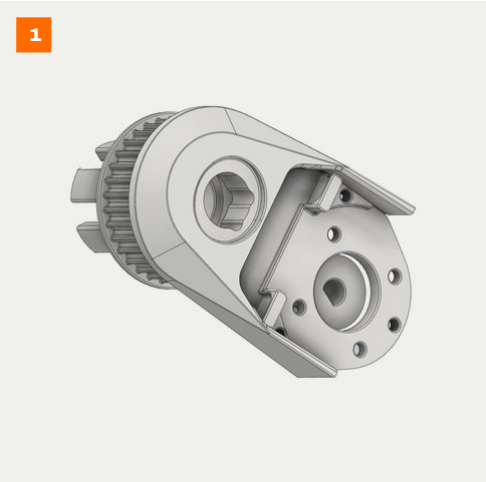
4 Drive mounted on the hanger



MACHINED FROM SOLID 6061

Every drivetrain part is CNC machined from 6061 aluminum and matt anodized. A spring-loaded tensioner keeps the belts at a steady tension as they bed in and wear, so they never need re-tensioning by hand. The drivetrain, tensioner included, was filed for patent in the USA, the biggest market.

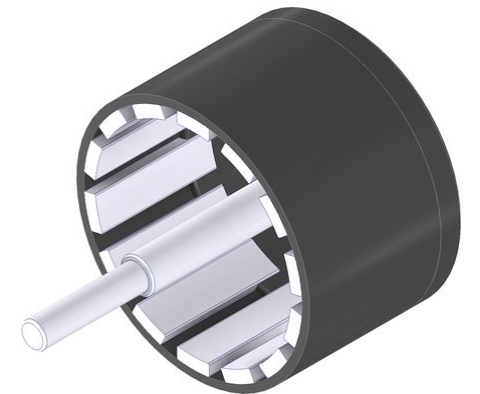
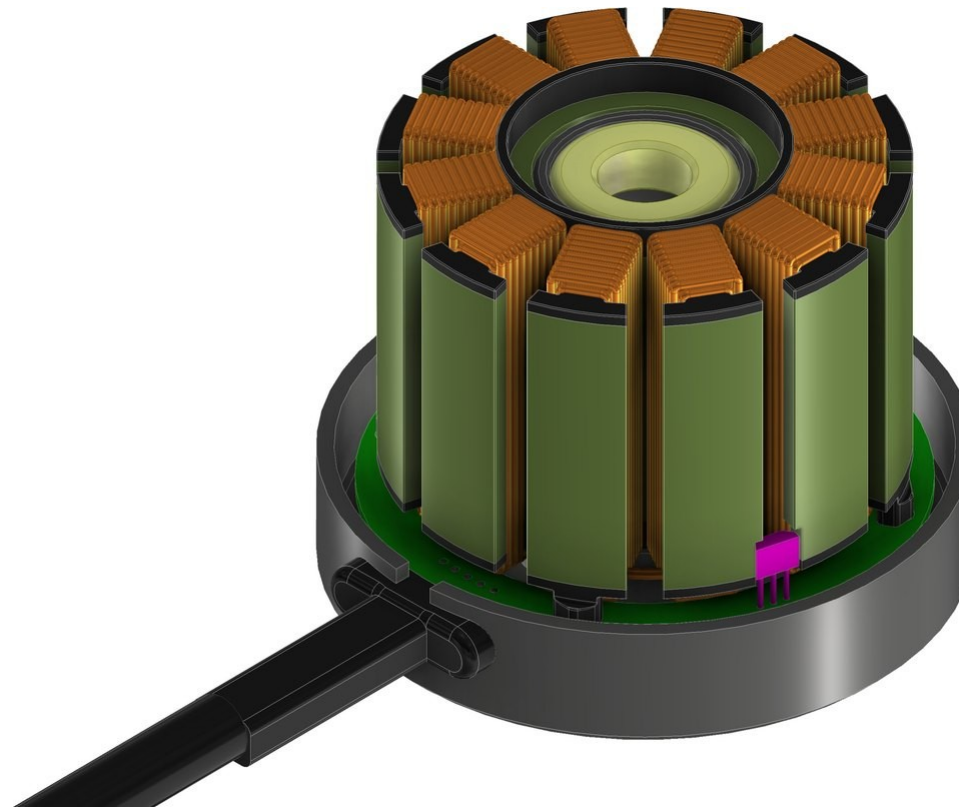
- 1 Motor mount with wheel pulley
- 2 Wheel and motor pulleys
- 3 Motor mount bracket
- 4 Machined parts from the shop
- 5 Pre-production drive



MOTORS THAT STAND OUT

An unconventional 5550-size outrunner, designed and built with one of the most specialized Chinese motor makers. Each motor is wound to 170 KV for 7,000 RPM, gives 1,500 W peak and is rated to run at 120 °C on long climbs. Hall sensors give smooth feedback from a standstill and precise temperature readings. Top-tier mechanical design meets top-tier Chinese electrical expertise: the highest-grade magnets and windings, the thinnest laminations, and an integrated PCB that leaves more room for the stator.

- Copper windings
- Stator core
- Hall sensor board
- Hall sensors
- Rotor can and magnets
- Phase and sensor lead



TWO PACK LAYOUTS

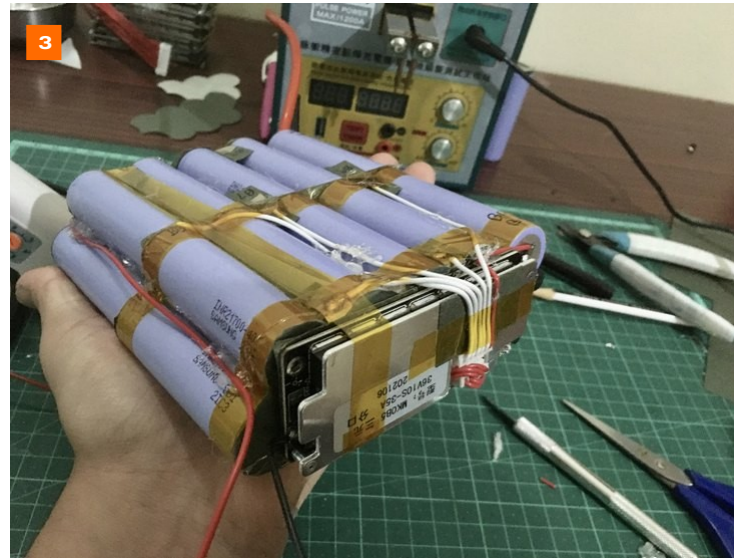
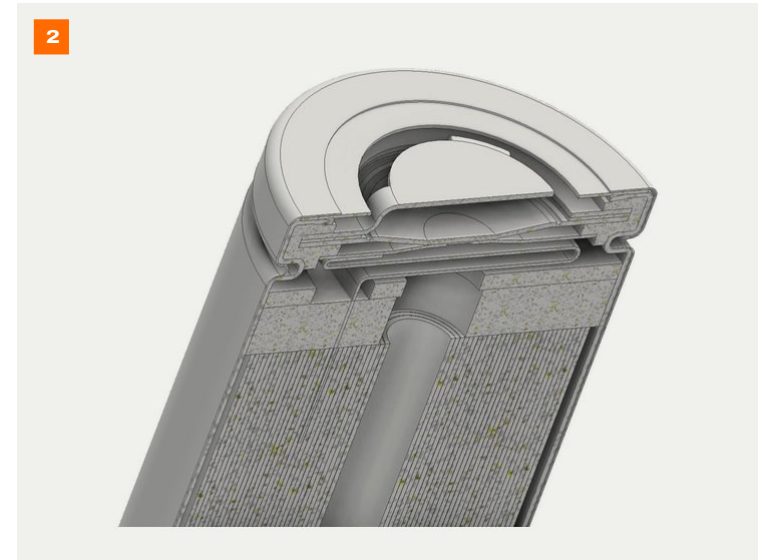
The packs used Molicel P42A 21700 cells, in a 10s3p layout at 36 V or a 12s3p layout at 43 V. The cells allow 10C peak discharge and 1C charging. Each pack was designed around its enclosure, then built and tested in-house to take heavy vibration and deck loads, and to hold its voltage under load for non-stop riding.

1 Pack layout

2 21700 cell, sectioned

3 Early pack iteration

4 Pack fully enclosed and mounted



UNIFIED CONTROLLER

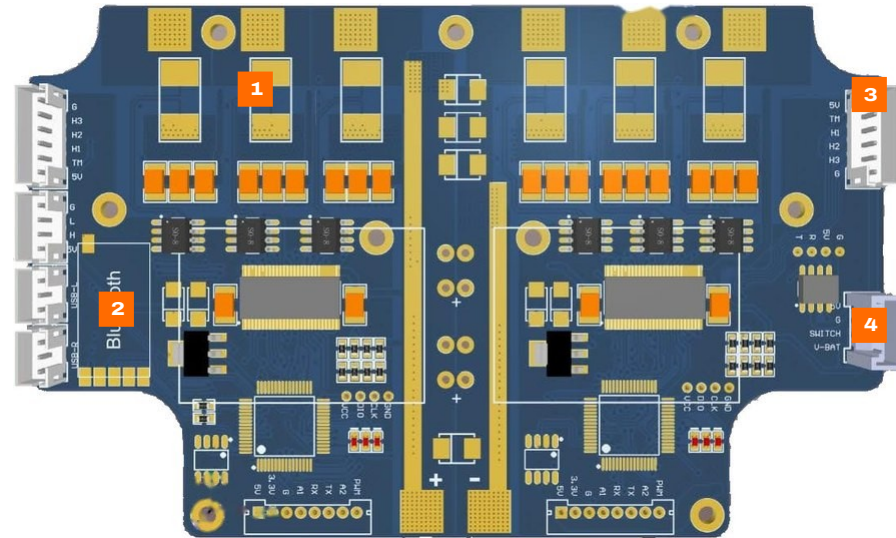
A dual-channel speed controller based on the open-source VESC 6.6 design, engineered with a Chinese manufacturer. It drives both motors at up to 50 V and 100 A, and its Bluetooth module lets riders tune and monitor the board from a phone app. The fully programmable architecture can tune every aspect of the ride. After a few blown FETs and firmware glitches, we got it right.

1 Dual CANBUS motor channels

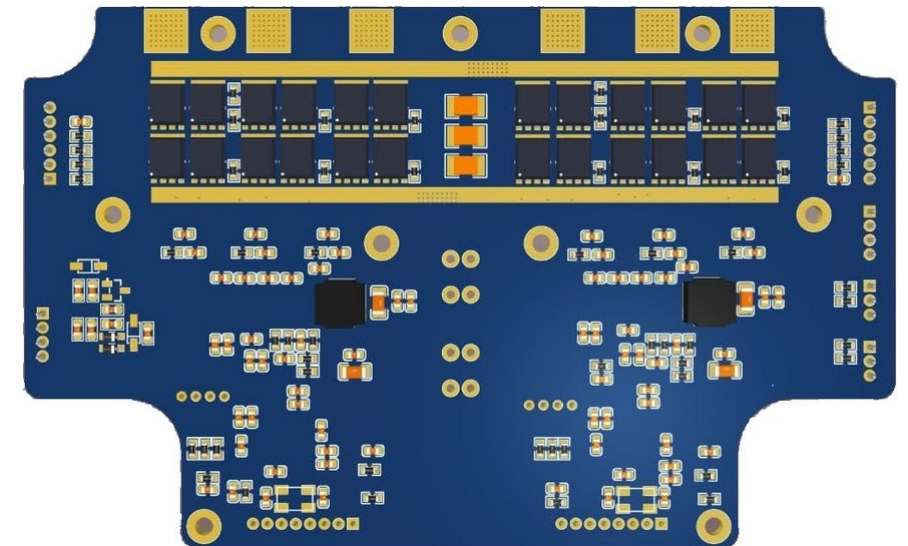
2 Bluetooth module

3 Hall and temperature inputs

4 Power switch and battery input



01 TOP SIDE



02 BOTTOM SIDE

ENCLOSURES THAT TAKE THE HIT

The battery and the electronics sit in two separate shells under the deck, which leaves the middle of the deck free to flex. Each shell went through several design rounds, made by 3D printing and vacuum casting for low-volume batches.

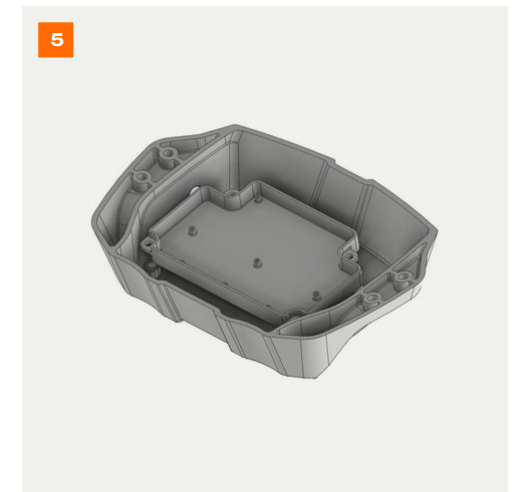
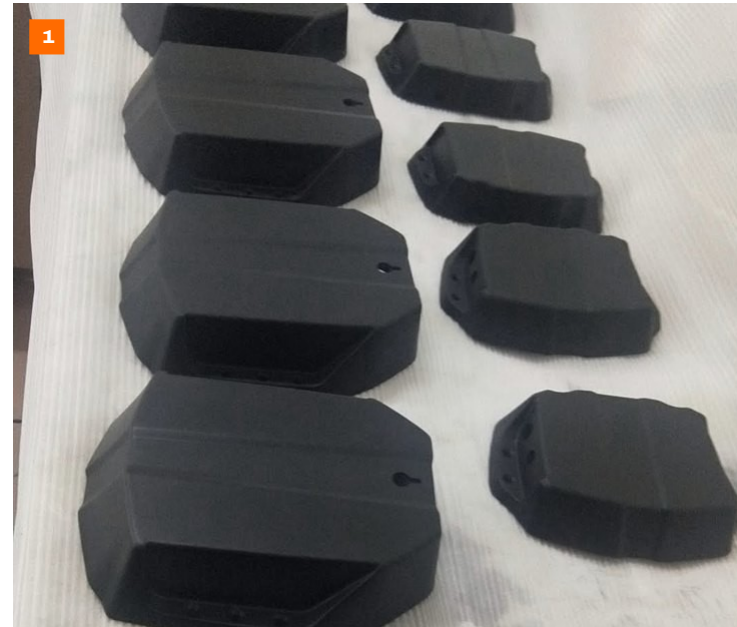
1 Shell iterations

2 Both shells on a finished board

3 Shell, outside

4 Shell, inside

5 Shell with electronics tray



WHEELS AND REMOTE

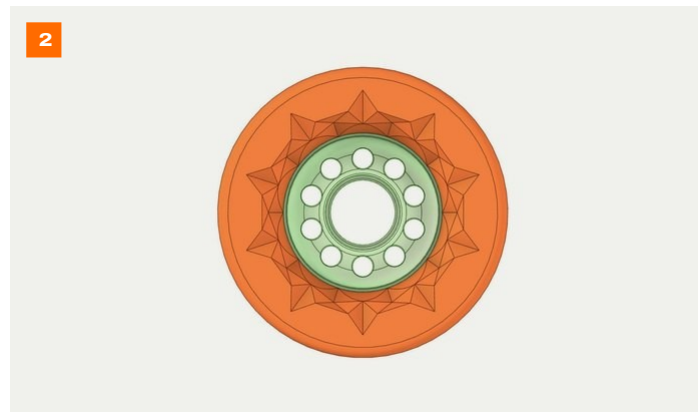
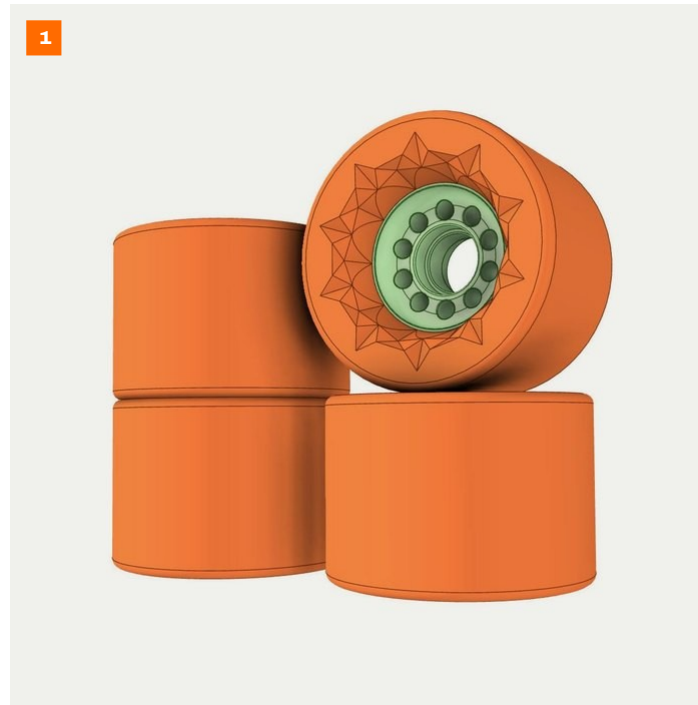
The street wheels are 90 × 60 mm in 78A urethane, with a Cloudwheels 105 mm foam-core option for broken roads and light trails. The remote is a proven commercial unit, so design time went into the drive, motors and electronics instead.



1 Street wheels

2 Wheel core and face

3 Display remote

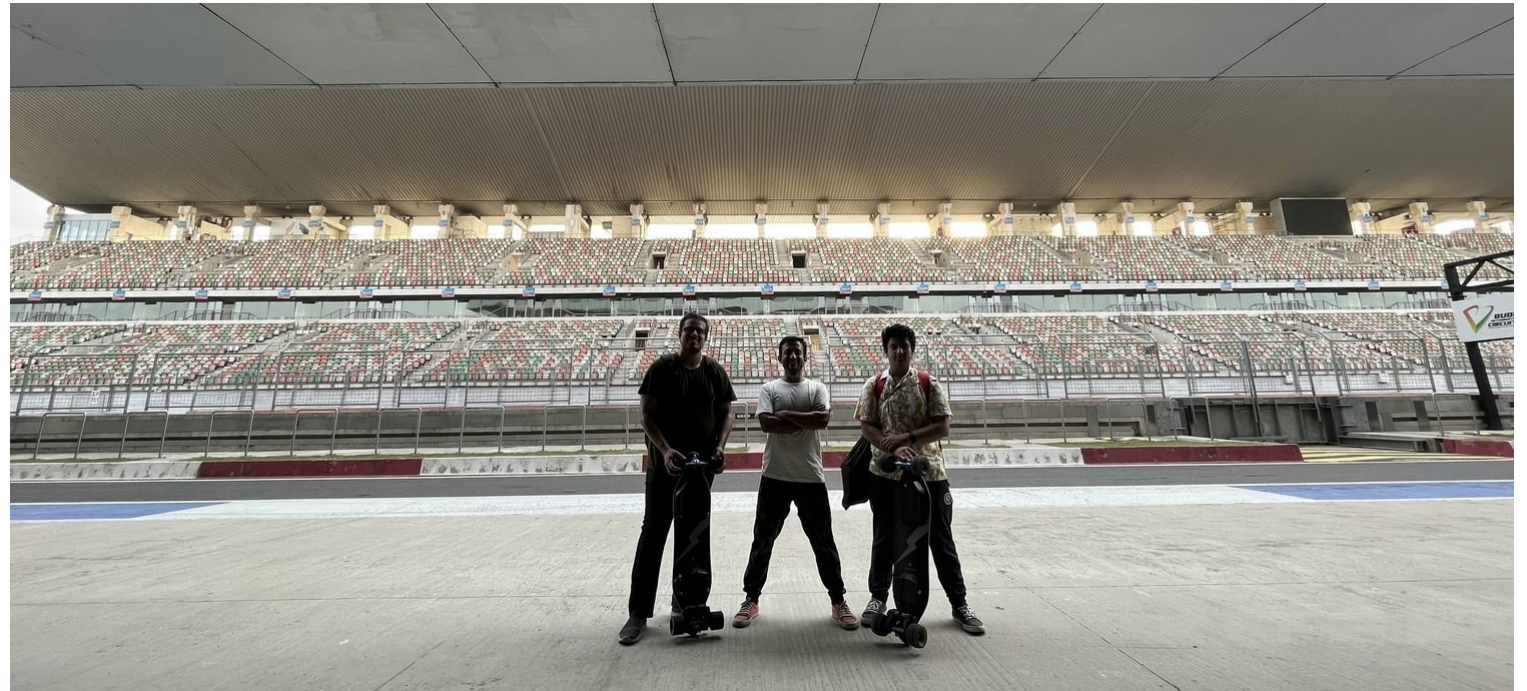


TESTED ON A FORMULA 1 CIRCUIT



TRACK DAY

Three people built Thunder-X, from the first sketch to the boxed pre-production board. On track days the team ran each build on the main straight and checked it over between runs, in 40 °C-plus Delhi heat.



EIGHT PROTOTYPES

Each prototype was ridden in every condition we could find, against the worst of Indian roads and weather. Most did not survive at first, but every finding went back into the CAD for the next build until the product was stress-tested and mature. Pre-production samples were made in 2022, roughly halfway through the prototypes, and the platform reached full reliability in 2023.

1 Every part on the bench

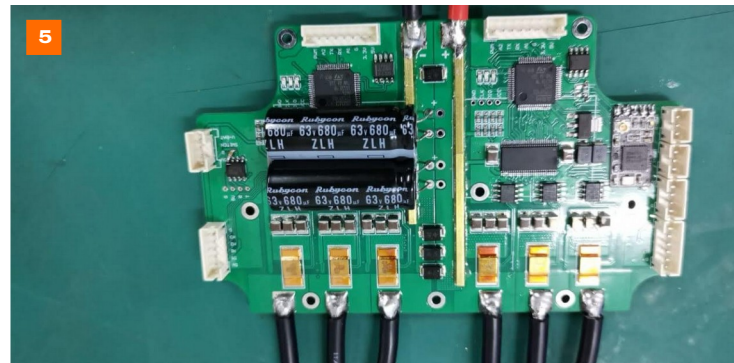
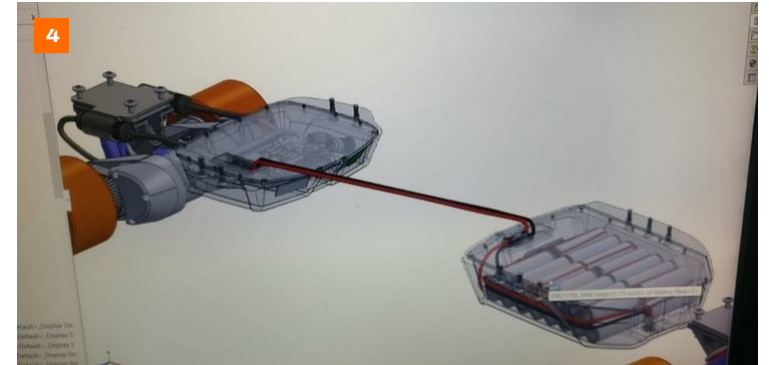
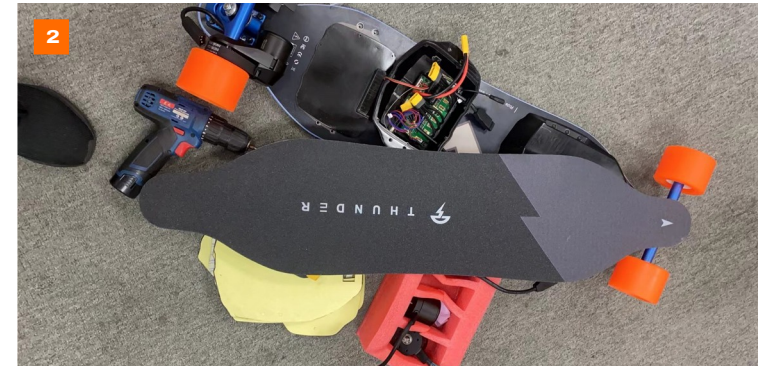
2 On-the-fly assembly

3 Battery prototype

4 Packaging study in CAD

5 Controller testing

6 Field testing



SUPPLIERS IN CHINA

With few local makers for these parts, we set up suppliers in China: CNC shops for the drivetrain, a deck press, enclosure makers, cell vendors and more. Each worked from our models and drawings where applicable. Most of this was done during the pandemic, with small first orders.

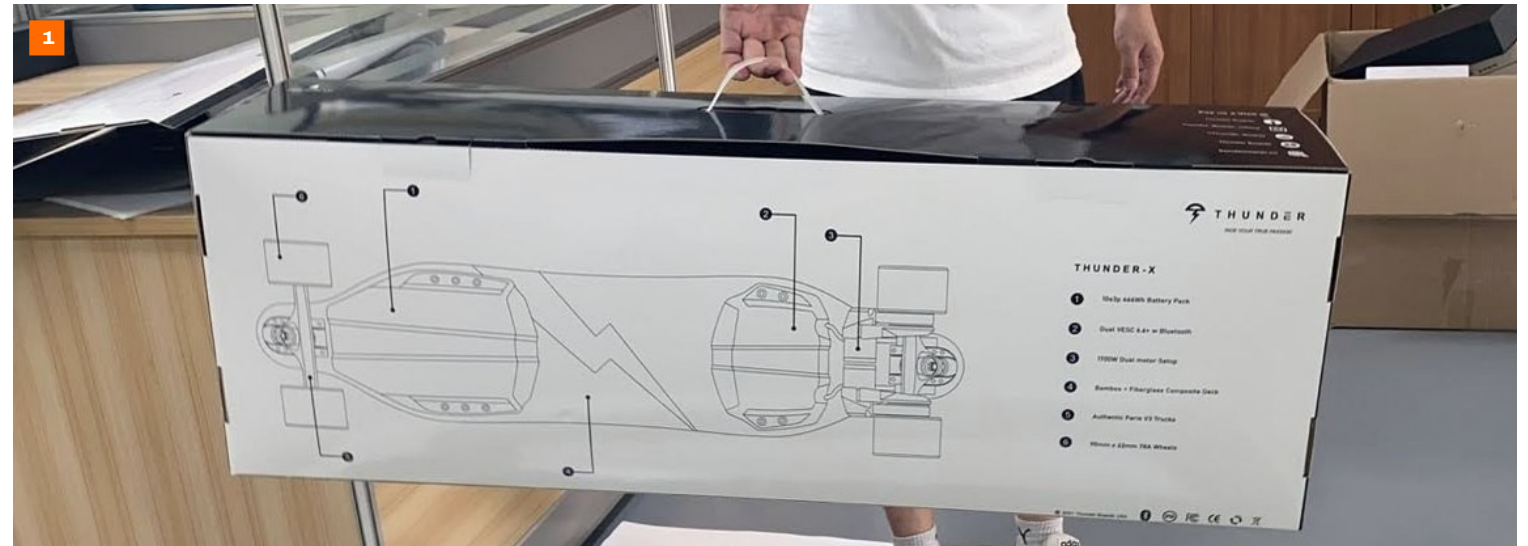


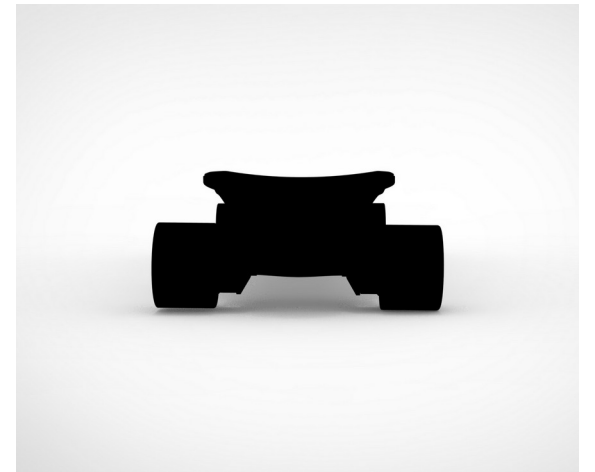
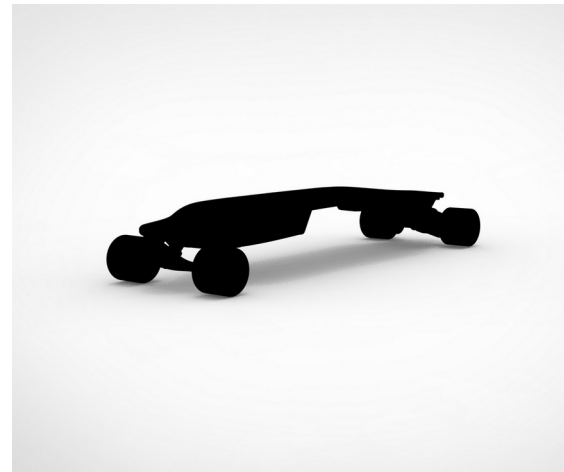
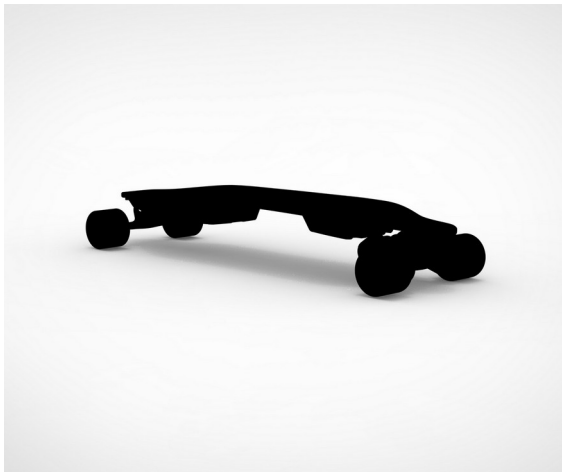
PRE-PRODUCTION SAMPLES

Thunder-X reached pre-production in 2022, with sample boards, retail packaging, review units for YouTubers and an accessory kit: charger, remote, spare belts and pulleys, bushings, bearings and a skate tool. An Ultimate combo added semi all-terrain wheels, premium lights and matching grip tape.



- 1 Retail box
- 2 Accessory kit
- 3 Pre-production sample





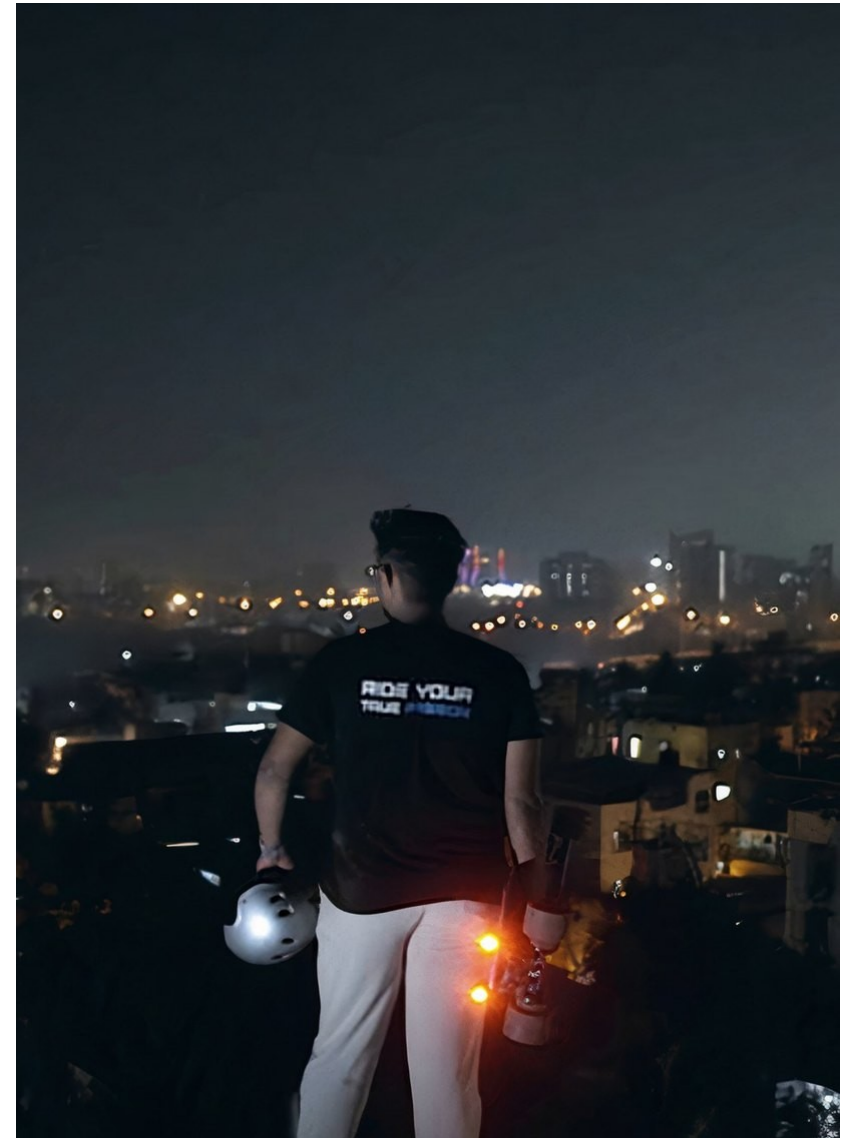
ON DISPLAY

During development, we showcased the board at exhibitions and events so people could feel the ride for themselves.



Lessons from building our own product, now applied to client work.

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| 01 | DESIGN FOR THE PROCESS | A part drawn for the way it will be made, whether CNC, pressing or molding, costs less and is more often right first time. |
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|----|---------------------------|---|
| 02 | BUILD WHAT SETS YOU APART | Buy proven parts where they exist. Spend time and money where the product is different. |
|----|---------------------------|---|
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|----|----------------------|---|
| 03 | TEST EARLY AND OFTEN | Give every prototype one question to answer. Real use finds faults that CAD does not. |
|----|----------------------|---|
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|----|--------------------------|---|
| 04 | GIVE SUPPLIERS FULL DATA | Clean models, drawings and BOMs make a distant supplier much easier to work with. |
|----|--------------------------|---|
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- | | | |
|----|--------------|--|
| 05 | PLAN THE BOX | Packaging, spares and accessories take longer than expected. Start them early. |
|----|--------------|--|
-
- TACTILE DESIGN





LET'S BUILD THE NEXT ONE

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