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INTRODUCTION

Earlier this week, we spent a day getting to know Microsoft's newest Surface device, the [Studio](#). Today, in response to overwhelming public outcry (a few folks asked about it on our [YouTube channel](#)), we're cracking open its hockey puck co-star, the Surface Dial. Brace yourselves, "turn it up to 11" jokes are coming.

Don't miss out on the next device dissection. Follow us on [Facebook](#), [Instagram](#), or [Twitter](#).

[video: <https://www.youtube.com/watch?v=KY7OBZQd3oQ>]



TOOLS:

- [Metal Spudger Set](#) (1)
 - [T6 Torx Screwdriver](#) (1)
 - [Tweezers](#) (1)
 - [Spudger](#) (1)
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Step 1 — Microsoft Surface Dial Teardown



- Some features of the Surface Dial:
 - Bluetooth 4.0 LE
 - Compatible with Surface Studio, Surface Pro 4, Surface Book, and any PC running Windows 10 Anniversary Update
 - Two AAA batteries
 - Two input methods: spinny and clicky
 - Sticky rubber foot to grip onto the Surface Studio glass

Step 2



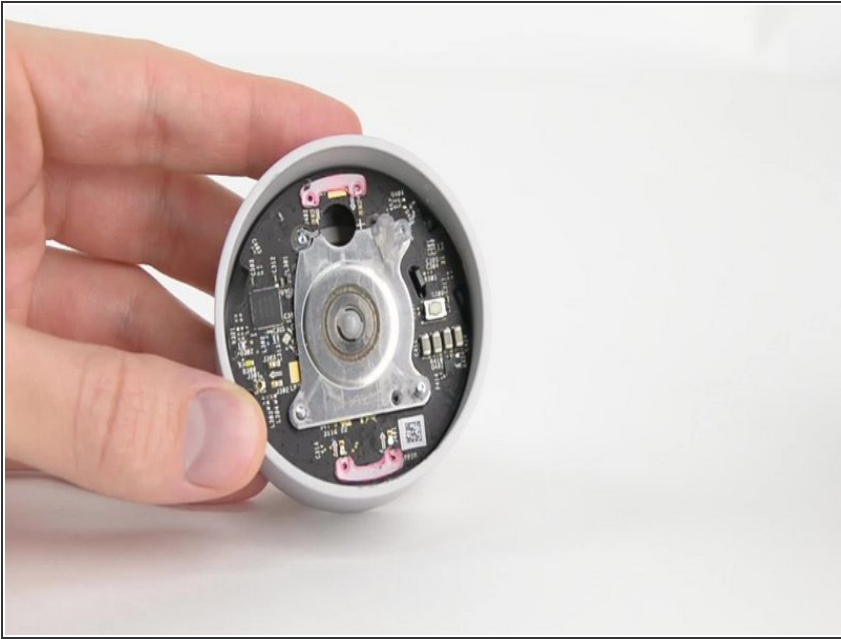
- The rubber foot has no visible fasteners. In fact, it has *invisible* fasteners—it's held on with magnets, and pops off and back on with no glue, tools, or fatiguable plastic clips. Sweet!
- Inside are the two AAA batteries powering the puck—the included Duracells aren't rechargeable, but you could replace them with your own rechargeable cells when the time comes.
- A sync button makes the only other feature in the Dial's entryway.
- Microsoft hid the Dial's model number, 1756, behind the batteries.

Step 3



- This Dial's solid construction is great (especially if it ends up [sliding](#) off your Surface) but also makes it a challenge to get into...
- Some aggressive prying led to aggressive snapping which led to aggressive... well, let's just say the midframe didn't come out without a fight.
- Removing the midframe/battery holder compartment, we get a peek at a sweet bearing, and some silicon!
- We also get to pop this (presumably Bluetooth) antenna off of the battery compartment.
- Along for the ride are four magnets, evenly spaced around the battery frame. Not only do they secure that sweet magnetic cover, they also give the Dial a little extra grip on the Studio's screen to combat the ol' downward slide.

Step 4



- The Dial's sick spinny action is used to full effect in disassembly, as well as every day use.
- The single access hole leaves more room for chips, and the smooth bearing lets us get to each of the T6 screws holding the body into the silver cover.

Step 5



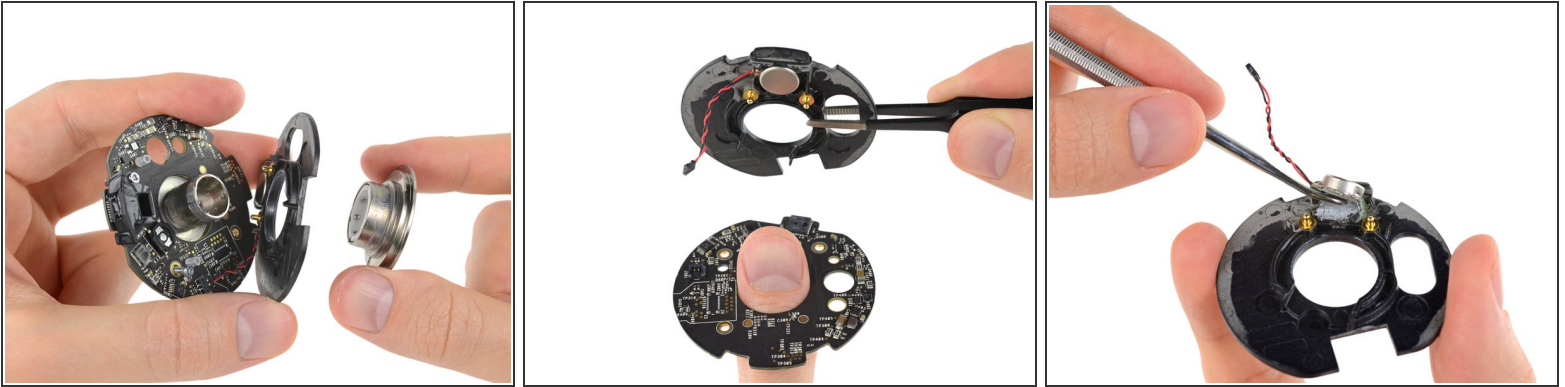
- After our less-than-ideal entry into the device, we somewhat guiltily spy a hole under the battery compartment. Could this be the real way in?
- We peel up a sticker and...
- The access hole that *would* line up with the three screws holding the Dial in its shell has been plugged up!
- ❗ Minus any mysterious methods Microsoft may deign to share with us, our best recommendation for opening your Dial is to drill through this plug and access the three screws using the above turntable method.

Step 6



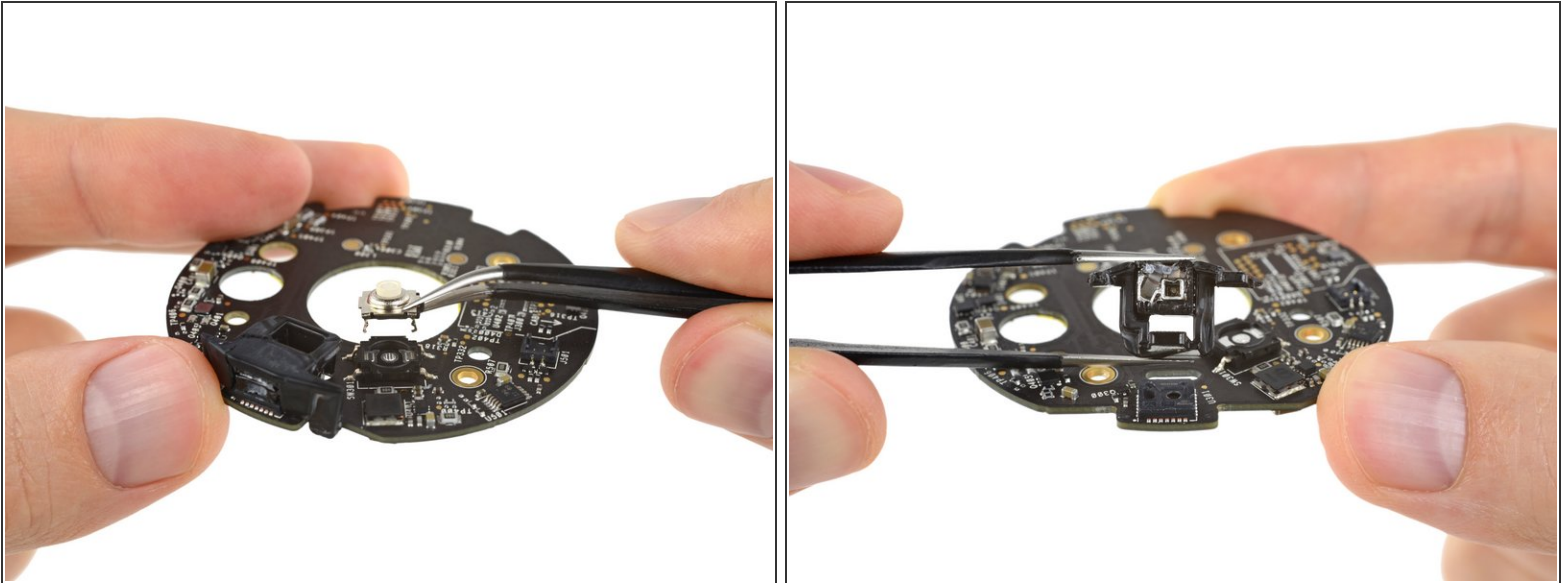
- Back to your regularly scheduled teardown: Thanks to our spin and unscrew technique, we're able to separate the guts from the outer casing.
- With the innards removed, we can see that the screws don't actually go *through* the bearing—just around it, grabbing it around the edge.

Step 7



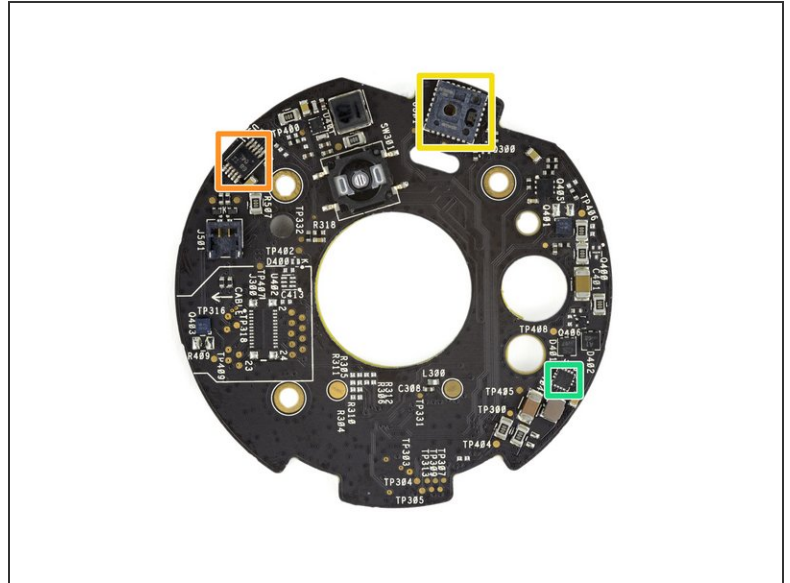
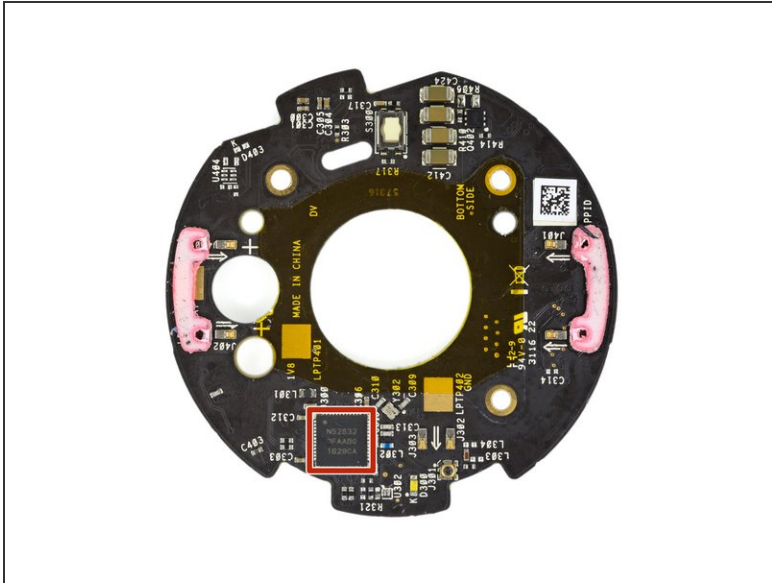
- To get in any further, we have to pop the bearing apart. It's a little greasy, and features a plastic cage for the ball bearings—surely a special recipe designed to give the knob that luxurious, high-end slightly-resistant feel to it.
- Lifting off the midframe reveals two springy posts opposite the switch. These springs even out the pressure so, no matter where you press, it feels the same.
- We also scrape out a pancake vibration motor, responsible for the buzzy feedback you get when spinning or clicking the Dial.
- The bit of the midframe holding the vibrator has a rubber O-ring, presumably for vibration dampening.

Step 8



- And now for the grand finale, the hardware responsible for all of the Surface Dial's many features. The clicky *and* the spinny.
- This microswitch handles the Dial's click function.
- As for the spinny function, this component looks awfully similar to the optical sensor in the [Nest](#), that worked just like an optical mouse pointed at the inside wall of the metal casing.
- Unlike in the Nest, we find a lightguide, that looks like it bends the light to and from the optical sensor 90 degrees, to avoid mounting the sensor on its own board, parallel to the case.

Step 9



- Such chips. Here it is.
 - Nordic Semiconductor [nRF52832](#) Bluetooth Low Energy SoC
 - Texas Instruments [DRV2604L](#) Haptic Driver
 - Optical Sensor
 - DC-DC Converter

Step 10

- This Dial has us running in circles! Or at least laying the circles out. Here's a round up of all the circular bits and bobs that make this thing spin!

Step 11 — Final Thoughts

REPAIRABILITY SCORE:



- The Surface Dial earns a **4 out of 10** on our repairability scale (10 is easiest to repair):
 - You can swap in ordinary rechargeable AAA batteries in seconds with no tools.
 - While it is durable, and repairs are unlikely, the components most likely to fail can't be replaced without damaging the device.
 - Haptic vibration motor is cemented down with some spectacularly tough glue.
 - You won't be servicing anything here without a guide and courage enough to drill out the plastic plug guarding the single, well-hidden access point.