



Smart Keyboard Teardown

Smart Keyboard Teardown performed on November 20, 2015.

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INTRODUCTION

Apple has launched the next phase in their master plan to replace all personal computers with iPads. Apple's Smart Keyboard is an iPad Pro accessory designed to bring even more functionality to the table(t). But does it bring repairability? With teardown on our minds, we decide to find out just how smart this keyboard really is.

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TOOLS:

- [iFixit Tech Knife](#) (1)
- [iOpener](#) (1)
- [iFixit Opening Picks set of 6](#) (1)

Step 1 — Smart Keyboard Teardown



- Check out these smart specs!
 - Smart Connector for power and data connection
 - 64 Key, QWERTY keyboard
 - Water and stain-resistant

Step 2



- The bottom flap is home to all the regular suspects—regulatory markings, country of origin, and a new model number: A1636.
- Hamburger? Hot Dog? With all these folds, the Smart Keyboard definitely breaks the record for the most confusing combination keyboard/case ever.
- Seriously, this thing has so many sections, Apple even included a handy "[guide](#)" on how to fold it correctly.
- We finally get the Smart Keyboard to bend to our will and lay *mostly* flat (not taking into account the 4 mm depth of each individual key). It looks like the perfect [symmetry](#) we found in the iPad Pro doesn't carry over to its accessories.

Step 3



- On the left, an iPad Pro with the Smart Keyboard. On the right, a Surface Pro 4. We're pretty sure anyway, the differences are pretty slight at first glance.
- The most marked difference between the key layouts is of course the Surface's trackpad. iPads just want to watch the world burn...
- *i* We know, iOS doesn't support *any* mouse-type input, so a trackpad here wouldn't really work. Still, with the rapidly growing number of iPad applications, we are hopeful...
- The Smart Keyboard features some iOS hallmarks, like the keyboard swapping globe button, and rounder key edges.
- However the iPad Pro also seems to be taking some notes from its notebook cousins, the Smart Keyboard has control, option, *and* command keys.

Step 4



- ⓘ In order to make the Smart Keyboard water and stain-resistant, Apple encapsulated the entire accessory inside some high tech fabric.
- Finding no viable entry points, we turn to our [Tech Knife](#) for sage wisdom.
- We slice and dice the microfiber lining of the keyboard as we burrow our way towards victory.
- ⓘ At this point, it's readily apparent that this teardown is an [irreversible process](#).

Step 5



- We peel up the top layer of mysterious fabric (we think it's nylon—our teardown engineer notes that it feels like a windbreaker) to find blank keys.
 - ⓘ Perhaps [Jony Ive](#) was worried about your keyboard getting too cold?
- Moving past the fabric, we begin prying out the individual keys and get our first glance at the dome switches underneath.
 - ⓘ As Apple stated during their keynote, these switches are the same as those found in the [2015 Retina MacBook](#).
- One design choice we like is the placement of a stiffening weight in the spacebar.
 - The addition of this bar means the spacebar key can register a push no matter where you tap on it. No wobbly spacebar woes here.

Step 6



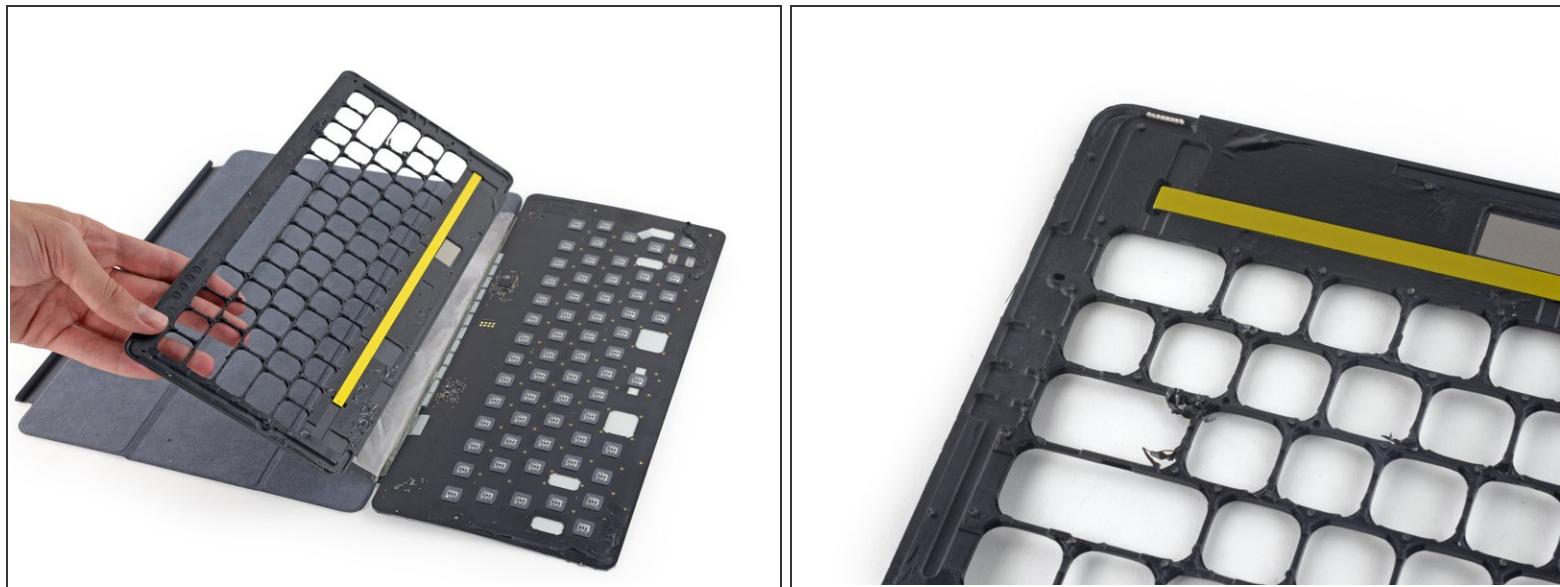
- We call upon our iOpener to heat the microfiber lining, allowing us to delve further into the multiple layers of the Smart Keyboard cover panel.
 - We're starting to feel like archeologists, digging through the ages...
- *i* Underneath the soft display cover we find... nothing really.
- *i* Time for a brief message from our sponsors: We're excited to announce that we've just released a completely redesigned [Pro Tech Toolkit](#), complete with all of the tools you need, and none that you don't.
- With this tough plastic layer blocking further keyboard inroads, we're going to need one of those tools...

Step 7



- Like a plastic opening pick.
- We crack open the clam and the ~~pearls~~ keycaps come cascading out.
- We now have the pleasure of viewing the entire underlying circuit board, replete with 64 dome switches.
- But not much else, no LEDs, or batteries or fancy fans needed here!

Step 8



- Another one bites the dust. We pull the keycap frame away for a closer look.
- There are some interesting intestinal squiggles in this plastic frame, what's up with that?
- Closer inspection shows these channels lead to tiny vents at the top of the keyboard.
 - We assume this keeps the Smart Keyboard from becoming a pressurized balloon every time a key is depressed.

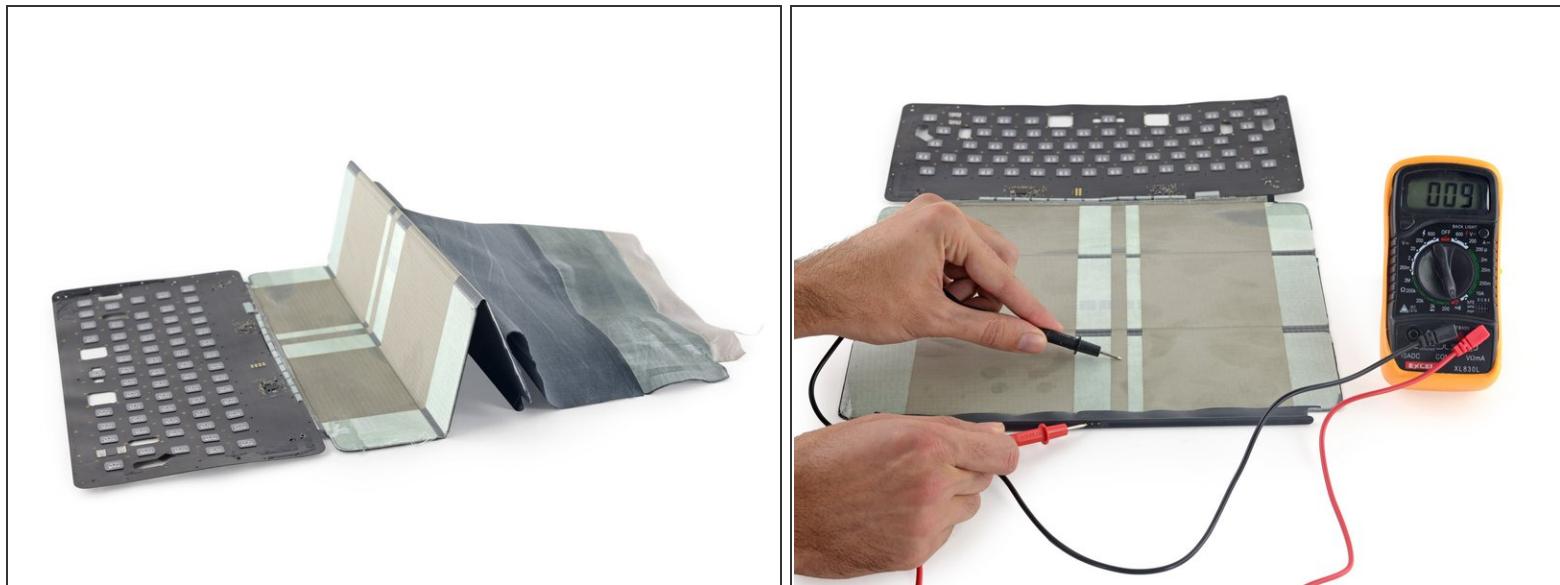
 Let's hope these holes don't let water in...

Step 9



- Time to peel up yet another layer! In fact, it's that tough plastic backing we encountered earlier. It's aggressively glued, so we aggressively, well, ripped it in half...
- Finally, the true keyboard is revealed—a plane of switches and chips!
- The brains of the operation is Apple's latest go-to microcontroller for [peripheral input devices](#):
 - ST Microelectronics [STM32F103VB](#) 72 MHz 32-bit RISC [ARM Cortex-M3](#)

Step 10



- Peeling up the last of the Smart Keyboard's pelt reveals three interesting fabric strips.
- Turns out, these are made of Apple's mysterious "conductive fabric." These connect the keyboard to the Smart Connector and allow for a "two-way flow of power and data."
- *(i)* We're excited about this design feature, as these fabric strips *should* be more durable and fail-resistant than wires or traditional flex cables.
- Apple even states "unlike traditional wires, the conductive fabric can withstand a lifetime of folding." Sweet!

Step 11



- The Apple Smart Keyboard repairability **0 out of 10** (10 is easiest to repair):
 - While durable, the keyboard is impossible to open without damaging, meaning no internal components can be replaced without destroying the device.