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# INTRODUCTION

After three years of research and development, Apple has released the newest version of their popular headphones, now dubbed "EarPods." Join us as we crack these pods open and take a look at what three years of R & D can accomplish.

Love all of these gadget teardowns? Be sure to follow [@ifixit](#) and stay up to date on all the latest happenings from our teardown lab.



## TOOLS:

- [Precision Utility Knife](#) (1)
  - [iFixit Opening Picks set of 6](#) (1)
  - [Metal Spudger](#) (1)
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## Step 1 — Apple EarPods Teardown



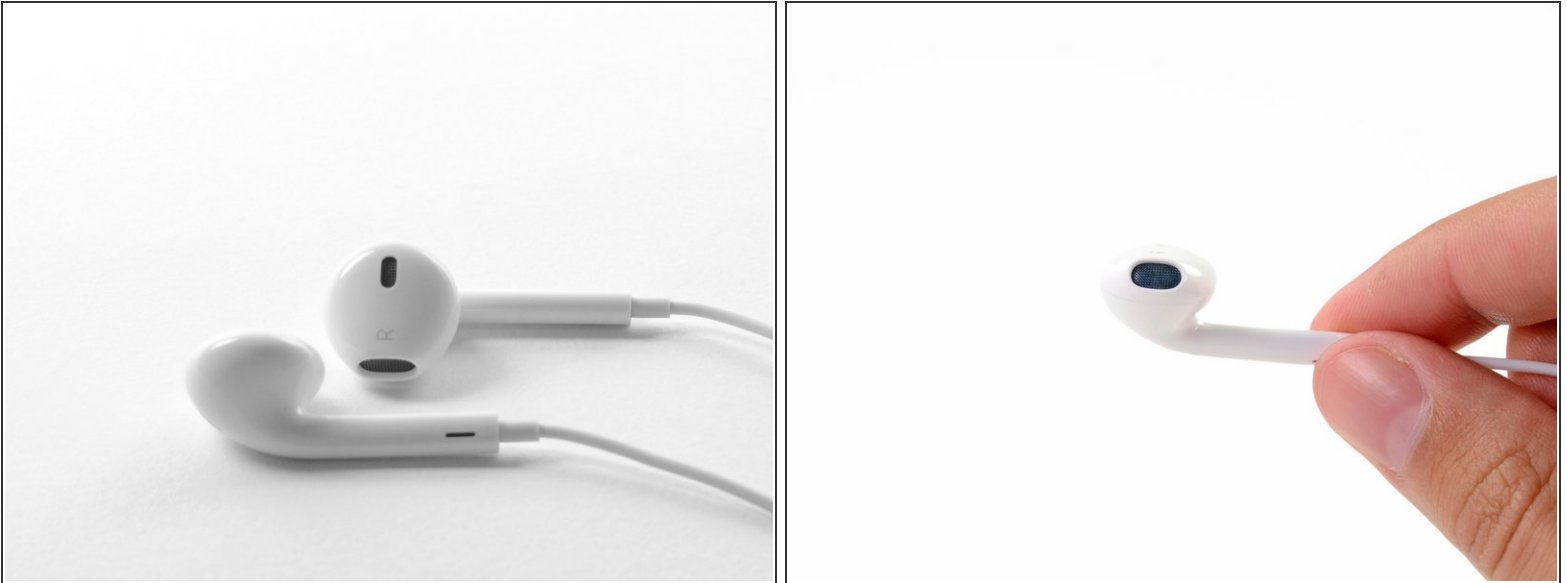
- What better accessory to accompany the new-and-improved iPhone than a set of new-and-improved headphones?!? Here are some of the hot new features on Apple's freshest auditory accessory:
  - Redesigned case for improved in-ear fitment and sound distribution.
  - Exterior acoustic vents for increased bass.
  - In-line microphone and volume remote.
  - Dual-material speaker diaphragms to cut sound loss and increase output.
- Standard issue with any new iPhone 5, iPod Touch 5th Generation, or iPod Nano 7th Generation.

## Step 2



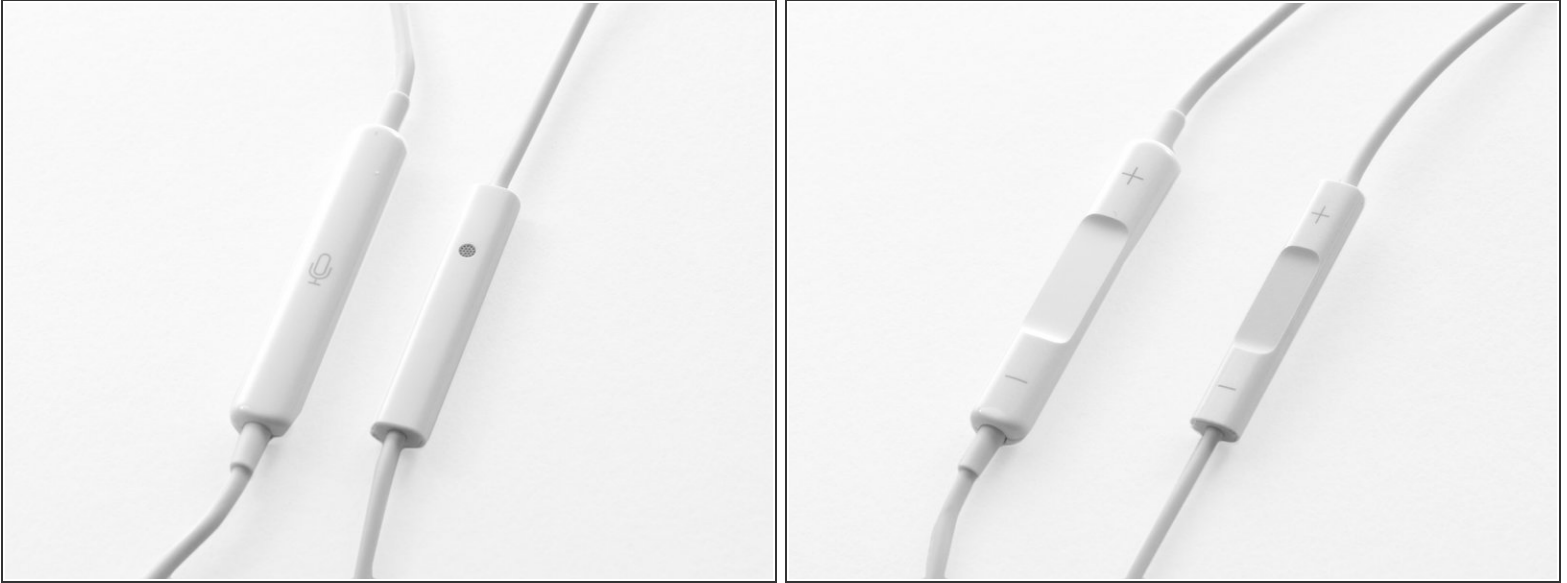
- In case you were wondering, the EarPods have a model number of MD827LL/A.
- Apple claims that their new EarPods perform at the same level as headphones that cost [hundreds](#) of dollars more, but these sweet beat makers will only cost you \$29 (plus tax, [if applicable](#)).
- Call us skeptics if you'd like, but we're not sure how that could be accomplished with a [single-driver](#) setup.

### Step 3



- The first thing we notice (and already knew) is the totally redesigned shape of the EarPods. Apple seems to believe that cramming a perfectly round earbud into your ear is no smarter than trying to fit a square peg through a round hole.
- With the EarPods in your ears, it's actually pretty difficult for passersby to tell that your headphones aren't just good ol' Apple Earbuds.
  - If someone *can* tell, they either have quite an eye for detail, or they're way too close to your face.
- The next noticeable design feature for the EarPods is that the main speaker port faces forward, rather than directly into your ear canal.
  - Is sound that is not pointed directly at your ear drum better to listen to? We don't know, but that's the verdict of Apple's acousticians, and they get paid a lot of money to do what they do.

## Step 4



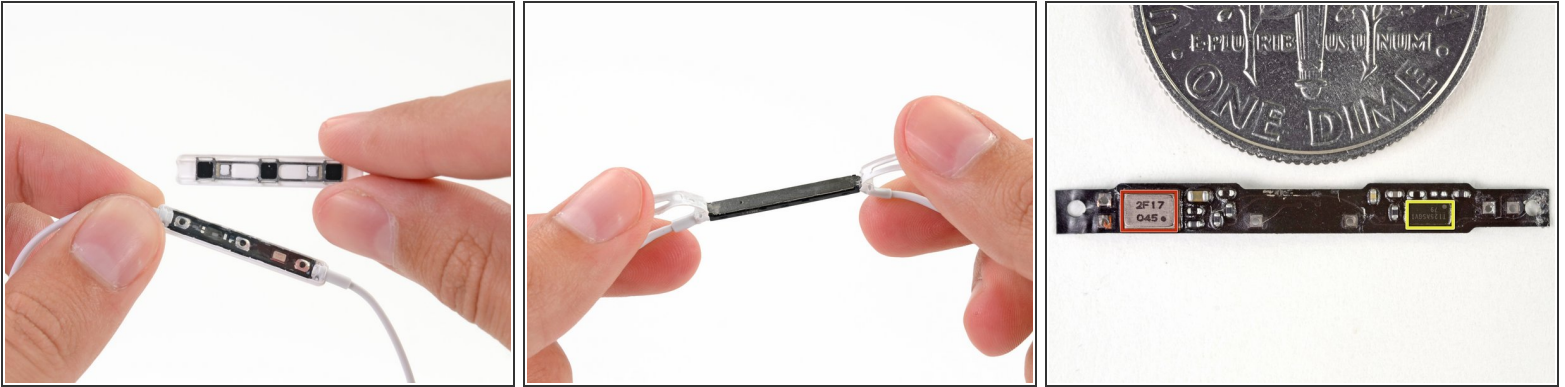
- Apple had durability in mind with the new EarPods. Notice the new remote design (left), which includes larger cable wrapping near the remote than the previous earbuds (right) to reduce strain on the wires.
- If you're using your EarPods with an iPhone or iPod, chances are you'll be stuffing them into your pocket or backpack a lot, which can put a lot of stress on the connections.
- ~~To make the new EarPods more resistant to water and sweat damage~~ Apple's designers removed the external microphone grate.
- ❗ As an iFixit user rightfully pointed out to us, the previous microphone grate was for show only! We confirmed that no hole exists in the plastics. Thanks [Todd!](#)

## Step 5



- It's finally time to crack these little guys open; this is a teardown, after all.
- We prefer to use our [guitar picks](#) to shred a pair of EarPods instead of [shredding a guitar](#) (which would probably sound great through the EarPods).

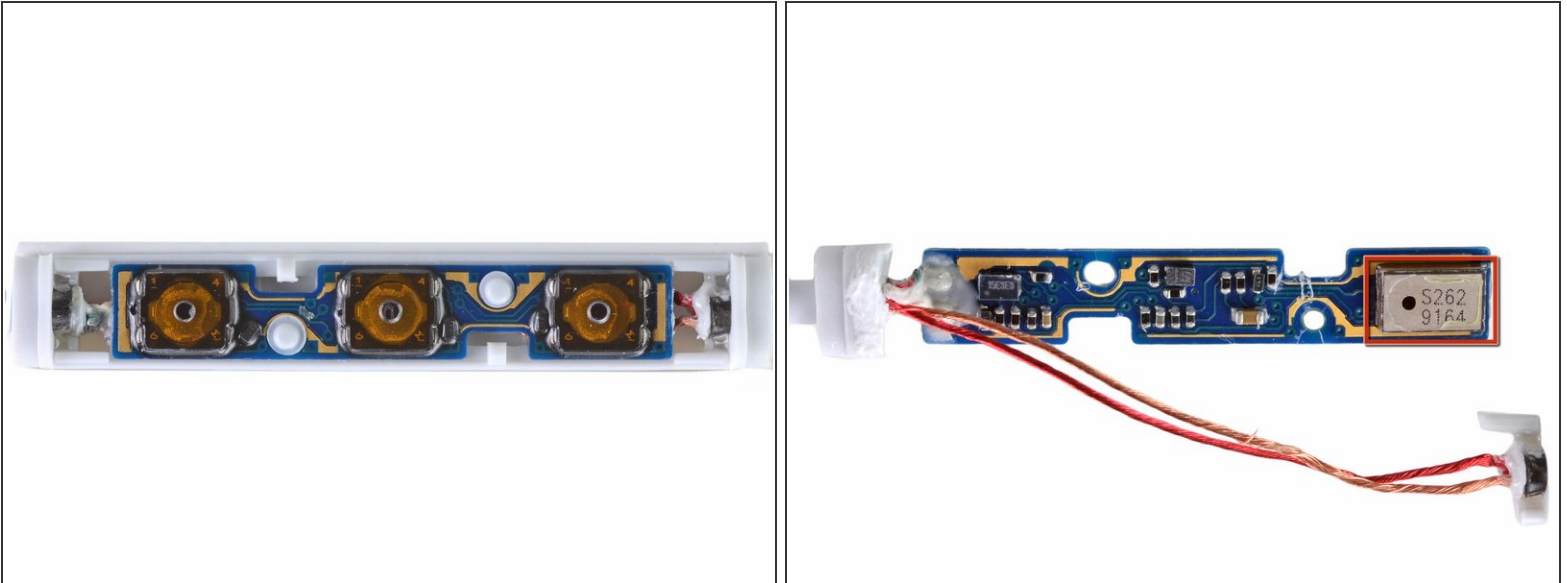
## Step 6



- The underside of the remote cover reveals three buttons and a microphone. No surprise here, as the remote has three buttons.
- With a little more coaxing cutting, we are able to remove the flexible PCB within the EarPods' remote.
- The microphone in the EarPods' remote bears the markings 2F17 045.
  - Will this microphone be similar to one of the three microphones inside the iPhone 5? Probably. Will it be the same? All will be revealed in ~~due time~~ three more days.
- We also uncover another IC with the markings TI25ASGVI 079, which [Chipworks](#) believes to be a Texas Instruments [ADC](#), or a device used for volume-control duty.
  - All these components look large when shot in our pictures, but they're quite small in real life. That's how the board looks like when compared to a U.S. dime.

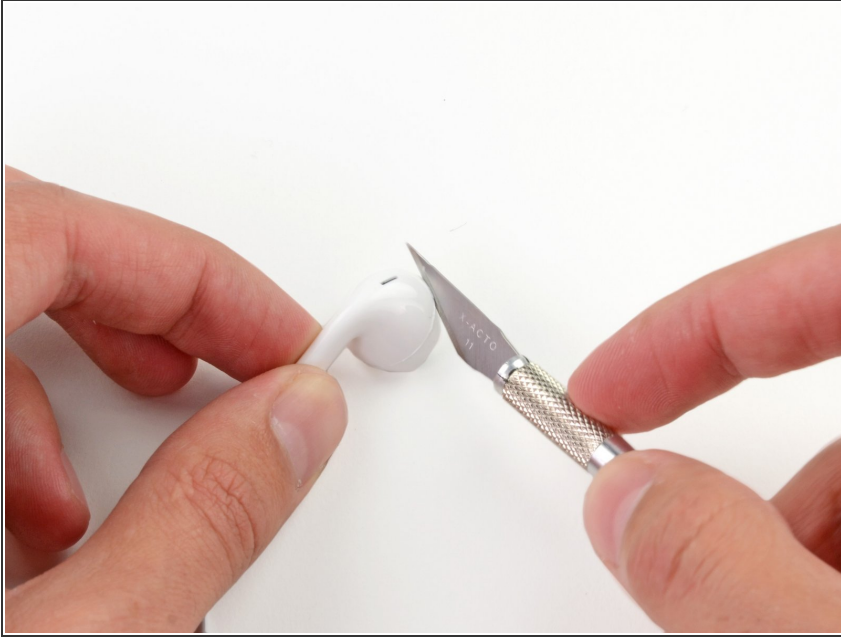


## Step 7



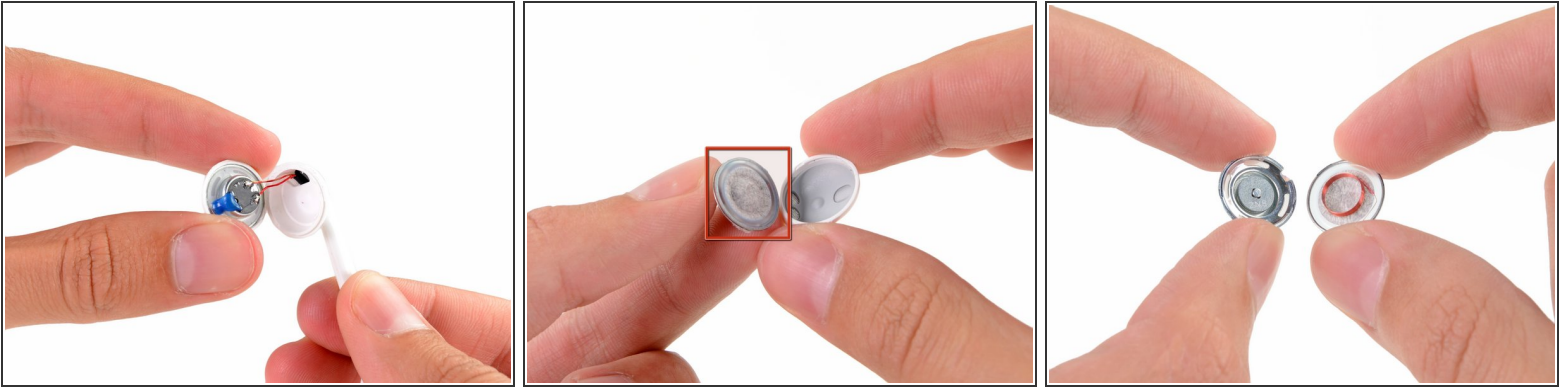
- As a reference, here's what the insides of the old remote look like: ~~two turntables~~ three buttons and a microphone.
- The control board in the old earphones isn't nearly as sealed or secured as the new EarPods, leading to a common complaint among gym-goers finding that their sweet earphones don't work so well when doused in sweat.
- The microphone reads: S262 9164.

## Step 8



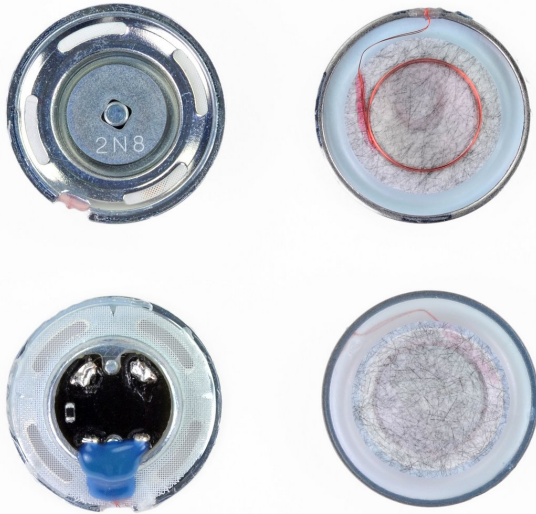
- With such a tight fit between the two halves of the EarPods, simply pulling them apart wasn't an option. We knew what we needed to do.
  - We don't normally cut open earbuds, but when we do, we prefer [X-Acto #11](#) blades.
- ⚠ This isn't something you'd want to try at home. Once these Pods are open, they're not closing back up unless you want to involve glue.

## Step 9



- While an updated remote is nice, the real innovation in the EarPods is in the speakers.
- Like most speakers, the speakers in the EarPods consist of a diaphragm/cone, a voice coil, a permanent magnet, and a cabinet.
- Paper or Plastic? The voice coil is supported by a composite [diaphragm](#) made of a paper cone and a polymer surround. This is the first iteration of Apple headphones to use paper cones rather than all plastic.
- The most exciting—and most widely publicized—feature of the EarPods is the unique teardrop-esque shape of the cabinet.
  - Yet once these guys are open, things start looking quite similar to other earbuds.
  - Apple spent a lot of time analyzing people's ears, so hopefully their external design will pay dividends in the auditory excellence department.

## Step 10



- For the audiophiles, here are front and back views (top and bottom, respectively) of the separated drivers.
- Apple's switch to paper-based speaker cones may be the source of their advertised improved low and mid-range response.
- We also discovered that the speaker basket has a much more refined look than previous models (see comparison in next step), with a fine mesh covering the back and symmetrically-placed vents.
- The basket is a critical component, as it must be rigid to maintain consistent sound quality while still being open enough to not inhibit movement of air behind the vibrating diaphragm.

## Step 11



- Hardly peas in a pod, different revisions of Apple earbuds exhibit some drastic changes in internal construction and driver design.
- From the top, we have:
  - Previous-generation iPhone earbuds
  - First-generation iPod earbuds
  - New-generation Apple EarPods
- The most notable differences separating the EarPods are just what you'd expect—a drastically redesigned housing, and a new material for the speaker cone.

## Step 12



- At iFixit, our bottom line is durability and repairability, and their impact on electronics waste.
- The new Apple EarPods do have significant improvements in durability:
  - The new remote is better sealed against water damage, and features strain relief wrapping to increase the life of the cable.
  - Paper speaker cones are more resistant to tearing than plastic, decreasing the likelihood of [blowing](#) out your drivers.
- But unfortunately, these products are still of the throw-away kind. Sourcing parts is next to impossible, and it would be a tough sell to convince someone to take apart their earbuds instead of buying a new pair. They will never be the same once taken apart.

To reassemble your device, follow these instructions in reverse order.