



Toniebox Teardown

Teardown of the Toniebox—an audio player for children above the age of three, first released in spring 2016.

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INTRODUCTION

The Toniebox is a popular audio player for children over the age of three, with easy-to-understand touch controls and small figurines (Tonies) with integrated NFC that work sort of like cassettes or CDs (remember those?). Why stop at an unboxing when we've got a perfectly good teardown table?

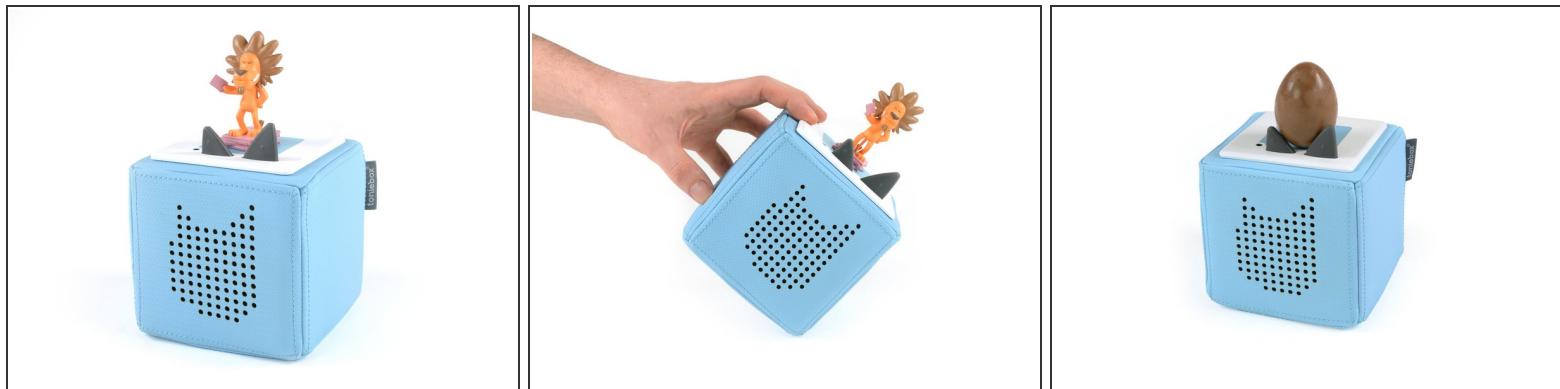
Toniebox, prepare to meet your unmaker.

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TOOLS:

- [Tweezers \(1\)](#)
- [Precision Utility Knife \(1\)](#)
- [Phillips #1 Screwdriver \(1\)](#)

Step 1 — Toniebox Teardown



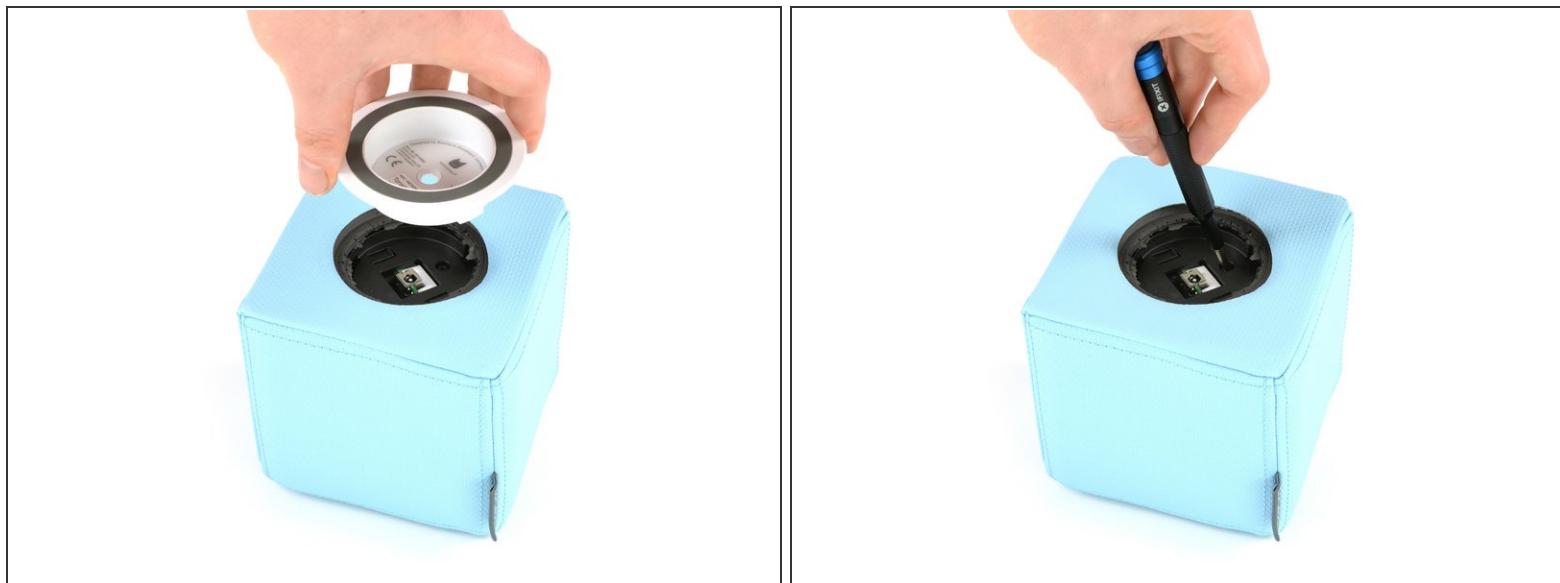
- The Toniebox is designed as an audiobook player for kids (age three and up), and packs the following features:
 - Motion control, via slapping the side or tilting the box
 - Small figurines (Tonies) with built in NFC chip
 - Soft shockproof shell
 - Internal storage for up to 400 hours of audio data
 - 7 hours battery capacity
 - Magnets in the top of the Toniebox, and in the sockets of the Tonies, to keep them stuck together while you tilt and turn the box
- ① There was no NFC chip in our [Kinder-Egg](#) today—so sad.

Step 2



- Because we're doing this teardown in Germany, we'll forgo the usual metric and imperial measuring shenanigans and simply give you a [banana for scale](#).
- Each side of this cube measures 3/4 of a banana. (4.7 inches or 12 cm according to the manufacturer, who evidently did not have a banana handy.)
- Placing the banana onto the NFC sensor also doesn't play anything.

Step 3



- The cover on the bottom is as stubborn as a pickle jar. But hey, we have seen far worse opening procedures! Besides, the rest looks pretty easy.
- A single Phillips screw holds the innards in the foam housing. Just the way we like it.

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Step 4



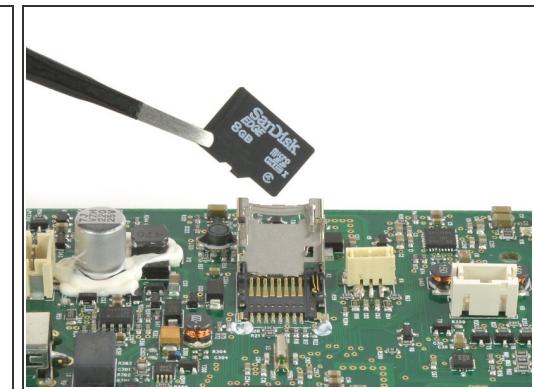
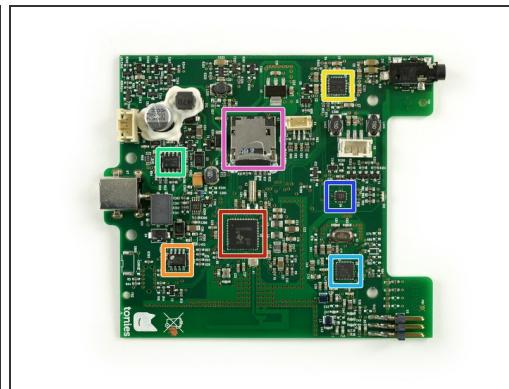
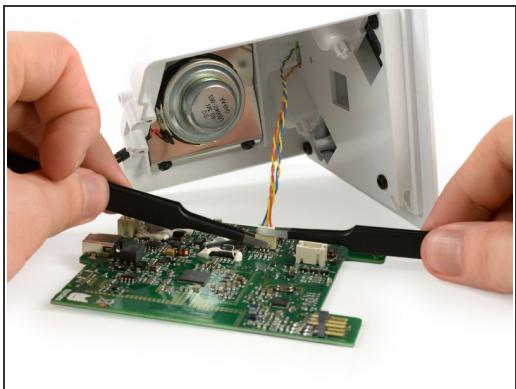
- Now for the "unboxing".
- The main components lift right out the top of the box. Easy peasy.
- Surrounding it is this black cage, which is also easy to take out and seems to serve mainly for crush protection.
- The squeezable foam bumper comes out last. According to the manufacturer, it's made from sustainable fabrics.

Step 5



- The battery pack and motherboard are secured with just two standard Phillips screws.
- As printed on the back, the battery pack consists of three AA batteries with a charge capacity of 2,000 mAh.
- The manufacturer states this is a nickel-metal hydride (NiMH) battery pack—chosen because it's a safer technology than lithium-ion, and has almost no memory effect.

Step 6



- We'll have a look at that motherboard just as soon as these stubborn little cables are unplugged. Let's see what all the noise is about! Onboard we find:
 - Texas Instruments [C3200R1M2](#) microcontroller serving as CPU and WLAN Receiver
 - [ISSI IS25LQ032](#) flash memory
 - A [Texas Instruments DAC3100 TI 7BI ANVS G4](#) Audio Controller
 - Battery loading IC
 - A [TRF7962A RFID Reader](#) to read the NFC chips from the Tonies
 - [NXP MMA8451](#) accelerometer for fast forward and rewind functions.
 - And a Sandisk Edge 8 GB MicroSD card formatted as Fat32

Step 7



- And now for the Toniebox's vocal chords cords!
- Speaker specs: $4\ \Omega$ and 3 W. 'Nuff said. We weren't exactly expecting high fidelity audiophile hardware, after all.
- *(i)* The manufacturer's [homepage](#) gives a bit more info, including the nominal load- and music-carrying capacities (3 W / 5 W) and that the speaker spans the audio spectrum from 20 Hz to 10 kHz.

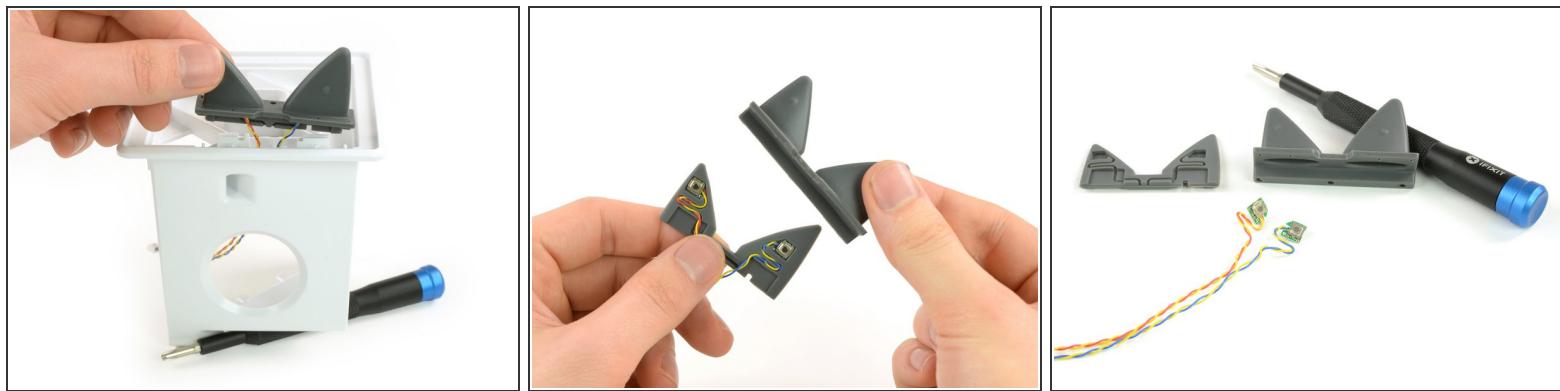
Step 8



- Just four more Phillips screws, and we can remove the cap.
- Inside the cap we find a second PCB, this one responsible for the NFC connection.
- Except for another socket to connect with the motherboard and another [crossed out trashcan \(WEEE-Symbol\)](#), there's nothing to see here.

ⓘ No microphone found on the top PCB nor the motherboard. This means the Toniebox is acoustically unaware of its surroundings.

Step 9



- Next we inspect the volume control buttons, located (rather appropriately) in the ears of the Toniebox.
- Removing the outer layer of the ears, we find two small buttons.
- Because the buttons connect to the motherboard via a JST plug, we don't need to [cut a wire](#). Lucky us.

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Step 10



- Bonus teardown: We perform minor surgery on the lion figurine and find, as expected, an NFC chip in his stomach.

Step 11 — Final Thoughts



- That's all, folks! We completely tore down our Toniebox, cut open the lion, and spread everything over the table. Here is our result:
 - All the screws are standard Phillips screws and no adhesive was used.
 - The box is easy to disassemble and reassemble, without damaging it or leaving any marks.
 - Battery pack and flash memory are also pretty common and easy to change.
- The cap on the bottom is held in place by plastic clips, which could break if you open the box repeatedly.
- Some of the plugs sit in their sockets pretty tight and might be hard to unplug without damaging the sockets.
- The headphone jack is soldered to the motherboard.