GE 27990G3 Cordless Phone Teardown

Full teardown of a cordless phone from 2001.

Written By: jdp23

INTRODUCTION

Full teardown of a cordless phone and accessories from 2001.

🔧 TOOLS:

- Metal Spudger Set (1)
- Phillips #0 Screwdriver (1)
- Flush Wire Cutters (1)
- 8" Needle Nose Plier (1)
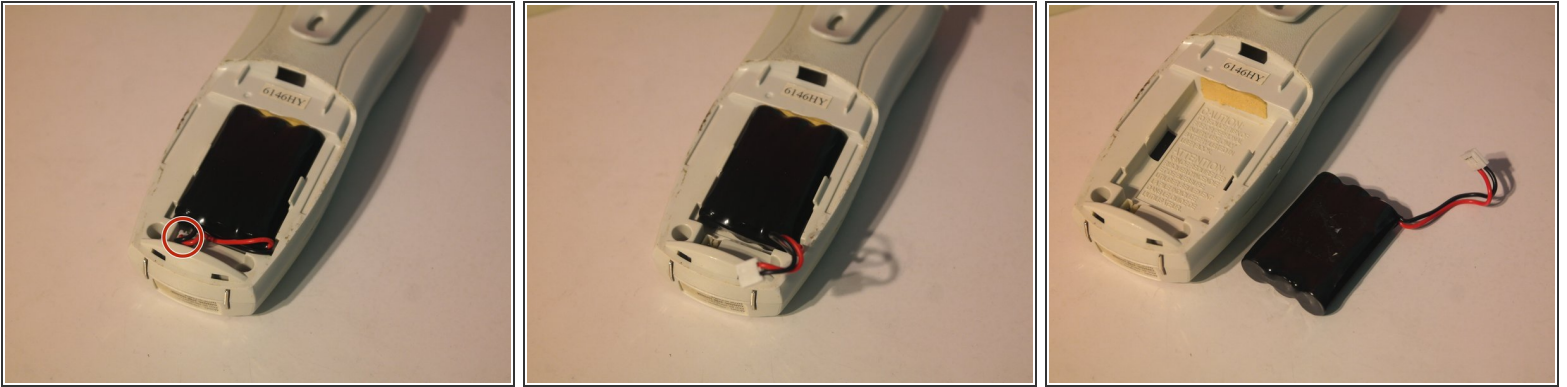
Step 1 — GE 27990G3 Cordless Phone Teardown

- This is a teardown of a GE 27990G3 cordless phone system from 2001. Sadly, while it still works, its 2.4 GHz wireless transmitter interferes with WiFi.
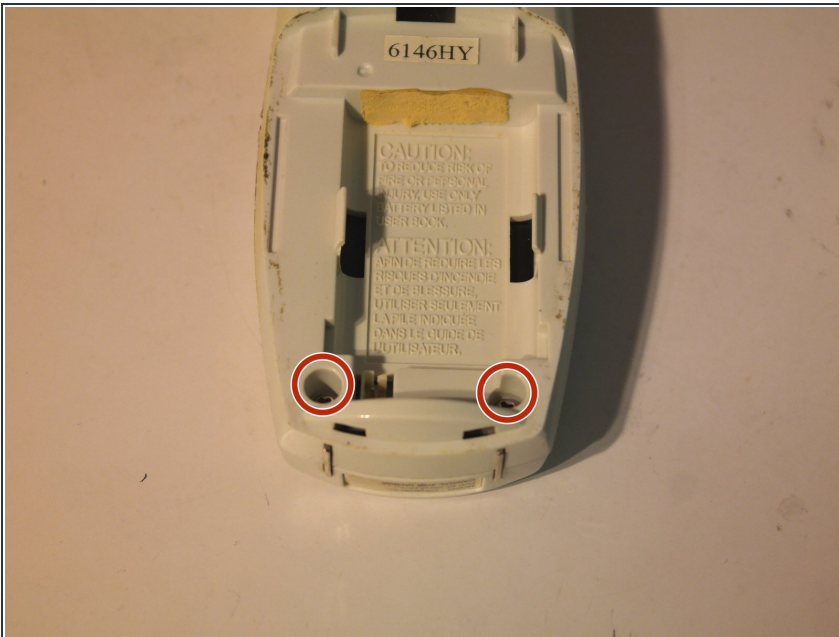
Step 2

- **Part I: The Handset.**

- Remove the battery door on the back.

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Step 3

- Use needlenose pliers to disconnect the battery connector.

- The battery is a 3.6V Nickel-Cadmium rechargeable battery made up of 3 AAA-sized cells
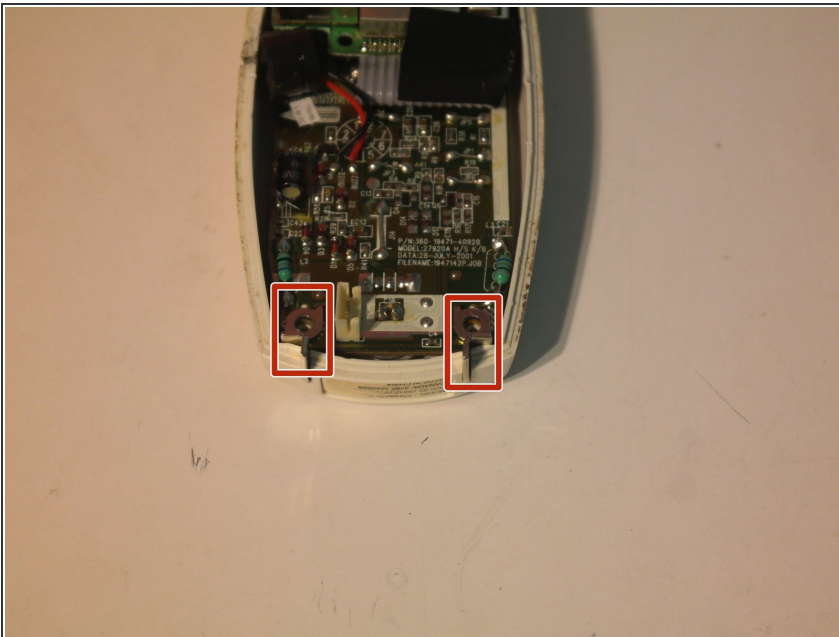
Step 4

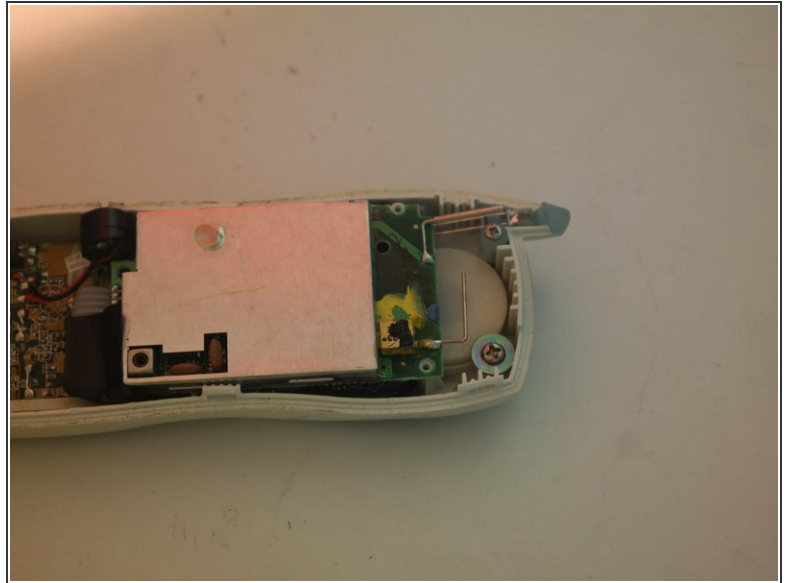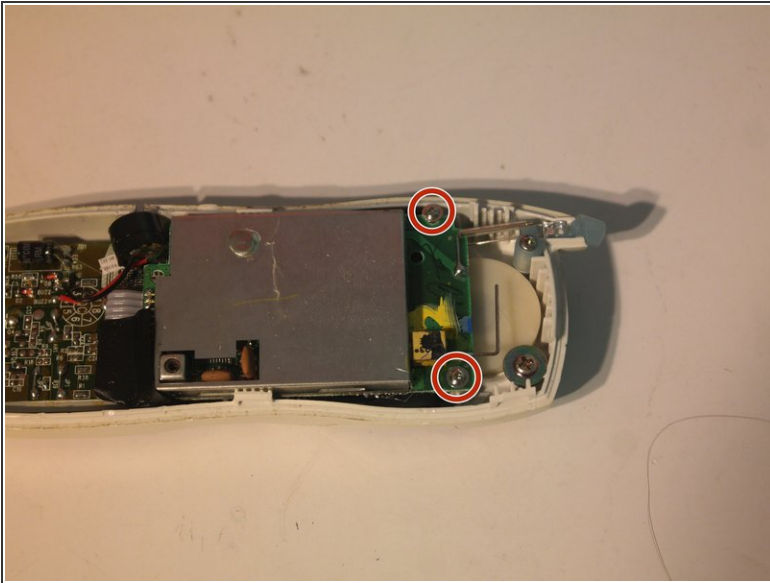- Remove 2 phillips screws inside the battery compartment.

Step 5

- After some aggressive spudgering (the pictures make it look much easier), the back of the case can be removed.
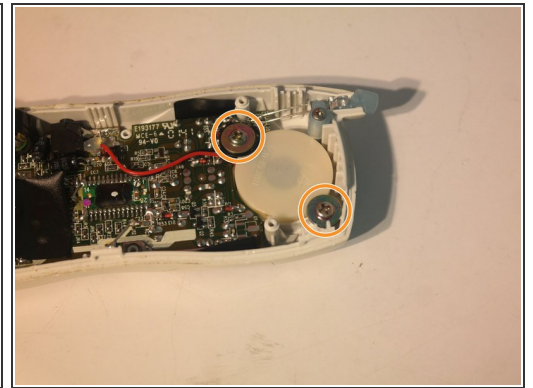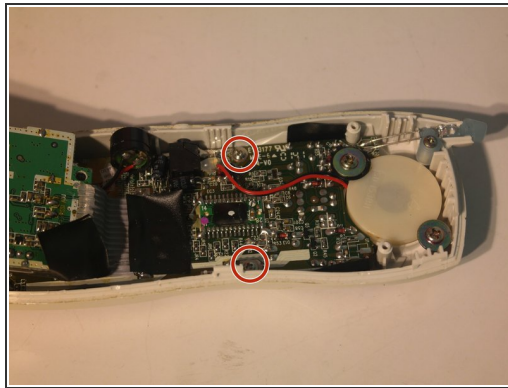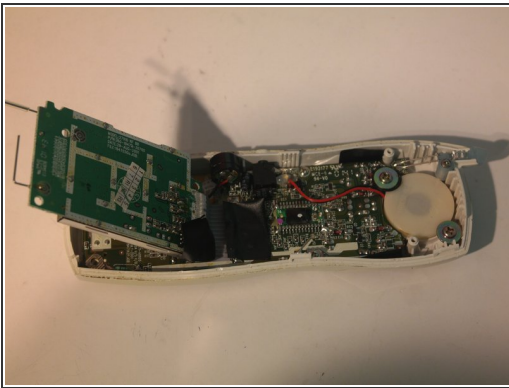
Step 6

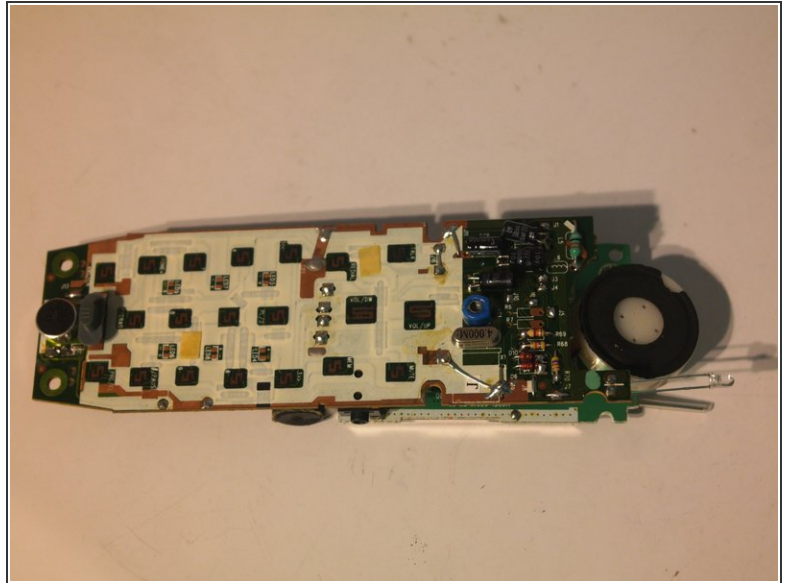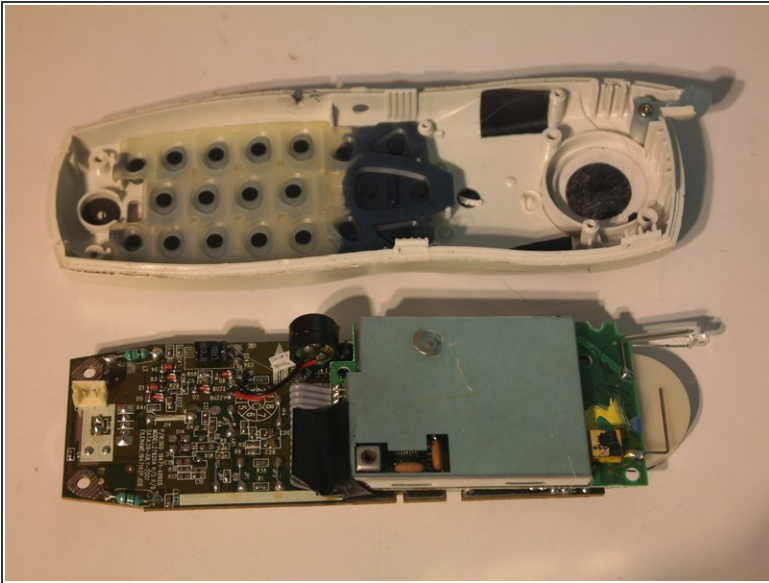- The charging contacts can now be easily removed.

Step 7

- Remove 2 screws on what appears to be the wireless board.
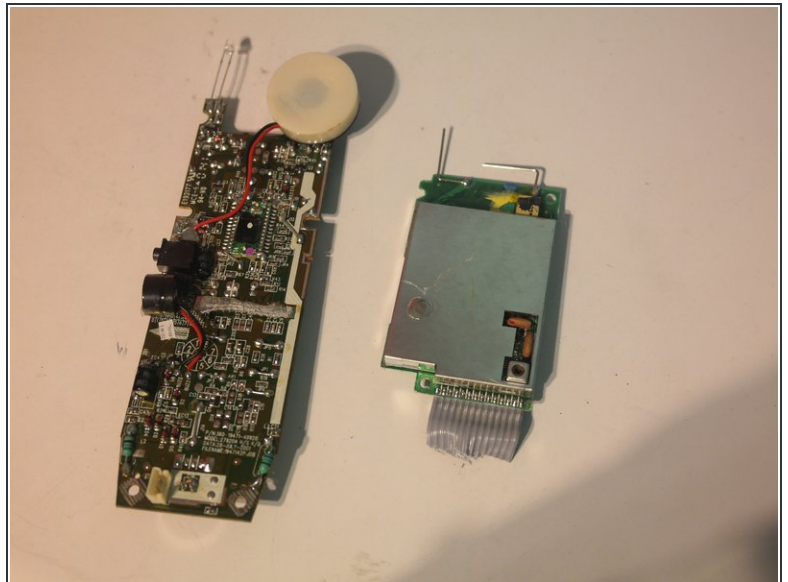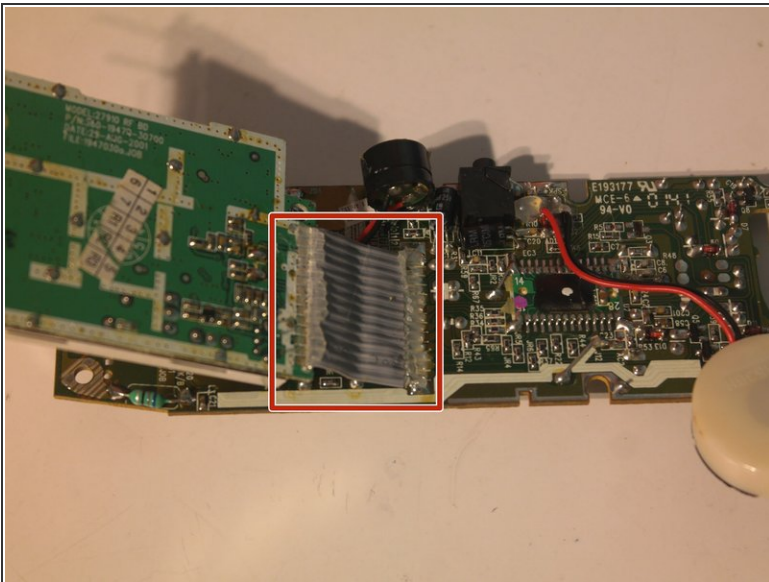
Step 8

- The wireless board can be flipped up, but is still attached to the main board by a short ribbon cable.

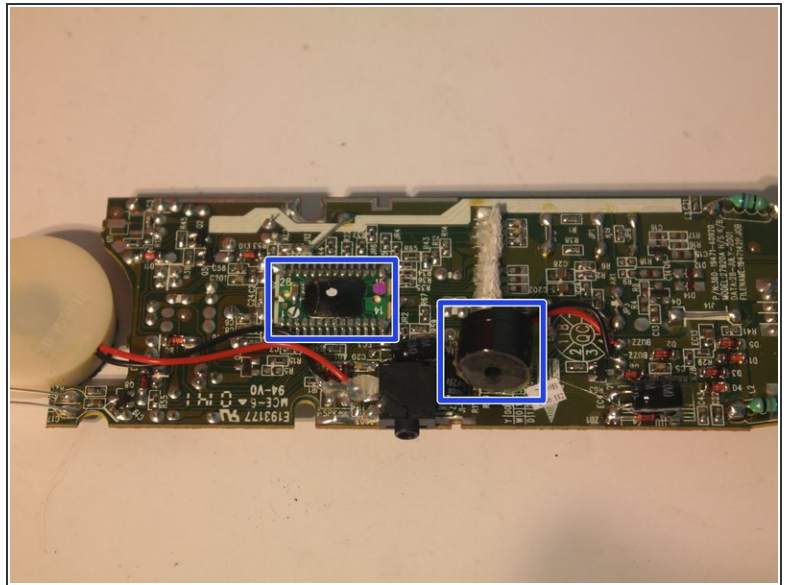- Remove 2 screws on the main board.

- Remove 2 screws on the speaker.

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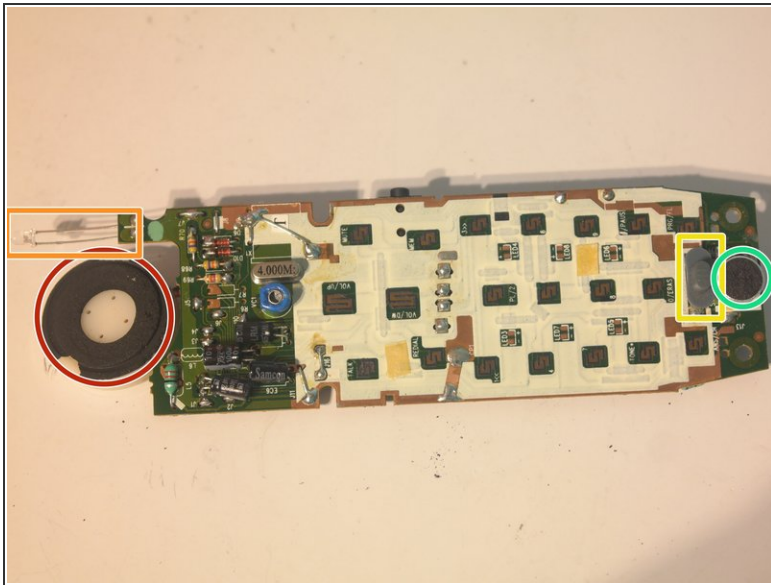
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Step 9

- The mainboard assembly can now be removed from the front case.

Step 10

- The wireless board is attached by a soldered and hot-glued in ribbon cable, which must be cut off to remove.

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Step 11

- Components on the main board:
 - Speaker
  - Message indicator LED
  - Ringer switch
  - Electret microphone
  - Unknown potted 'Blob' IC
  - Piezo buzzer for ringer

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Step 12

- Whoever designed the wireless module really didn't want anyone to know what was inside. The very thick EMI shield is **soldered, crimped, and epoxied on.**

- The shield took about 20 minutes to remove with diagonal cutters, 2 pairs of pliers, and 3 metal spudgers.

- Needless to say, the shield is irreversibly damaged and the wireless module will probably never work again.

Step 13
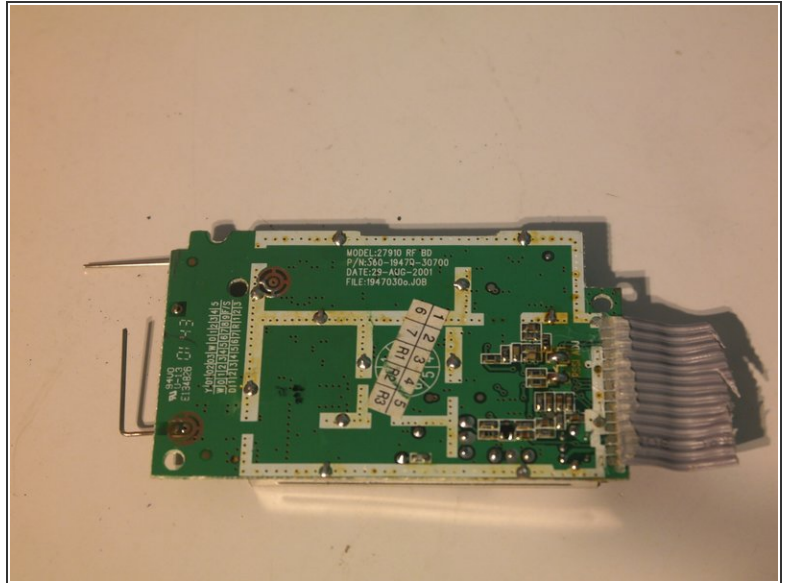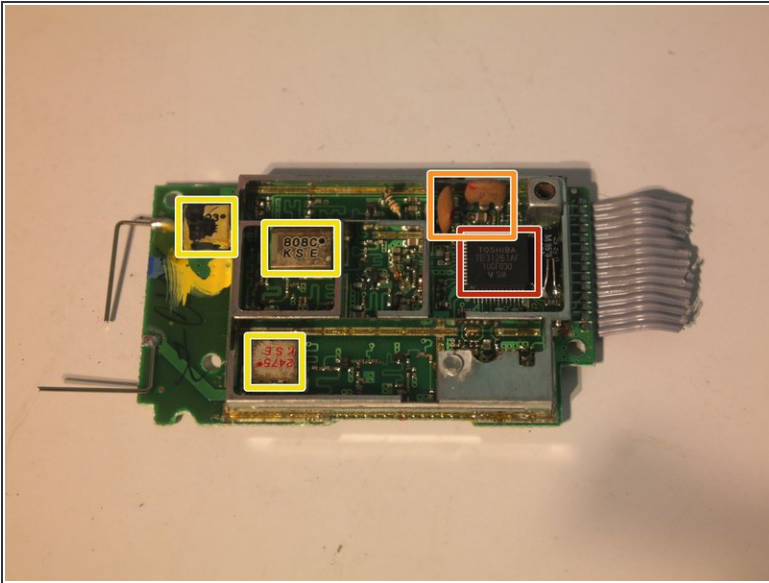
- Components inside the wireless module:
  - Toshiba [TB31261AF](#) cordless telephone RF chip
  - Ceramic resonators
  - Unidentified square ceramic components with 2 cylindrical holes in them horizontally (anyone who has an idea what they are, please comment.)

- The back of the board says that it was manufactured on August 29, 2001, making the phone 14 years old at the time of writing.

- Interestingly, the Toshiba TB31261AF is designed for a 900MHz cordless telephone, but this is a 2.4GHz model.

Step 14


Repairability Score:

6/10
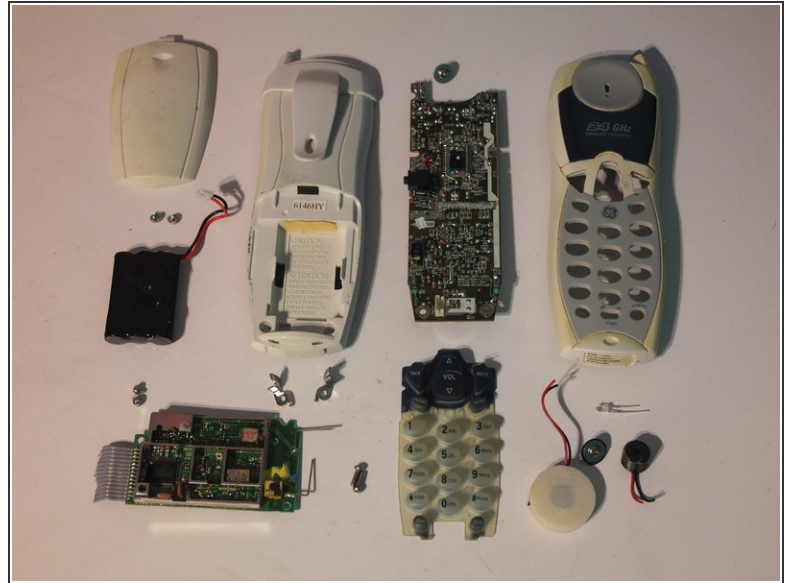
- Repairability score: 6/10

- Phone is held together with only phillips screws.

- Battery, the most likely part to fail, is a standard component and is easily replaceable.

- Case is difficult to open.

- Wireless module is very hard to replace and impossible to repair.

- All wires (except for the battery) are soldered to the circuit board instead of using connectors.
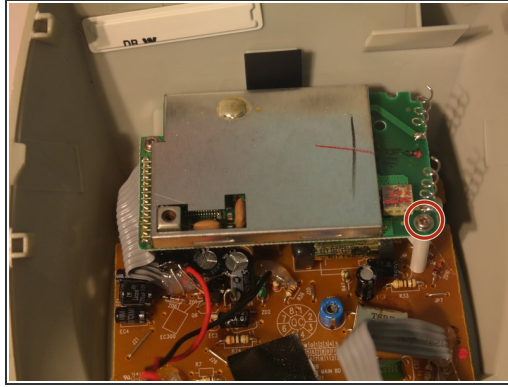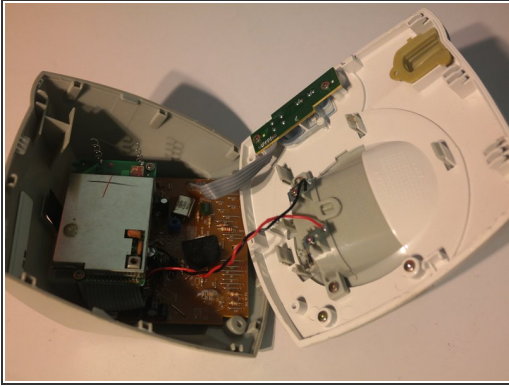
Step 15

- **Part II: The Secondary Base Station**

- Remove 2 phillips screws on the bottom.
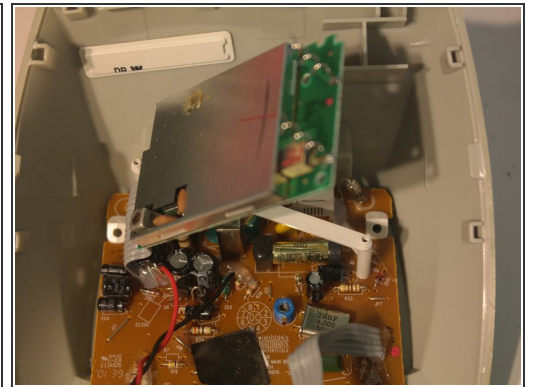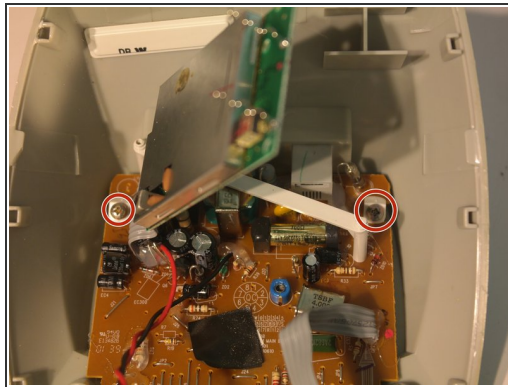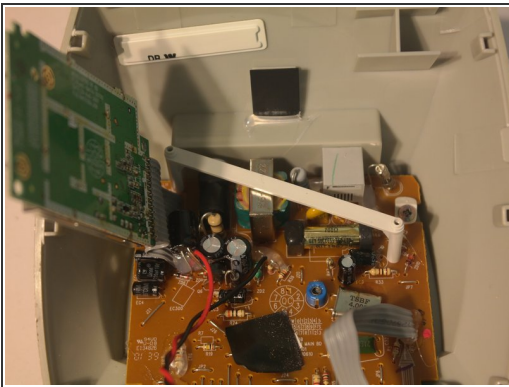
Step 16
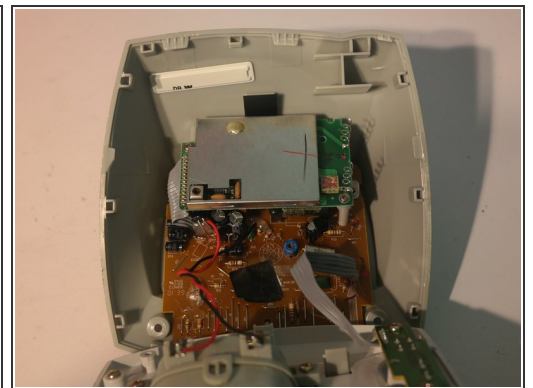
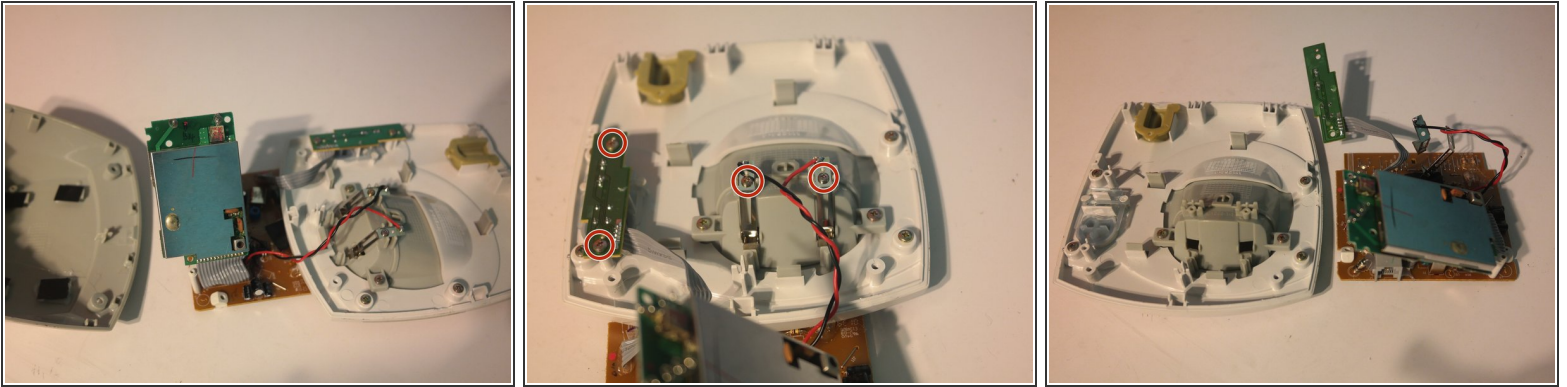- The top case can be removed with some spudgering.

Step 17

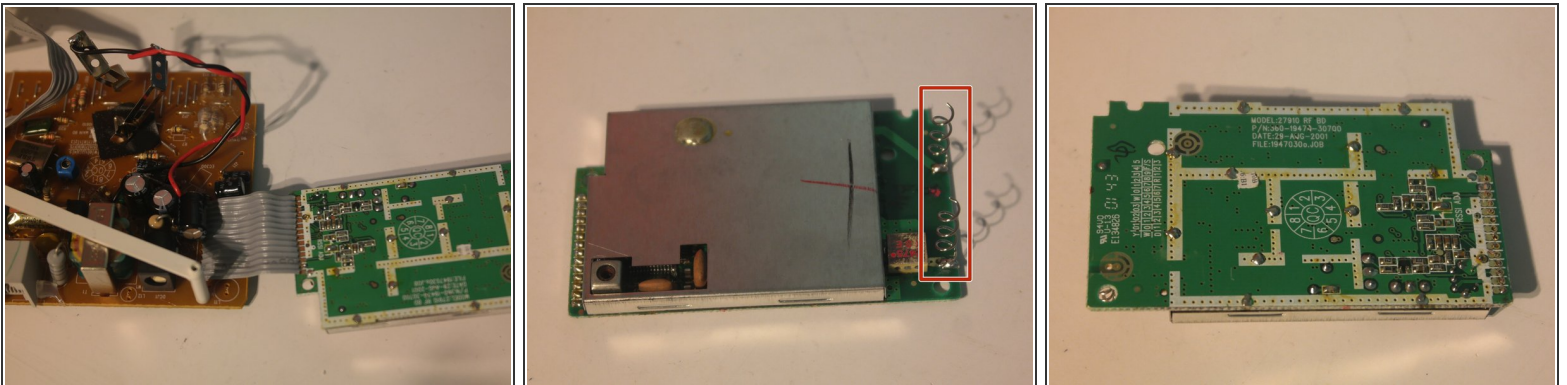- Remove 1 screw to remove the wireless module.

Step 18

- Just like in the handset, the wireless module is connected to the main board with a soldered ribbon cable. I'm sensing a theme here.

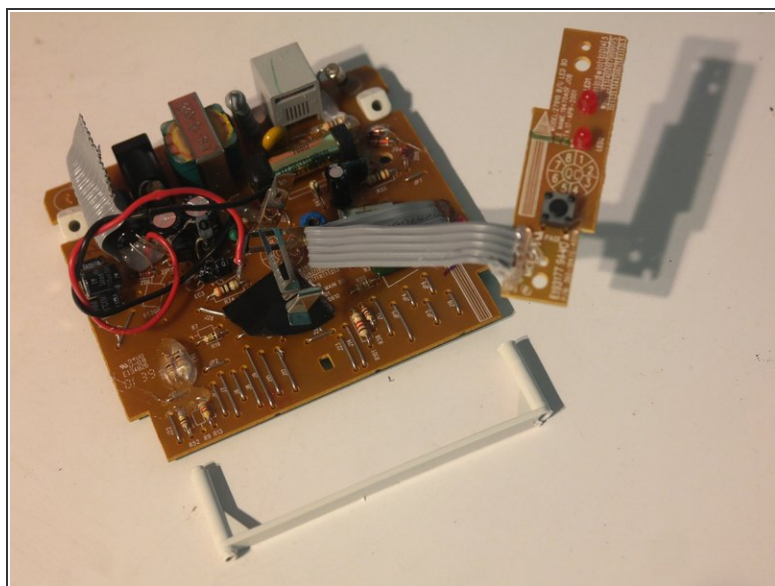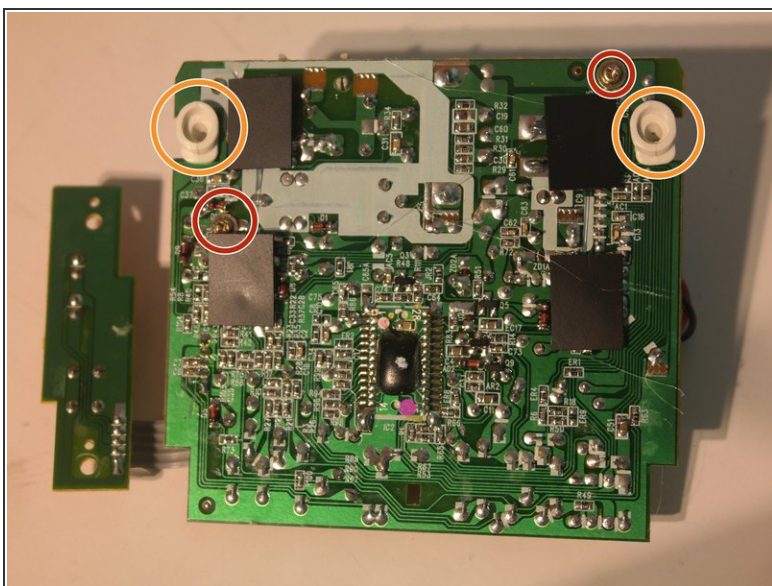- Remove 2 screws that hold down the main board.

Step 19

- The main circuit board can be removed from the bottom case.

- Remove 4 screws holding in the button board and charging contacts from the top case.
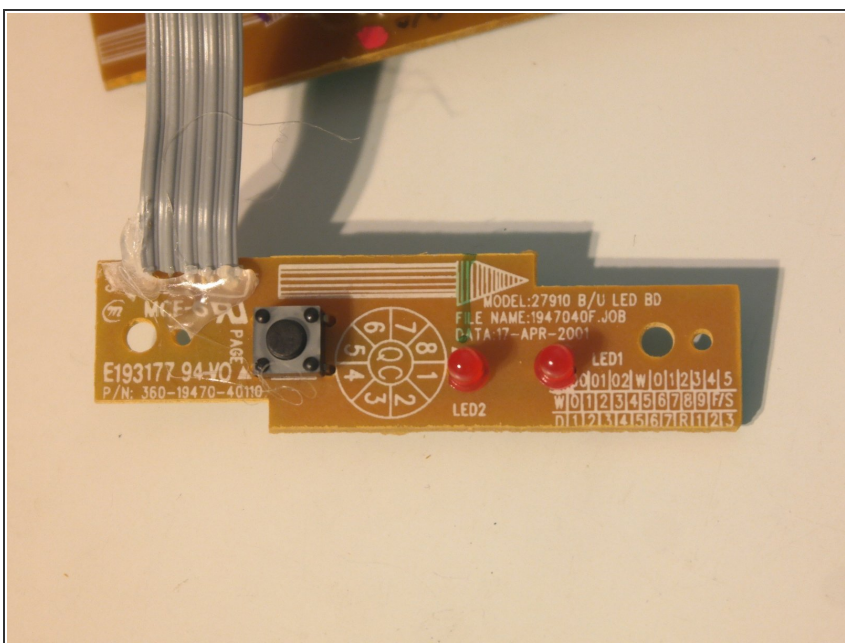
Step 20

- The wireless module can be cut away from the logic board.

- This wireless module is identical to the one in the handset except for the fact that it used coiled wires instead of straight wires for antennas.
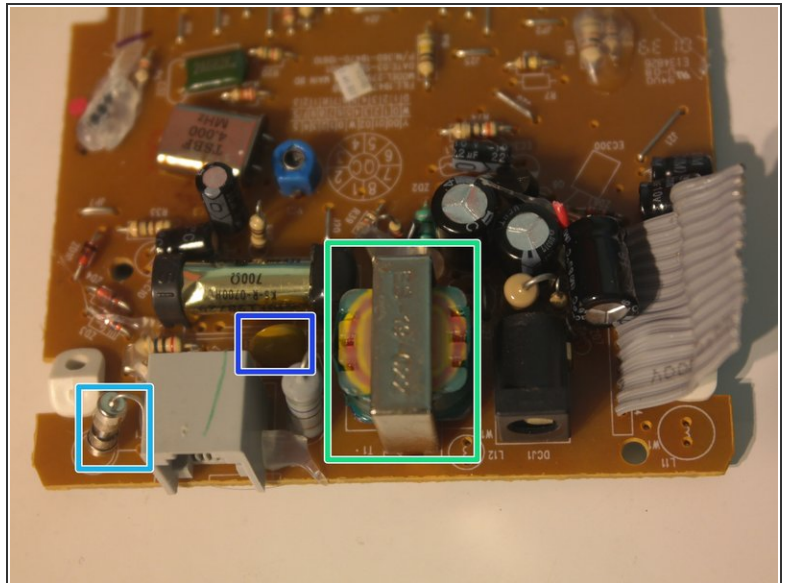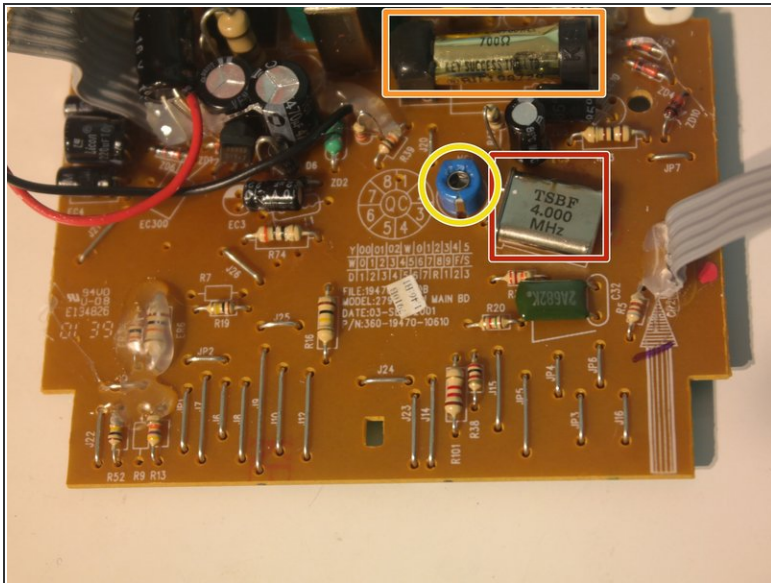
Step 21

- Remove 2 screws to remove the support for the wireless module.

- The plastic pieces used to hold down the board can also be removed.

Step 22

- The button board contains a lonely button, 2 LEDs, and is connected with a soldered ribbon cable reinforced with hot glue.

- This board appears to have been manufactured on April 17, 2001.

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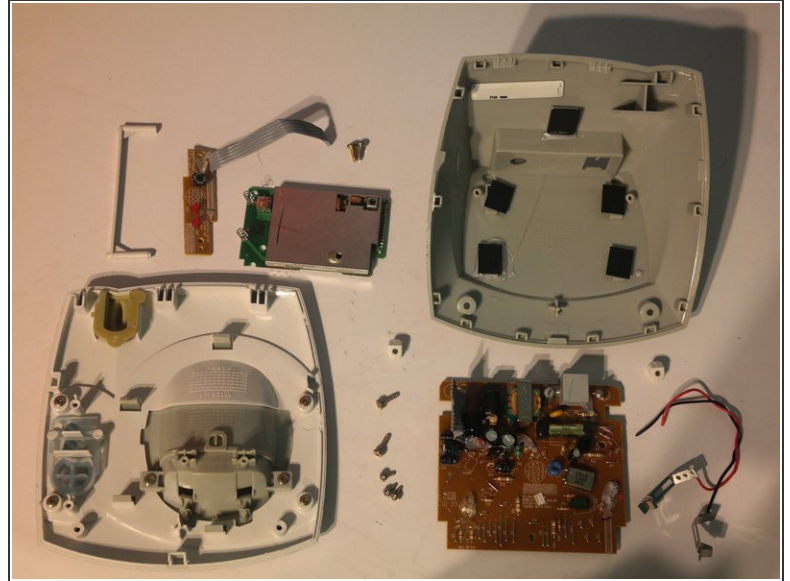
Step 23

- Components on the main board:
  - 4 MHz crystal
  - [Reed relay](#)
  - Variable capacitor
  - Small audio transformer
  - Miniature fuse
  - Varistor for surge protection
- This board was manufactured on September 3, 2001.

Step 24

- Repairability Score: 4/10
  - Secondary base station is assembled with only phillips screws.
  - Circuit boards use mainly through-hole parts, so repair of individual components is easier.
  - Case requires lots of spudgering to open.
  - Removing the board requires a long screwdriver.
  - Wireless module is very hard to replace and impossible to repair.
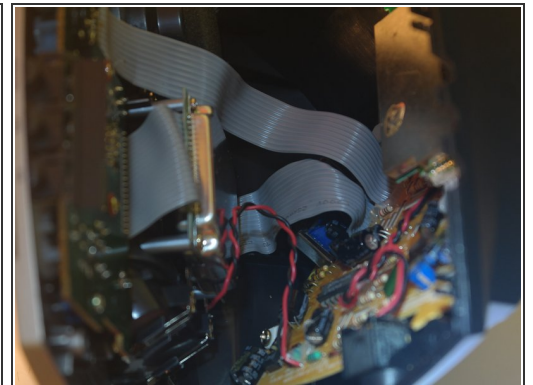 - All wires and ribbon cables are soldered to the board and reinforced with hot glue.

Step 25

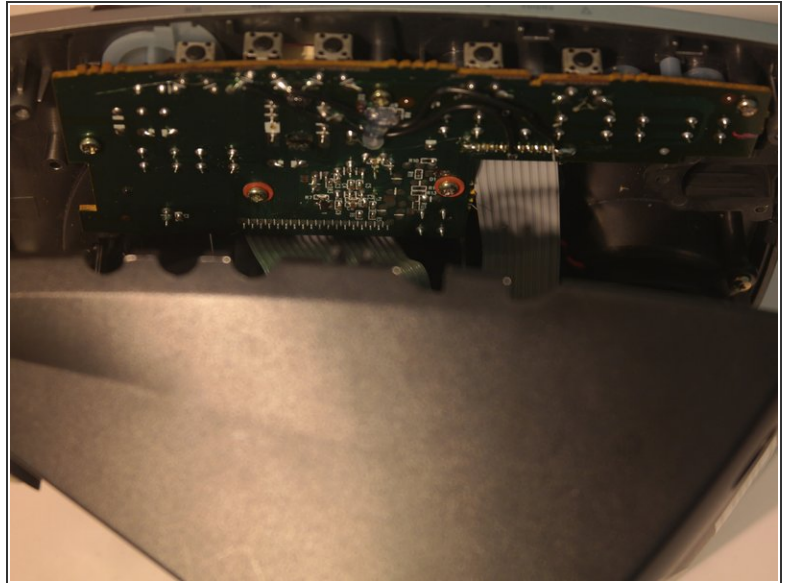- **Part III: The Main Base Station**
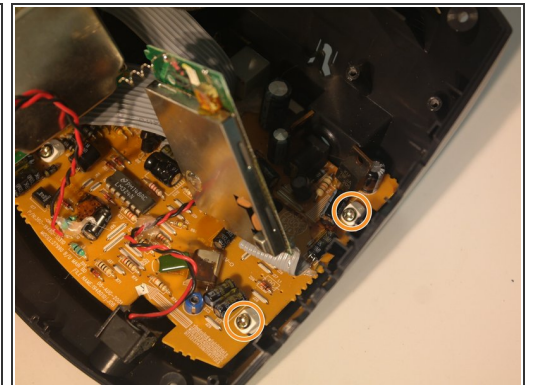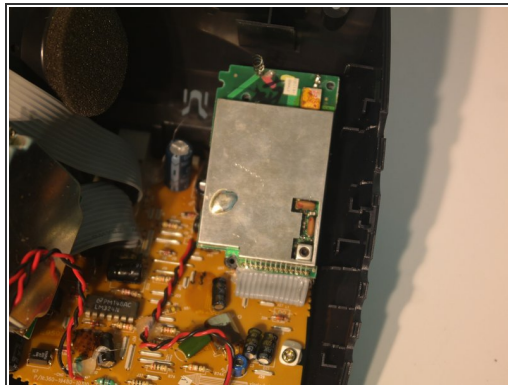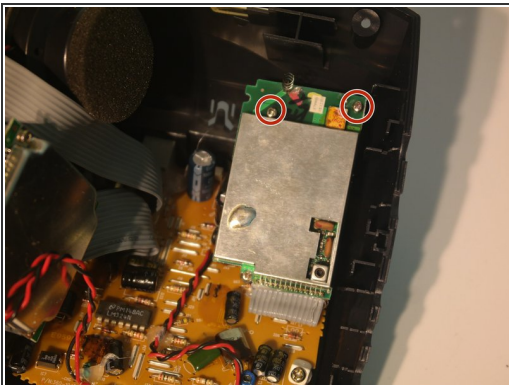
- First step: remove 4 screws.

Step 26

- The case for the main base station can be opened, but it requires 2 spudgers and much more force than the other one.

- Remember how I said soldered ribbon cables were becoming a theme here? I was right.

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Step 27

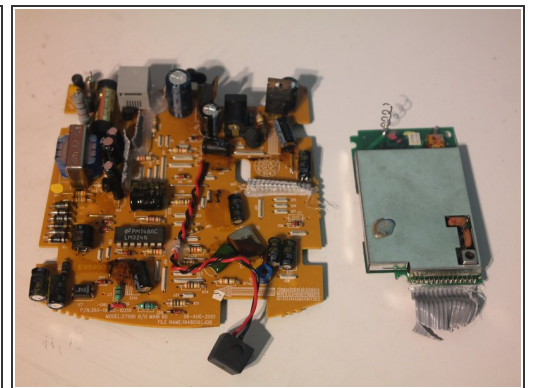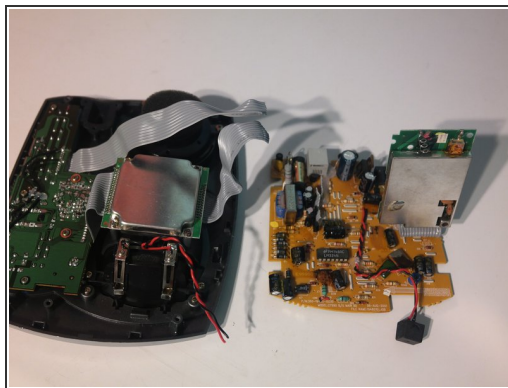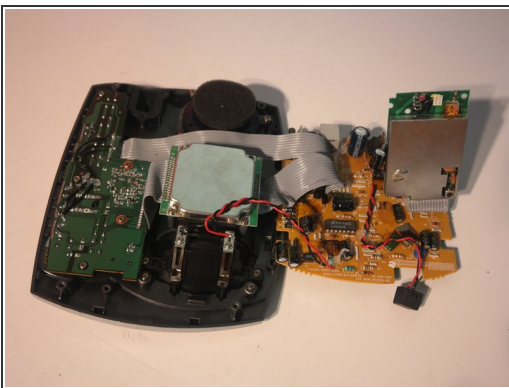- Remove the buttons from the side of the case.

Step 28

- Remove 2 screws holding down the wireless module.

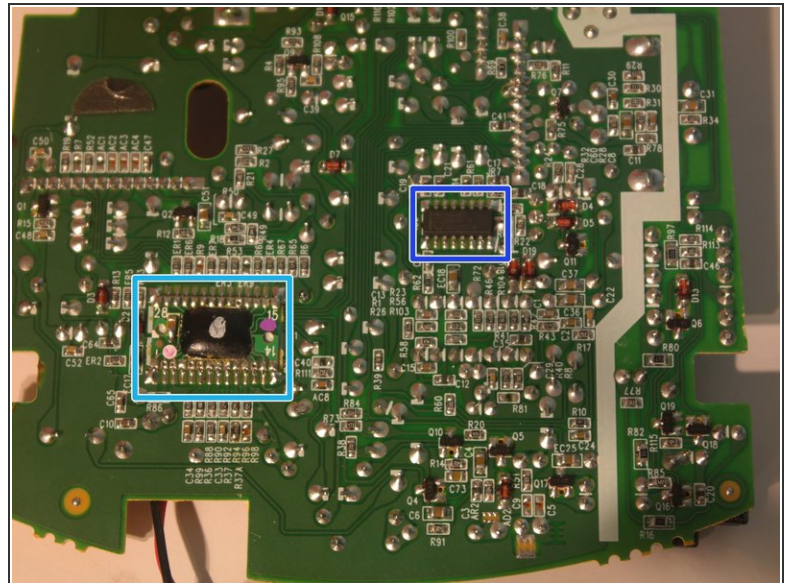- Remove 2 more screws holding down the plastic pieces attached to the circuit board.

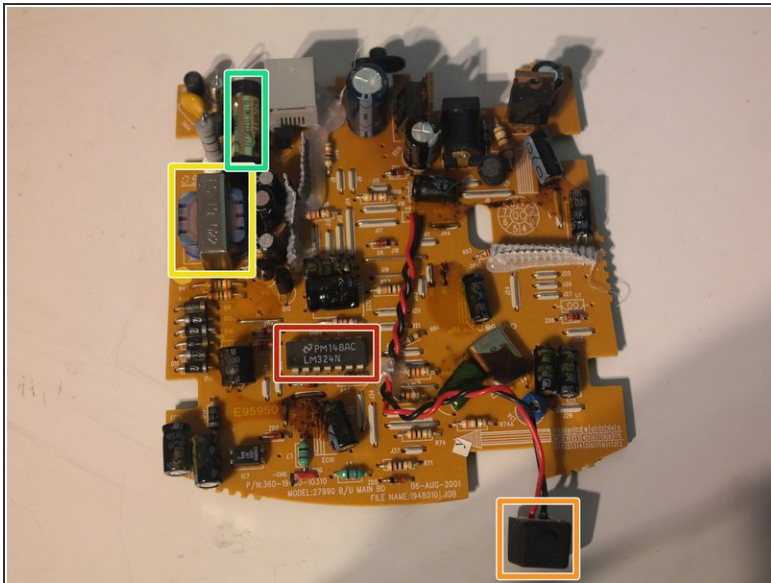This document was generated on 2020-12-09 08:56:15 AM (MST).

Step 29
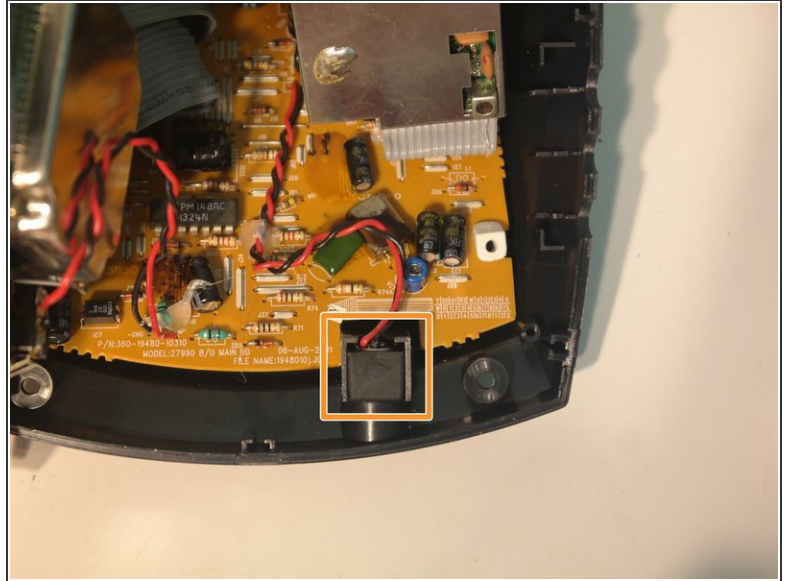
- Remove another 2 screws on the other side of the board.

- Remove the microphone from its holder.

Step 30

- In order to remove the board from the bottom case, you have to carefully reach in and free each one of the plastic pieces attached to the board from a clip on the bottom case.

- All of the cables to the main board can now be cut and the wireless module can be cut off of the main board.

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Step 31


- Components on the main board:
  - LM324 Quad Operational Amplifier
  - Electret microphone
  - Small audio transformer
  - Reed relay
  - Same potted 'Blob' IC found in the handset
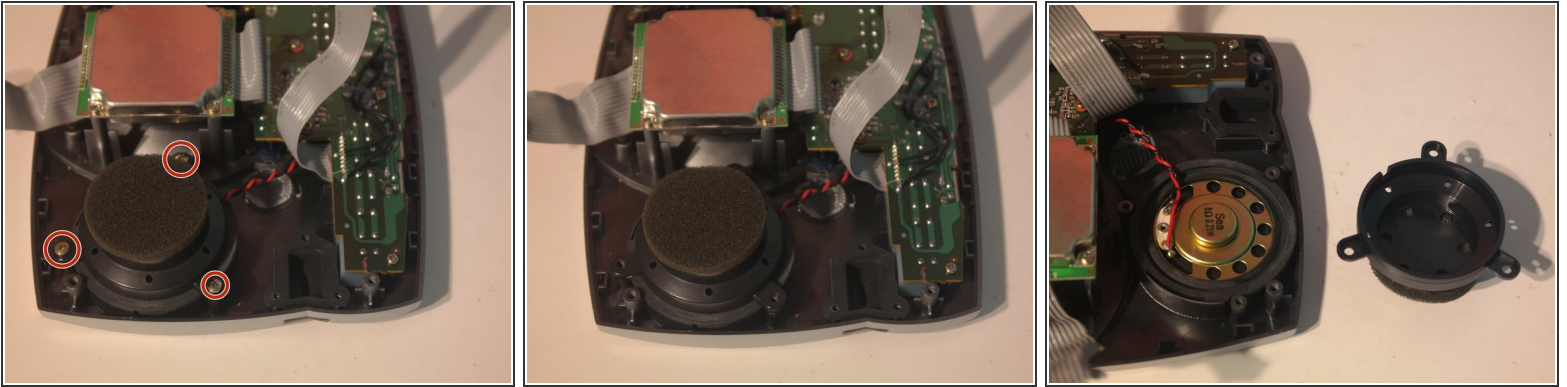 - HEF4053 triple SPDT analog switch

Step 32
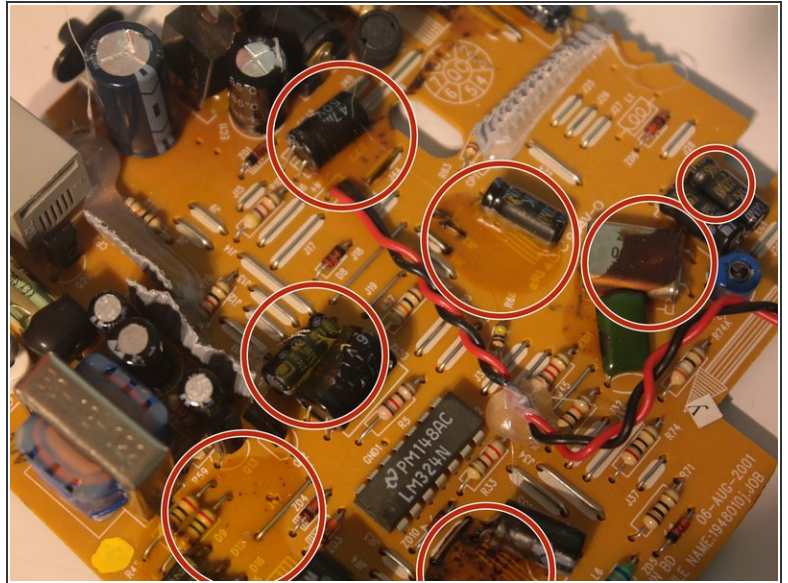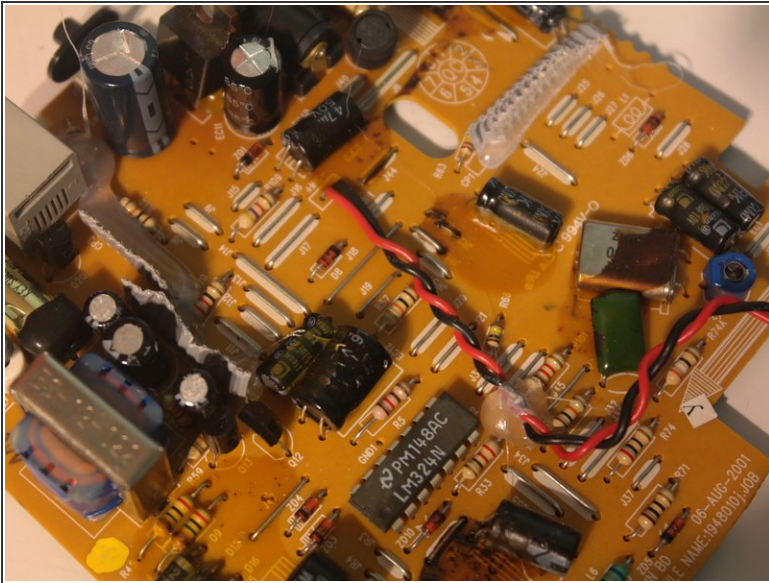
- The main board in the base station has patches of an unknown yellowish-brown substance on it that appears to be some kind of weak adhesive, and it seems to be scattered in no obvious pattern.

Step 33
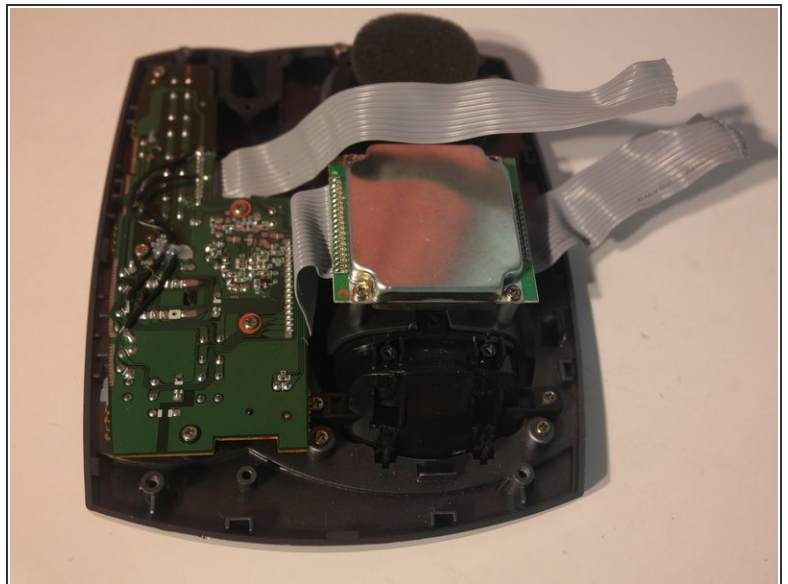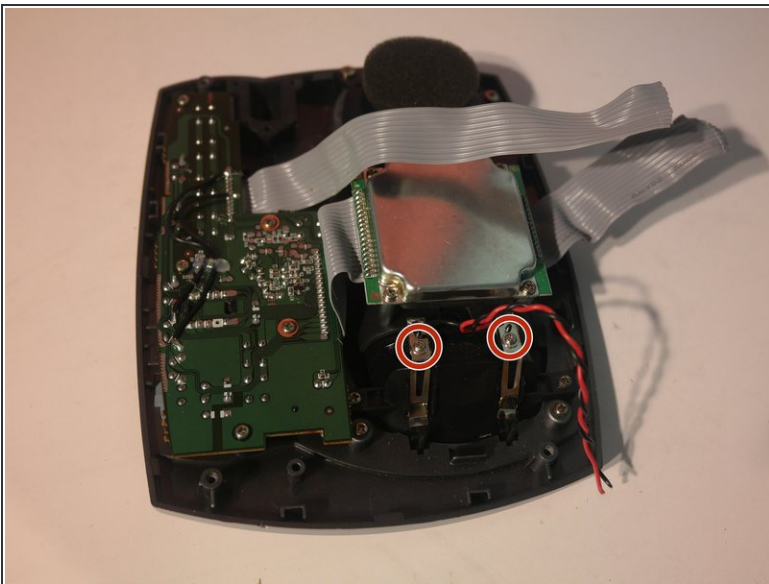
- Remove 2 screws to remove the charging contacts in the upper case.

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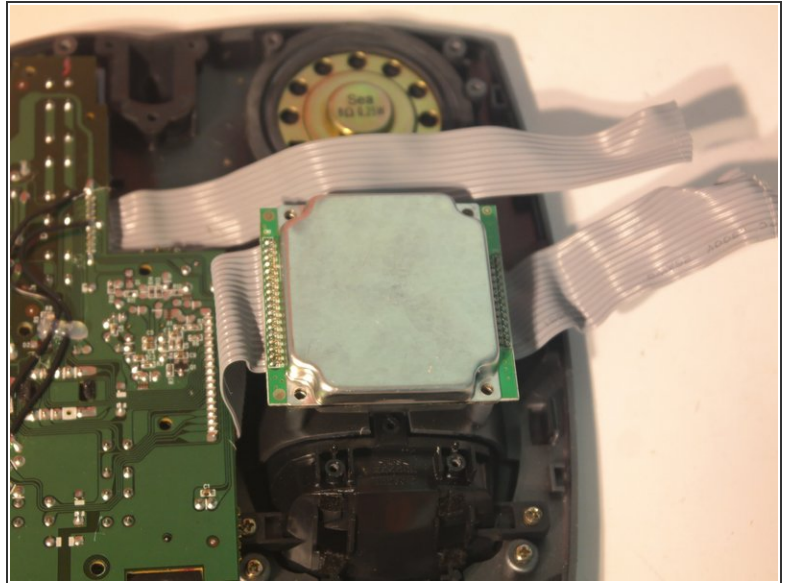
Step 34

- Remove 3 screws to remove the speaker cover.

- This speaker cover appears to have been designed to accomodate both a low-profile speaker and a speaker with a larger magnet on the back.

Step 35
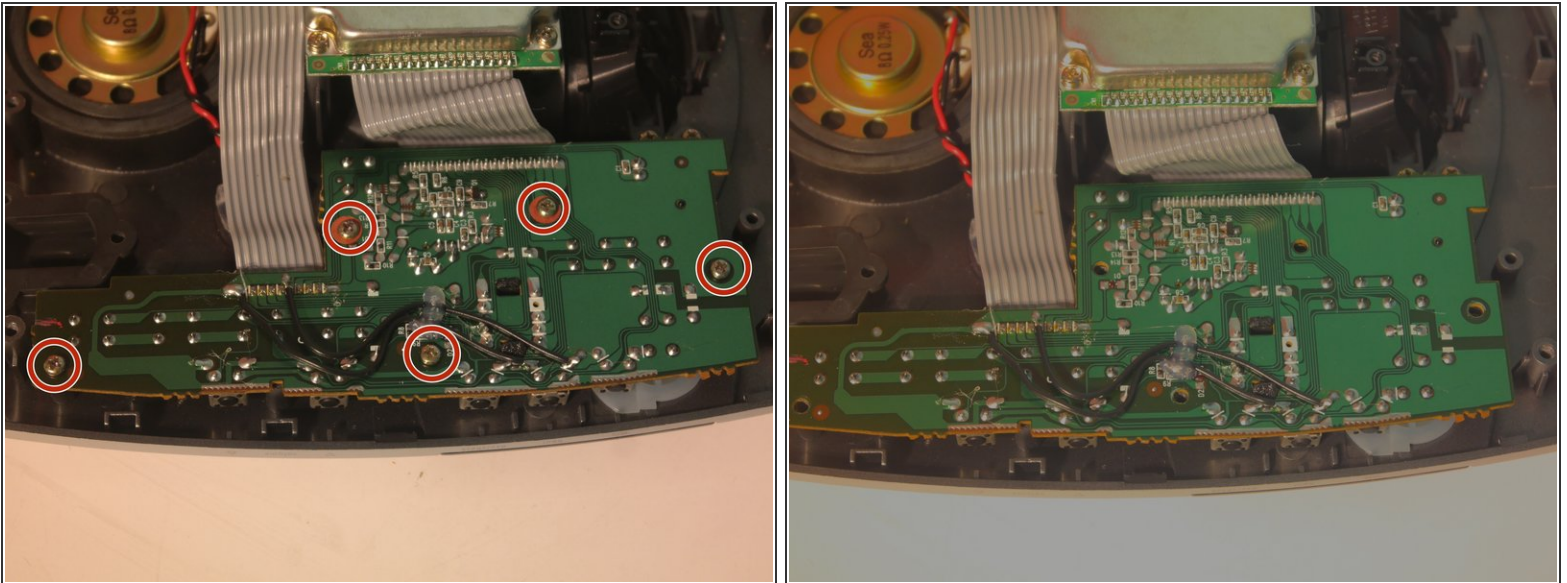
- The upper case board can be removed by removing 5 screws.

Step 36
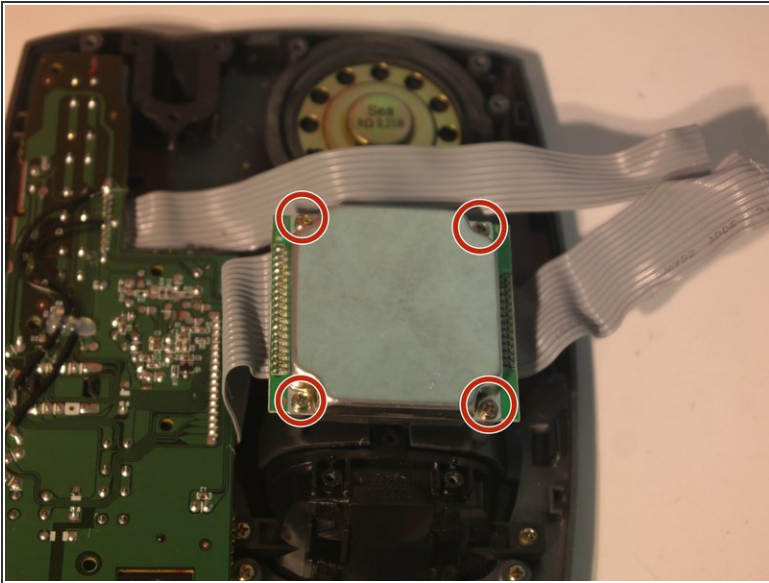
- Remove 4 screws on the mysterious metal box.

Step 37

- The entire top case assembly can be removed from the printer after using a spudger to free the large buttons from clips in the top case.

Step 38
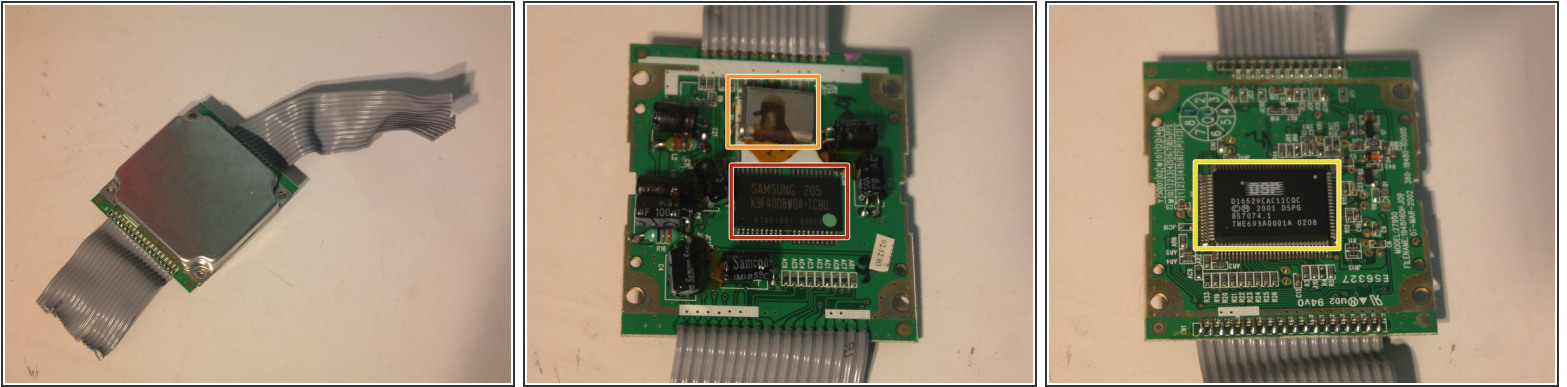
- So what is inside the mysterious metal box?

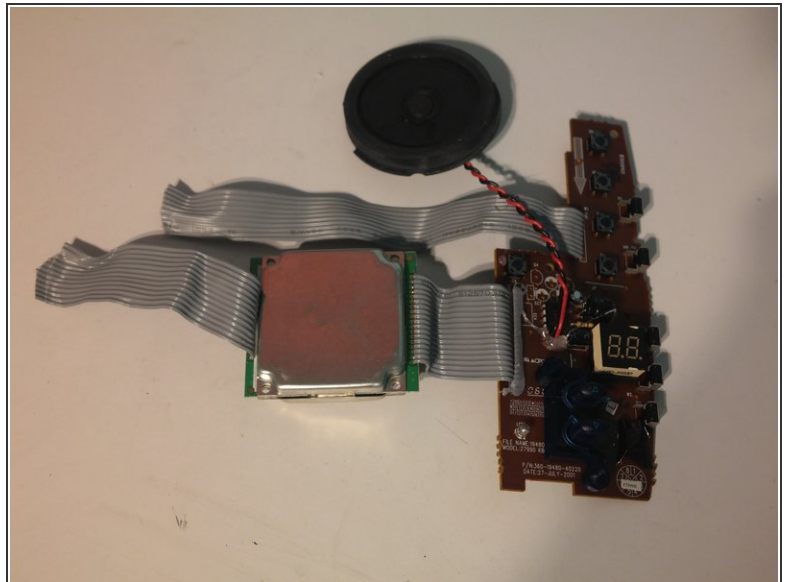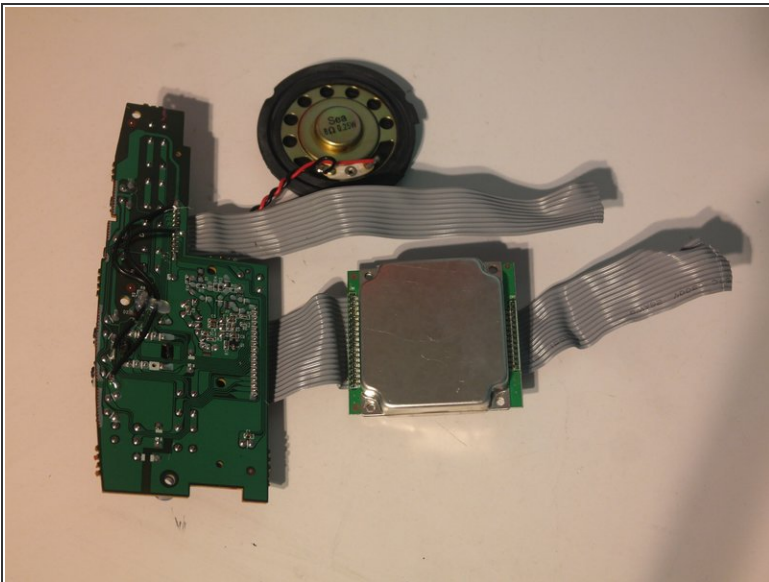 - Samsung K9F4008W0A-TCB0 512x8 Kb (512 KB) flash memory (designed for digital audio recording)

  - Crystal oscillator, covered in the same unusual substance found on the main board.

  - Unknown IC D16529CAC11CQC. Googling it turns up nothing that makes any sense.

  - This board is probably where the messages are stored.

Step 39
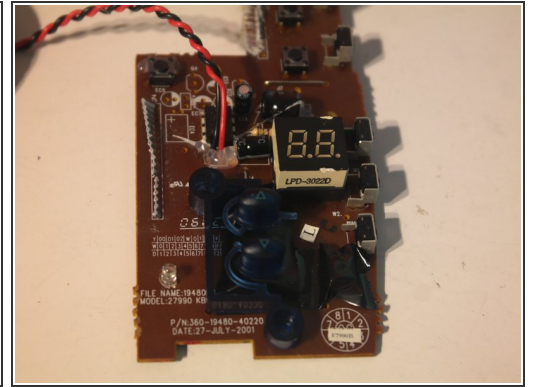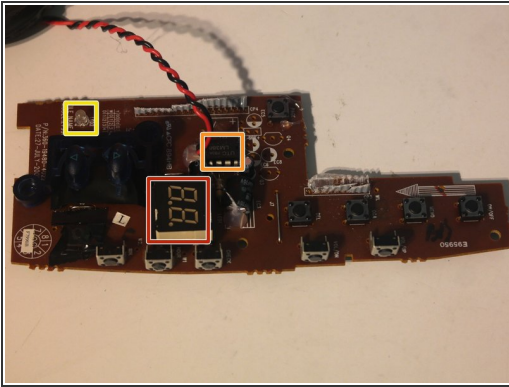
- The major components on the top case board:
  - Dual 7-segment display
  - [LM386](#) audio amplifier
  - Message indicator LED
- This board was manufactured on July 27, 2001.
- The speaker is a standard 2" low profile 8 ohm 0.25 watt speaker.

Step 40
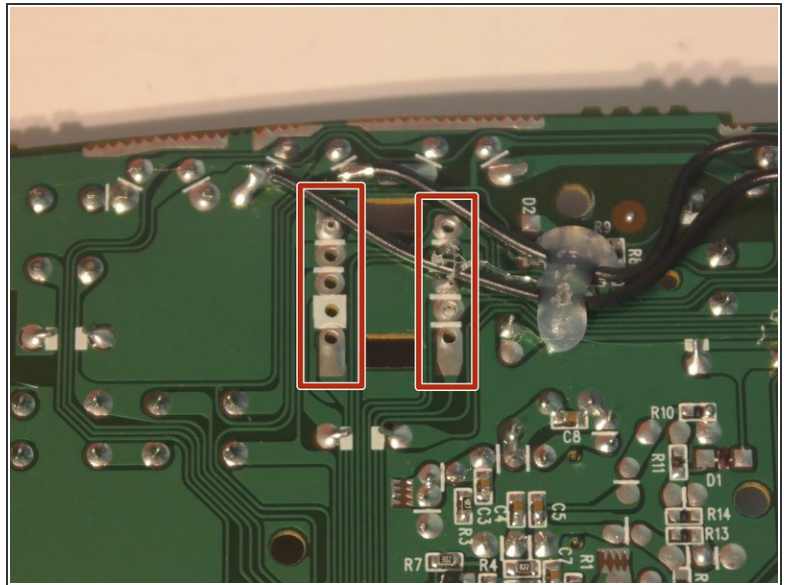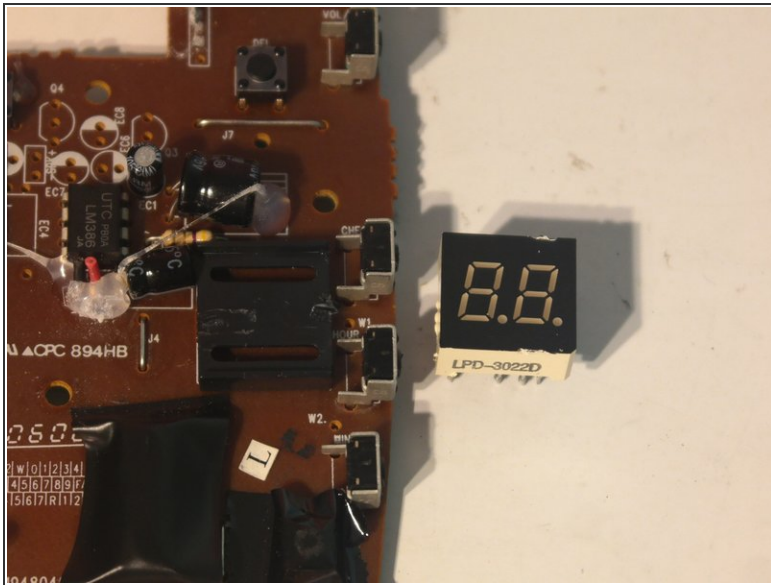
- All of the boards in this phone system have **terrible** solder quality. I was able to cleanly remove the 7-segment display, about 20 capacitors, 3 voltage regulators, 1 transformer, and 2 crystal oscillators without damaging them using needle nose pliers.

Step 41

Repairability Score:

3/10

- Repairability Score: 3/10

- Base station is only held together with phillips screws.

- Circuit boards use mainly through-hole parts, so repair of individual components is easier.

- Removing the top circuit board is difficult because the buttons are attached to the top case with clips.

- Opening the case requires 2 metal spudgers and a lot of force.

- Removing the bottom circuit board is difficult because the case is still attached with soldered ribbon cables.

- Wireless module is very hard to replace and impossible to repair.

- All wires and ribbon cables are soldered to the board and reinforced with hot glue.

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Step 42

Repairability Score:

5/10

- Overall repairability score: 5/10

- The handset battery, the most likely part to fail, is a standard component and is easily replaceable.

- Circuit boards use mainly through-hole parts, so repair of individual components is easier.

- Entire phone is held together with phillips screws

- Cases are difficult to open and require heavy spudgering.

- Most parts were not designed to be repaired.

- All wires and ribbon cables are soldered to the board and reinforced with hot glue.