



# GE 27990G3 Cordless Phone Teardown

Full teardown of a cordless phone from 2001.

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# 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)
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## Step 1 — GE 27990G3 Cordless Phone Teardown



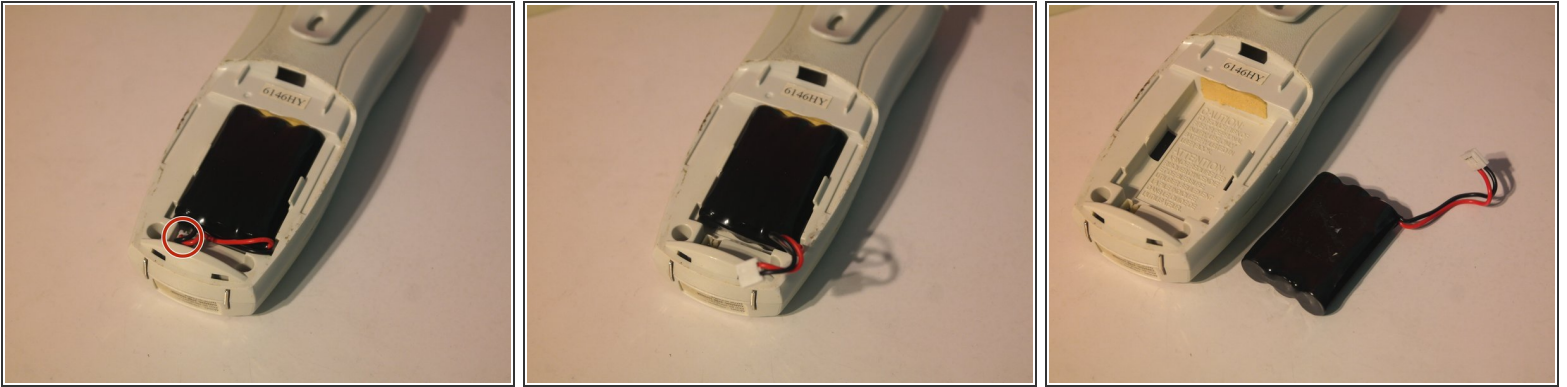
- This is a teardown of a GE 27990G3 cordless phone system from 2001. Sadly, while it still works, its 2.4 GHz wireless transmitter interferes with WiFi.

## Step 2



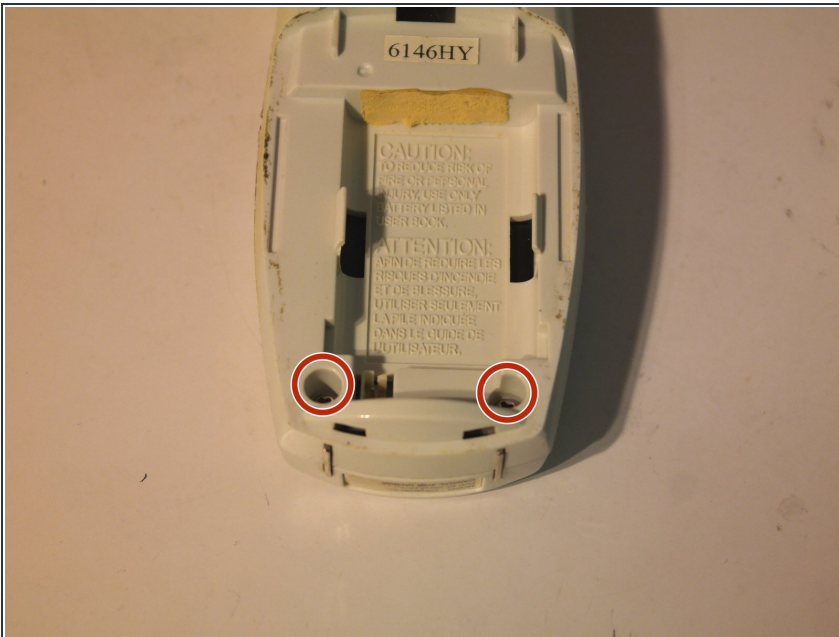
- **Part I: The Handset.**
- Remove the battery door on the back.

## 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.

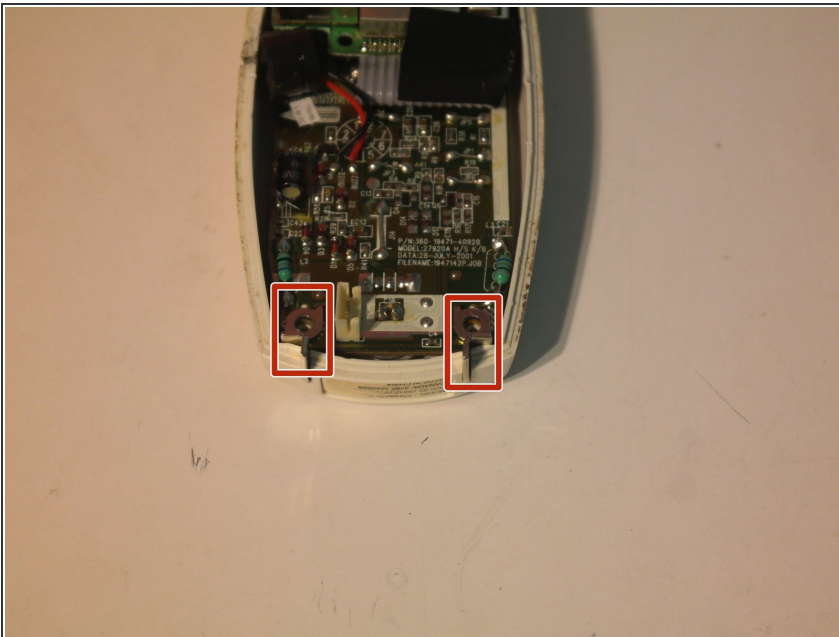


## Step 5



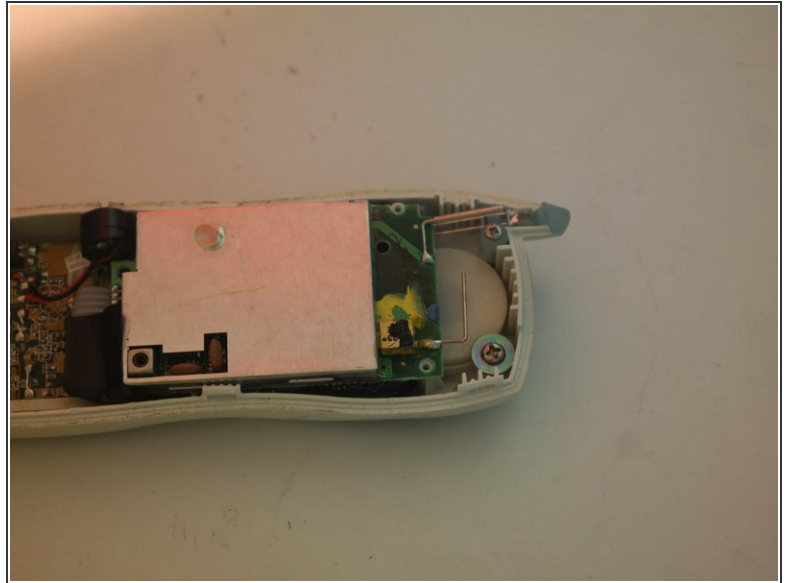
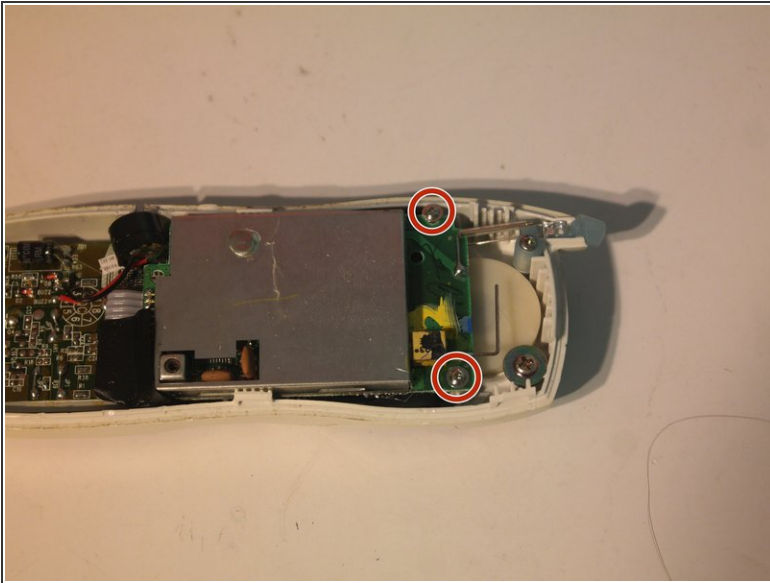
- After some aggressive spudgering (the pictures make it look much easier), the back of the case can be removed.

## Step 6



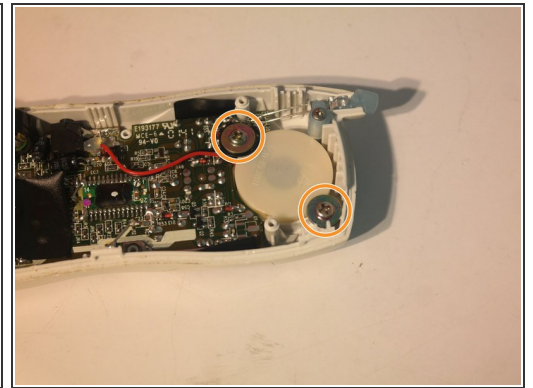
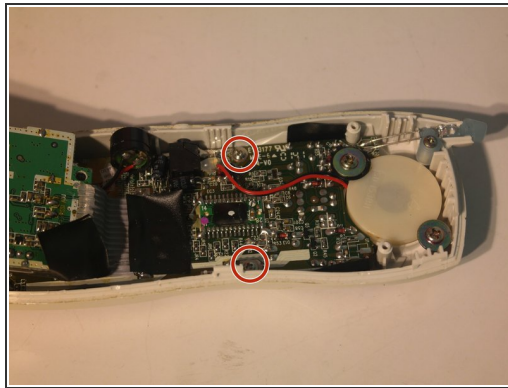
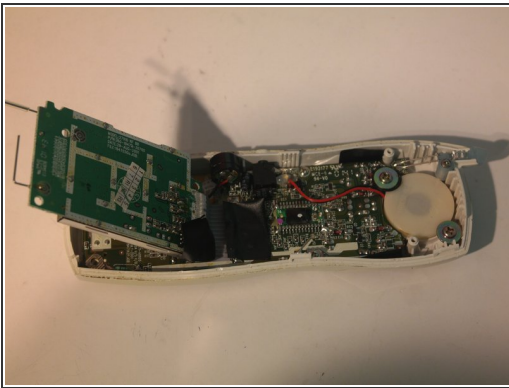
- The charging contacts can now be easily removed.

## Step 7



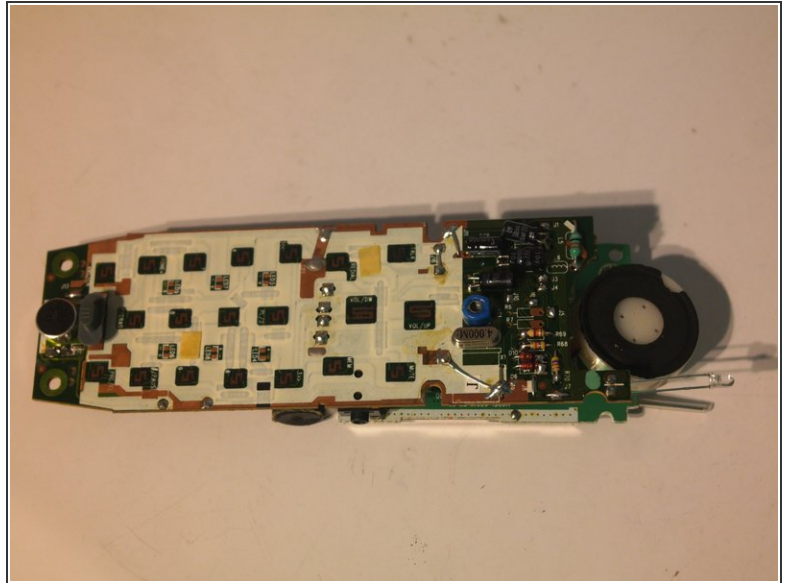
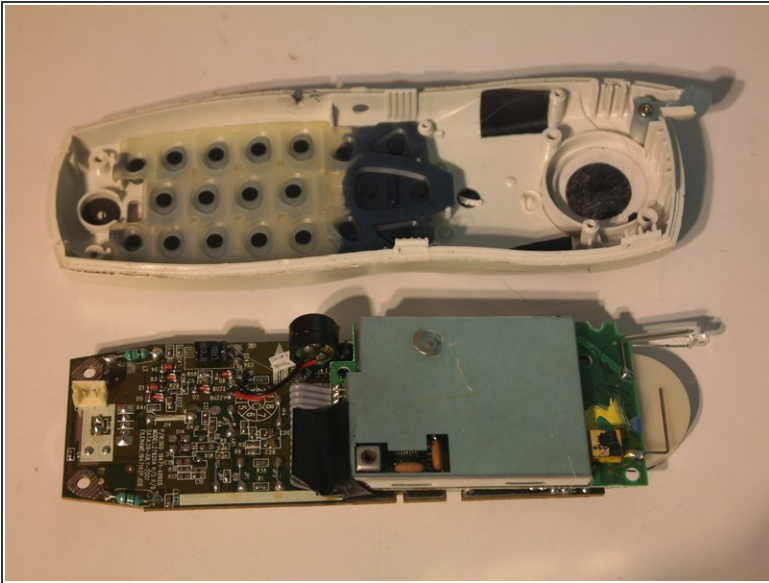
- Remove 2 screws on what appears to be the wireless board.

## Step 8



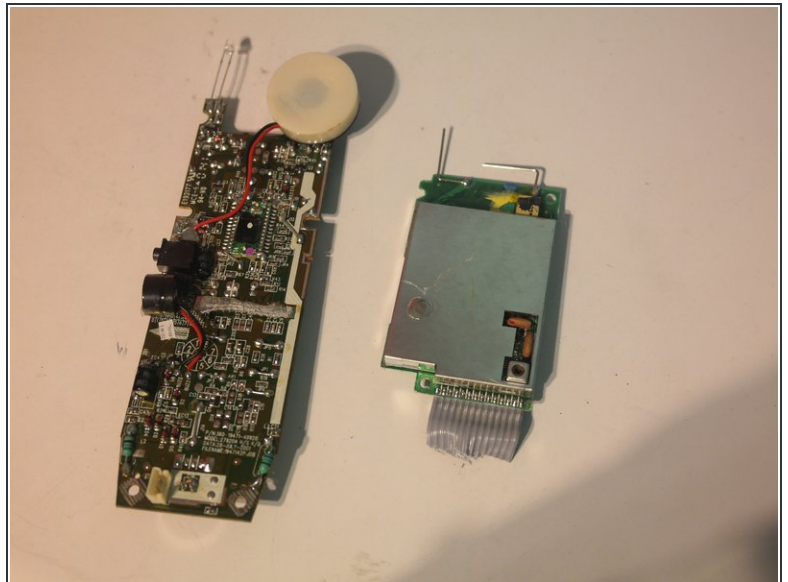
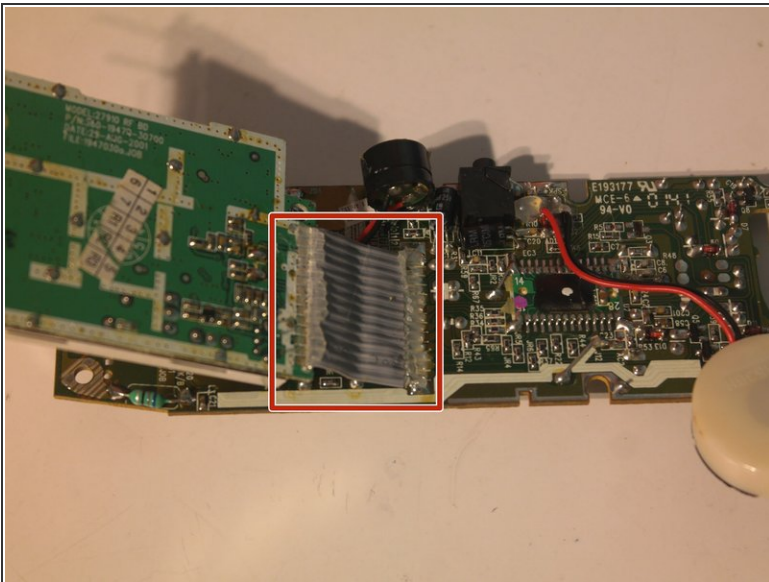
- The wireless board can be flipped up, but is still attached to the main board by a short ribbon cable.
- Remove 2 screws on the main board.
- Remove 2 screws on the speaker.

## Step 9



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

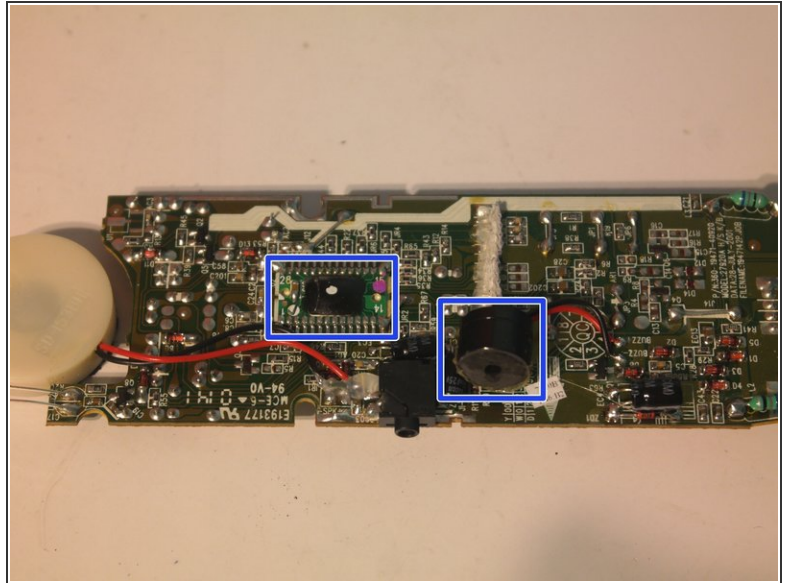
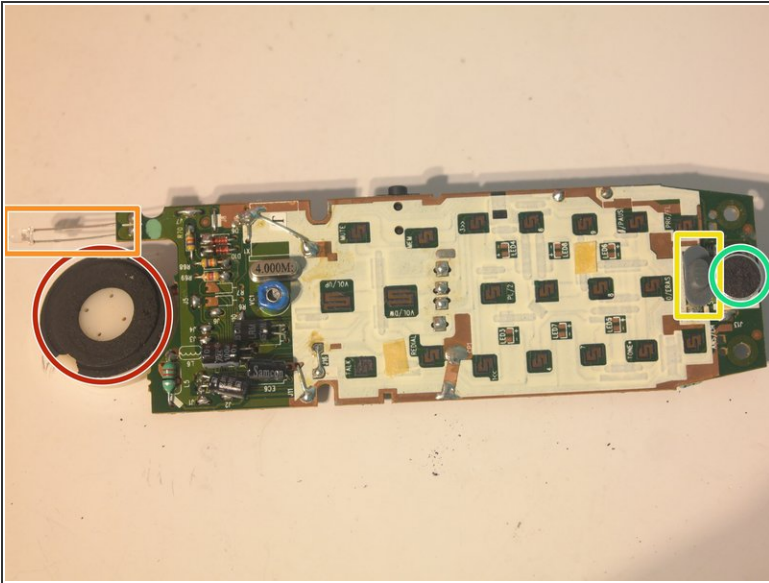
## Step 10



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



## Step 11



### ● Components on the main board:

- Speaker
- Message indicator LED
- Ringer switch
- Electret microphone
- Unknown potted 'Blob' IC
- Piezo buzzer for ringer

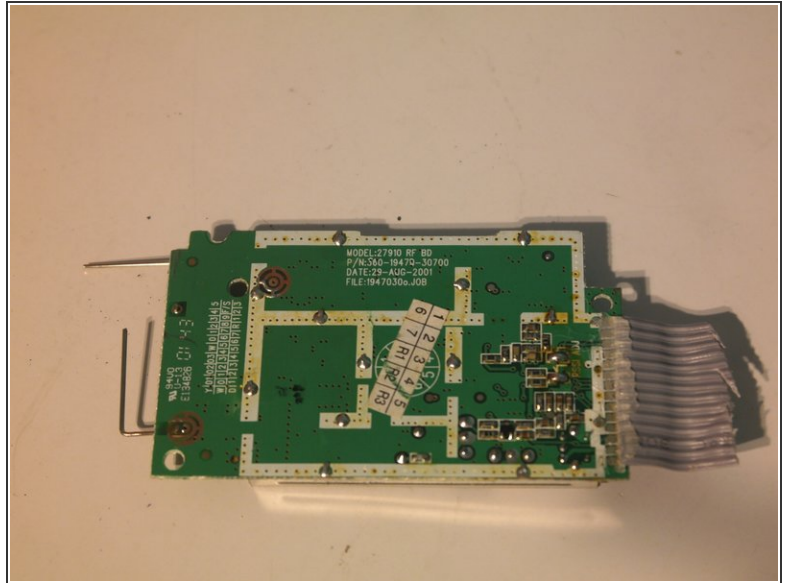
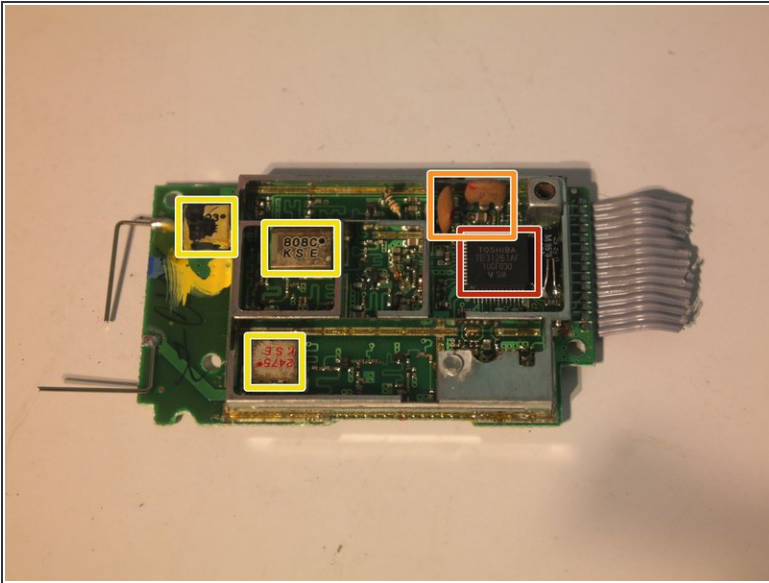


## Step 12



- 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

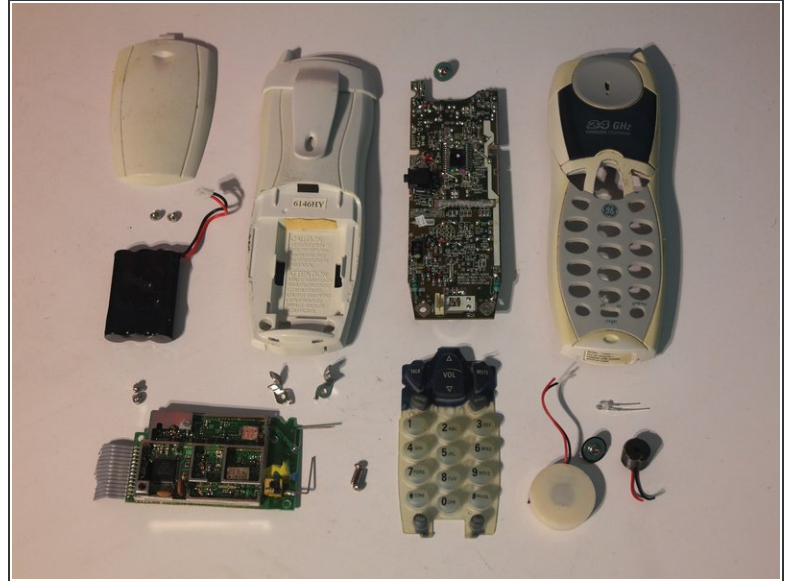


- Components inside the wireless module:
  - Toshiba [TB31261AF](#) cordless telephone RF chip
  - Ceramic resonators
  - Unidentified square ceramic components with 2 cylindrical holes in them horizontally (anyone who has an idea what they are, please comment.)
- The back of the board says that it was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

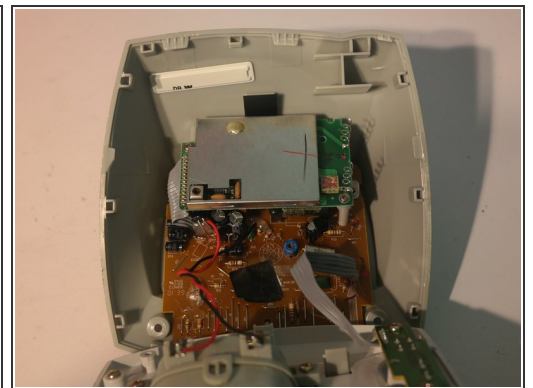


## Step 15



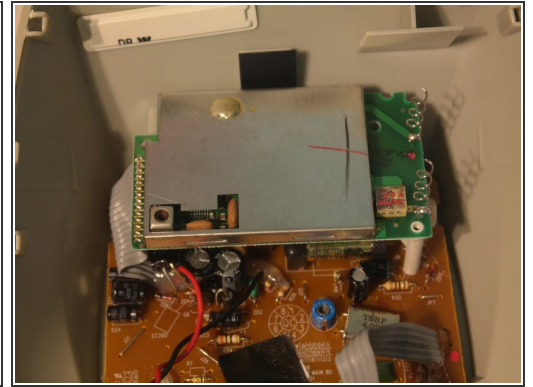
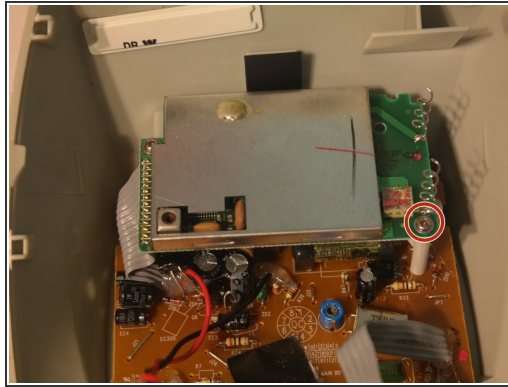
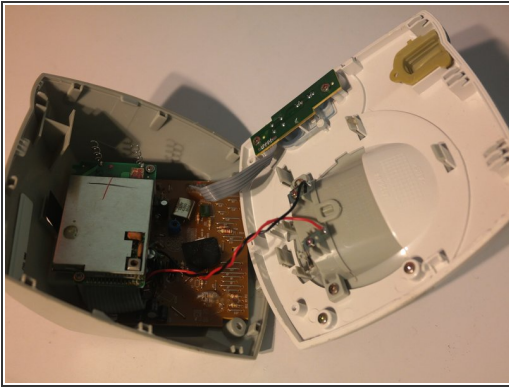
- **Part II: The Secondary Base Station**
- Remove 2 phillips screws on the bottom.

## Step 16



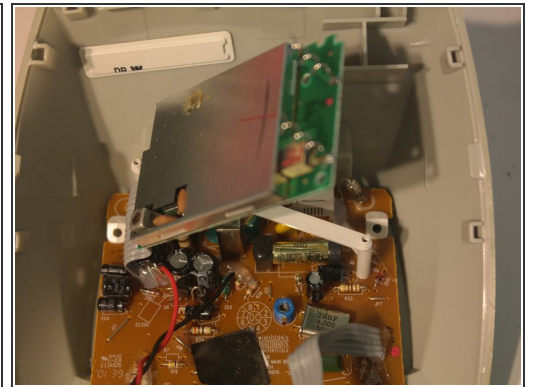
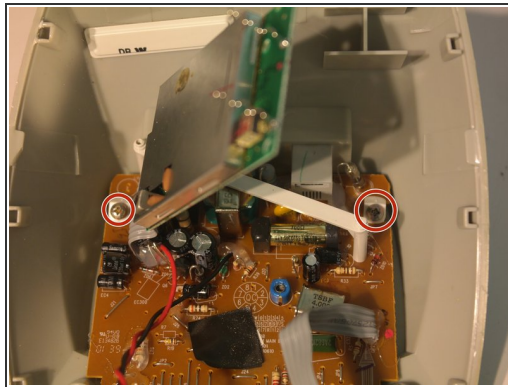
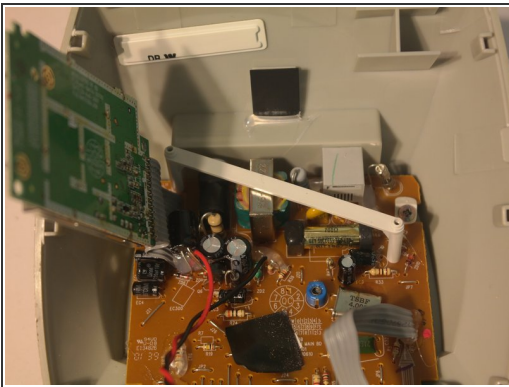
- The top case can be removed with some spudgering.

## Step 17



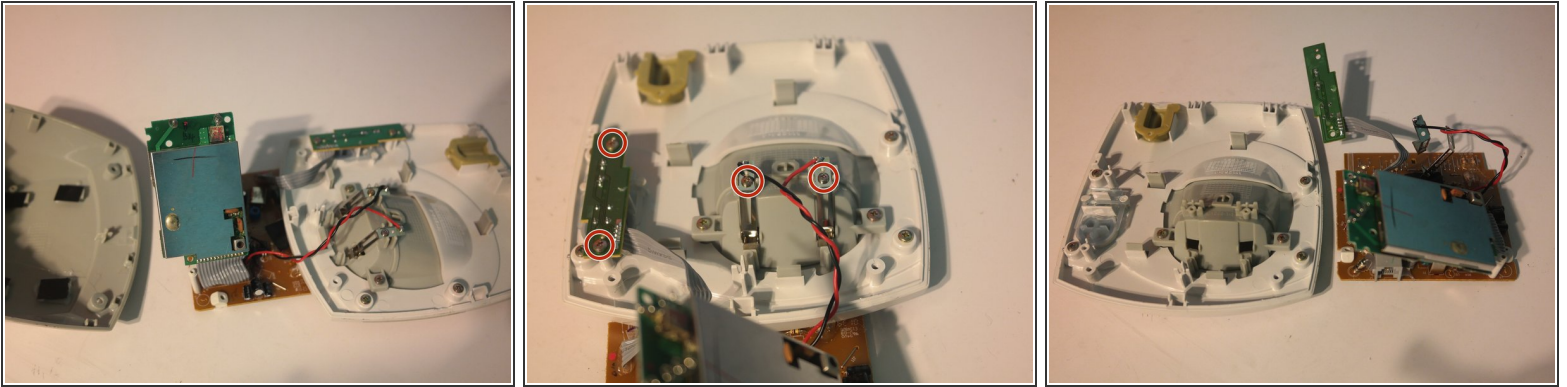
- Remove 1 screw to remove the wireless module.

## Step 18



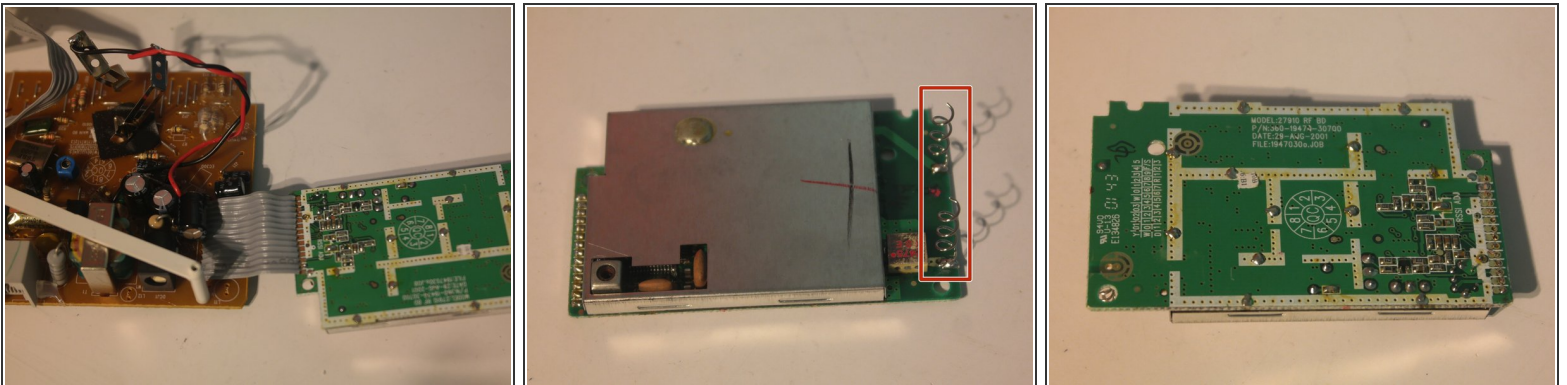
- Just like in the handset, the wireless module is connected to the main board with a soldered ribbon cable. I'm sensing a theme here.
- Remove 2 screws that hold down the main board.

## 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.

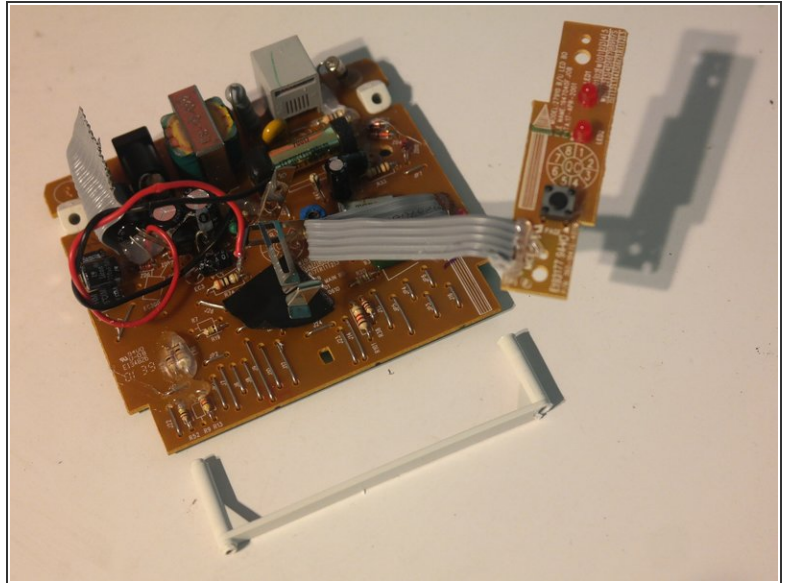
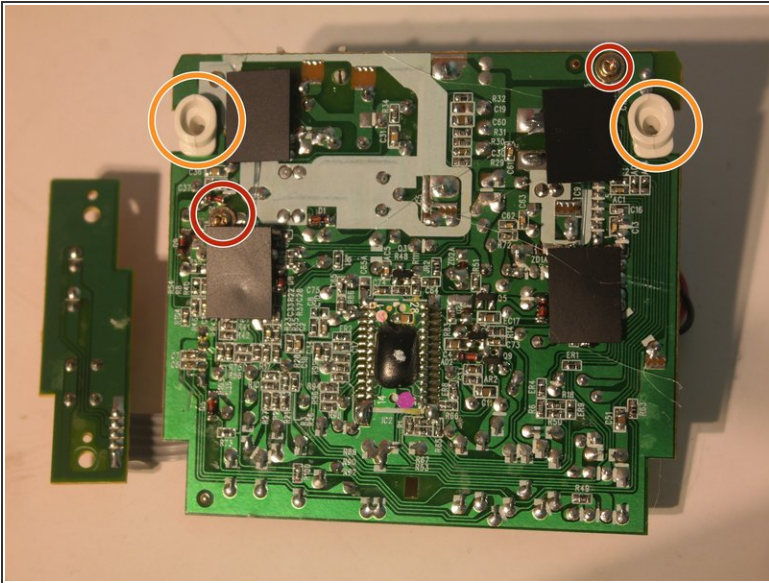
## Step 20



- 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.

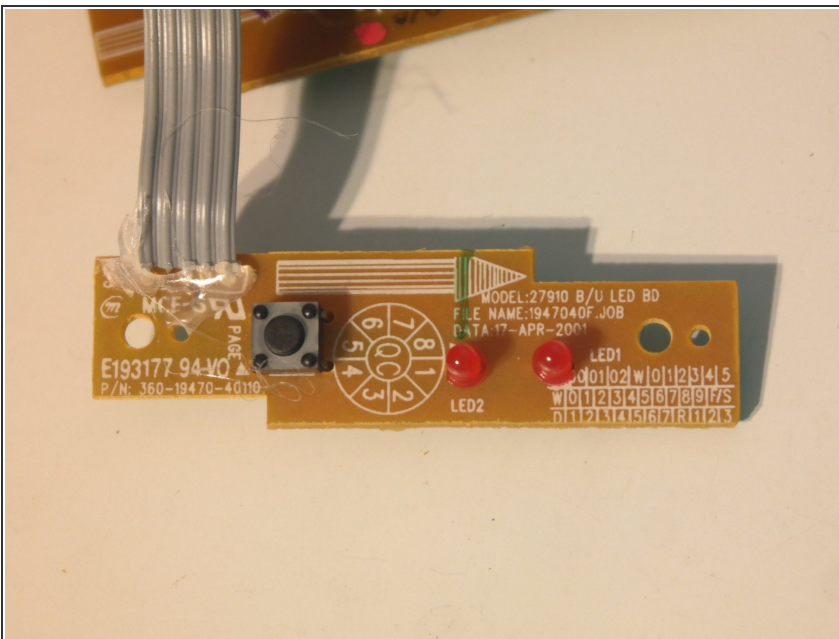


## Step 21



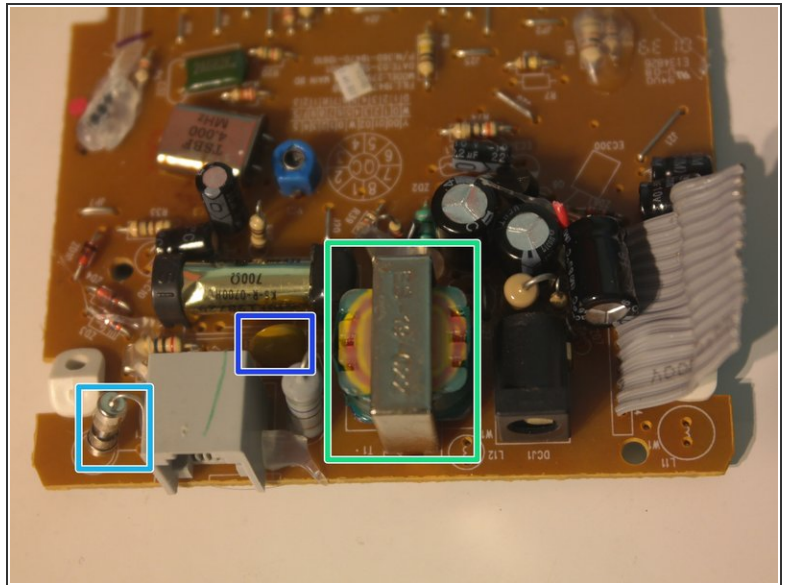
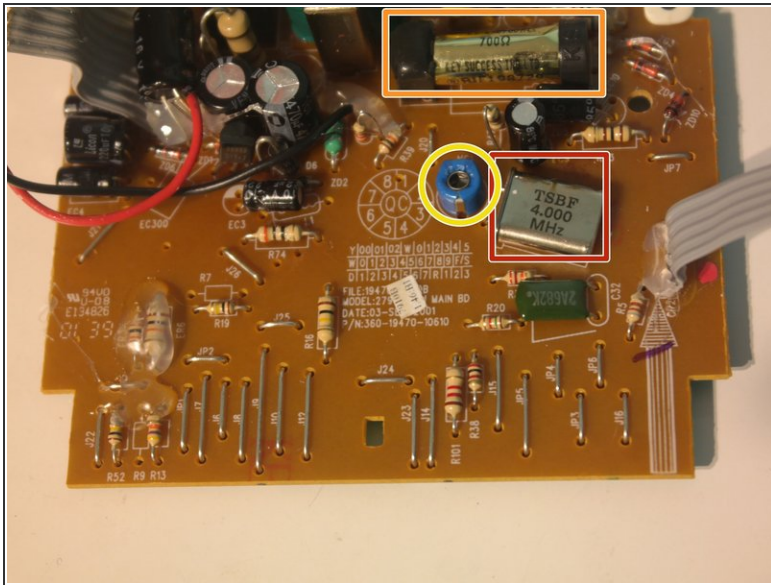
- Remove 2 screws to remove the support for the wireless module.
- The plastic pieces used to hold down the board can also be removed.

## 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.

## Step 23

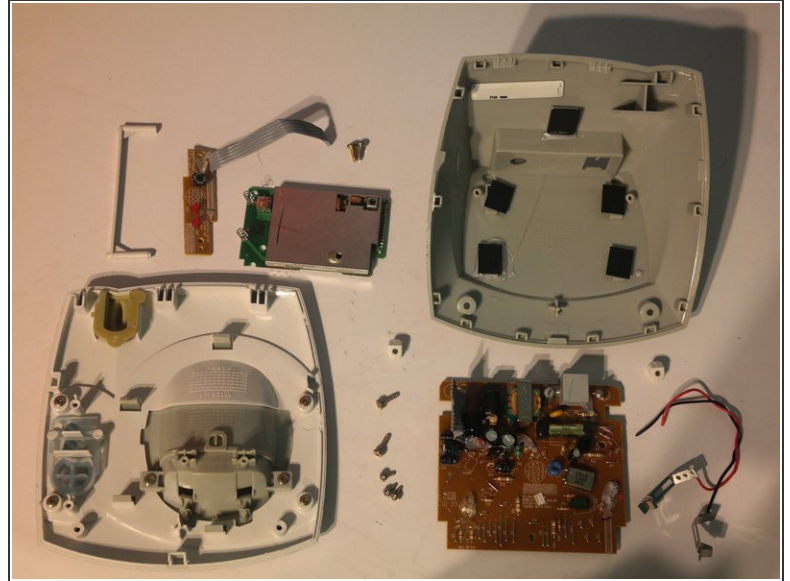


- Components on the main board:
  - 4 MHz crystal
  - [Reed relay](#)
  - Variable capacitor
  - Small audio transformer
  - Miniature fuse
  - Varistor for surge protection
- This board was manufactured on September 3, 2001.

## Step 24

## Repairability Score:

4/10



- 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.



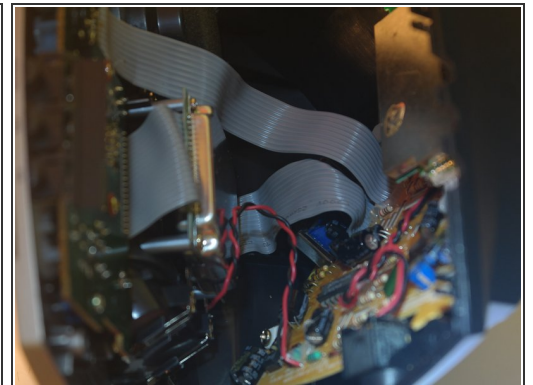
## Step 25



### ● Part III: The Main Base Station

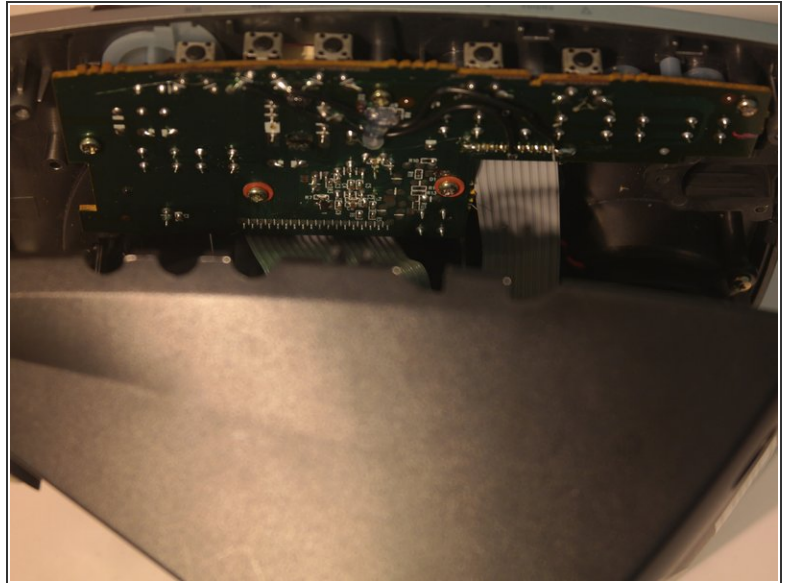
- First step: remove 4 screws.

## Step 26



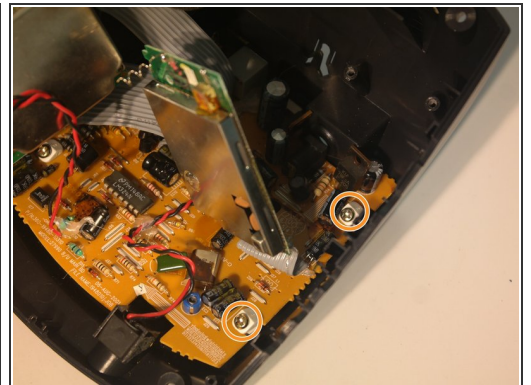
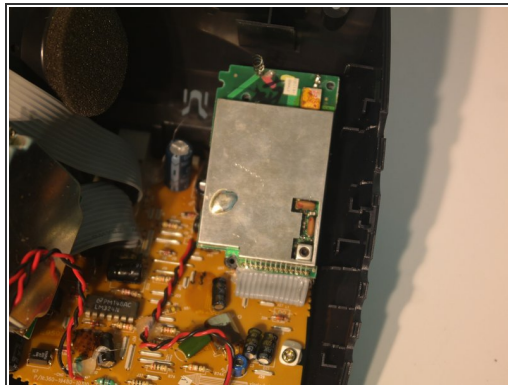
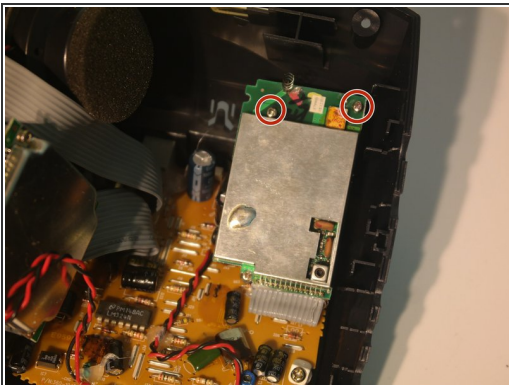
- The case for the main base station can be opened, but it requires 2 spudgers and much more force than the other one.
- Remember how I said soldered ribbon cables were becoming a theme here? I was right.

## Step 27



- Remove the buttons from the side of the case.

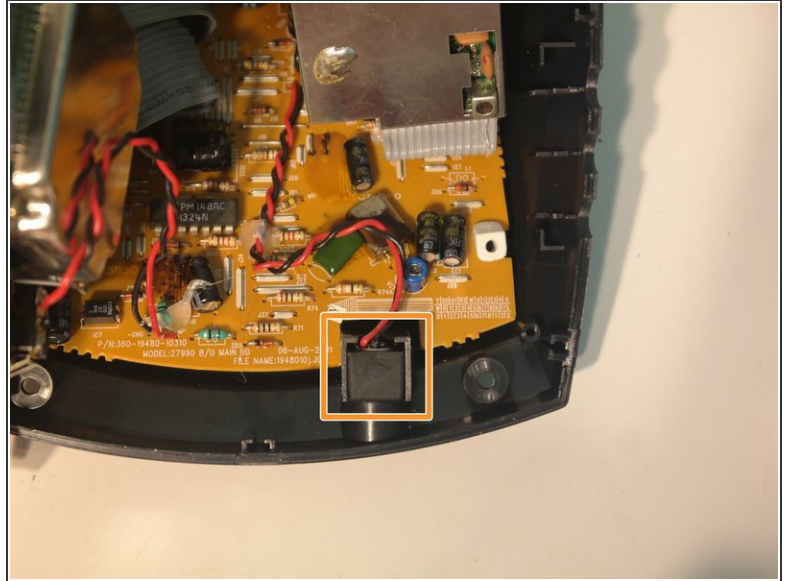
## Step 28



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

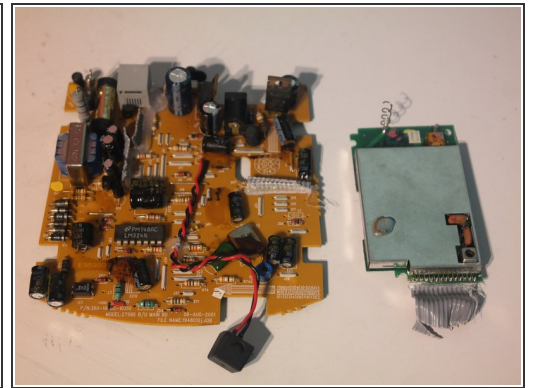
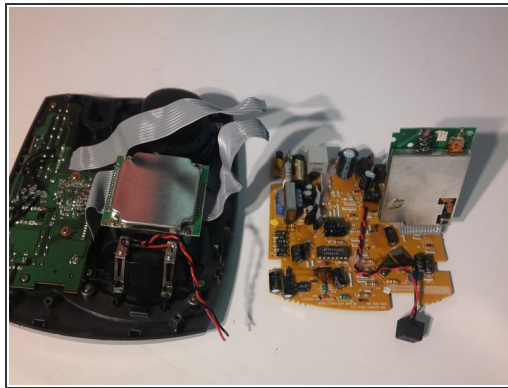
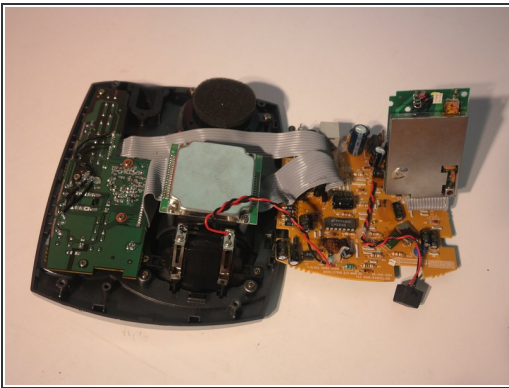


## Step 29



- Remove another 2 screws on the other side of the board.
- Remove the microphone from its holder.

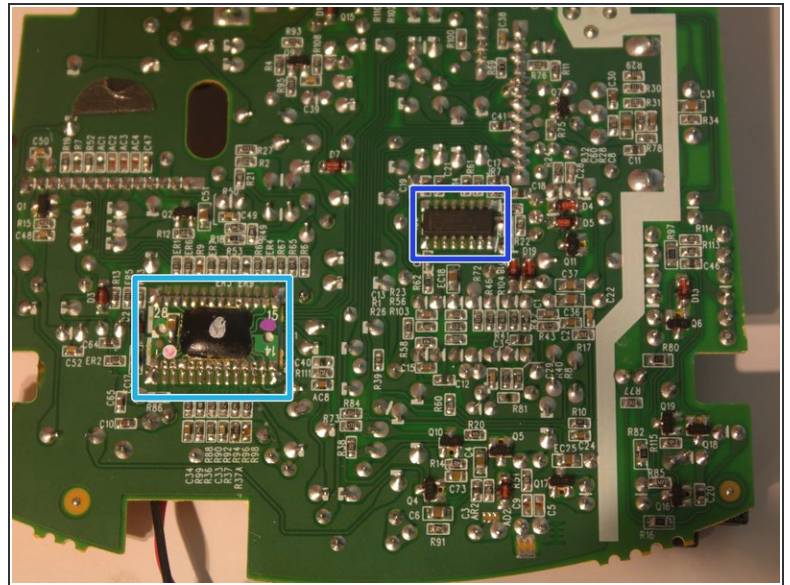
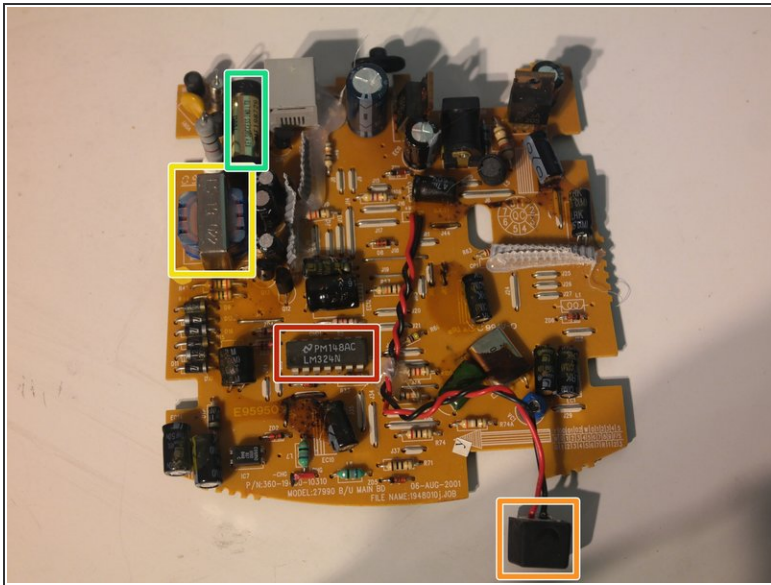
## Step 30



- 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.

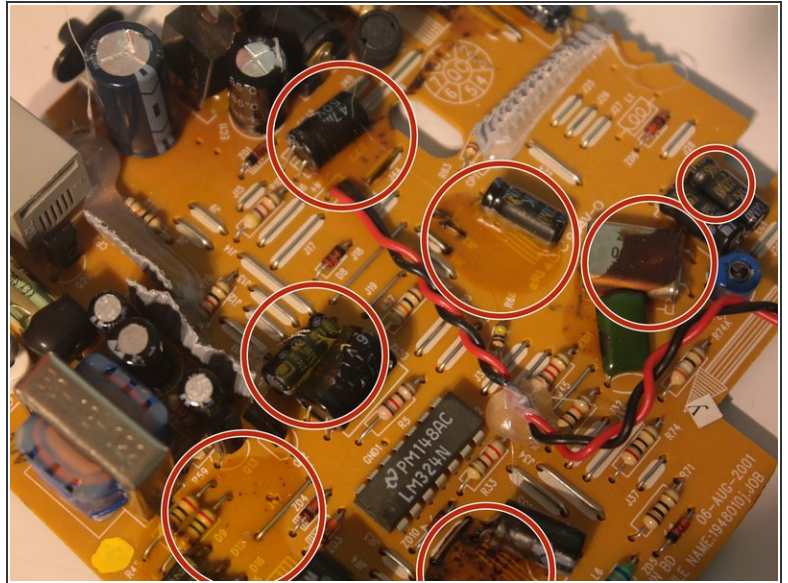
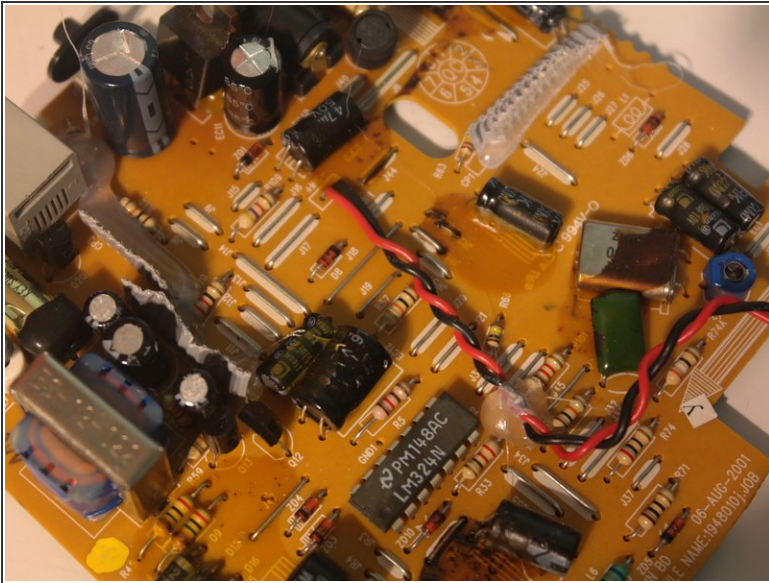


## Step 31



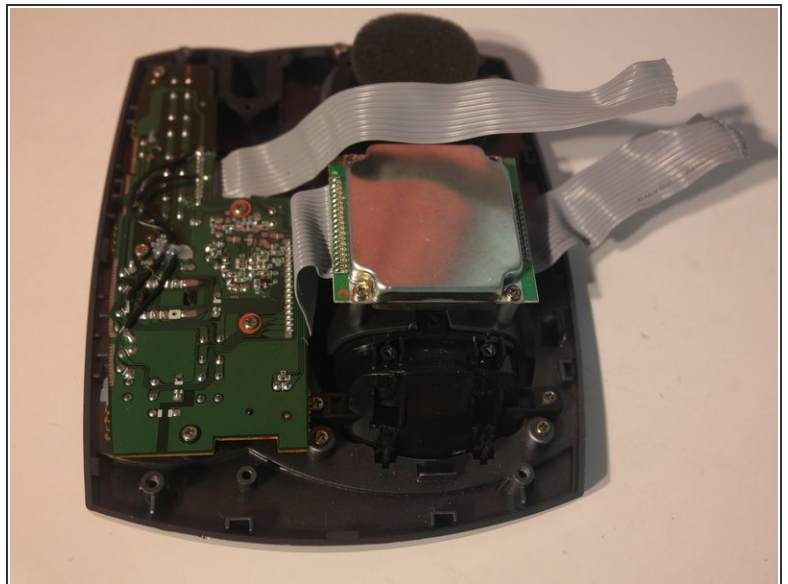
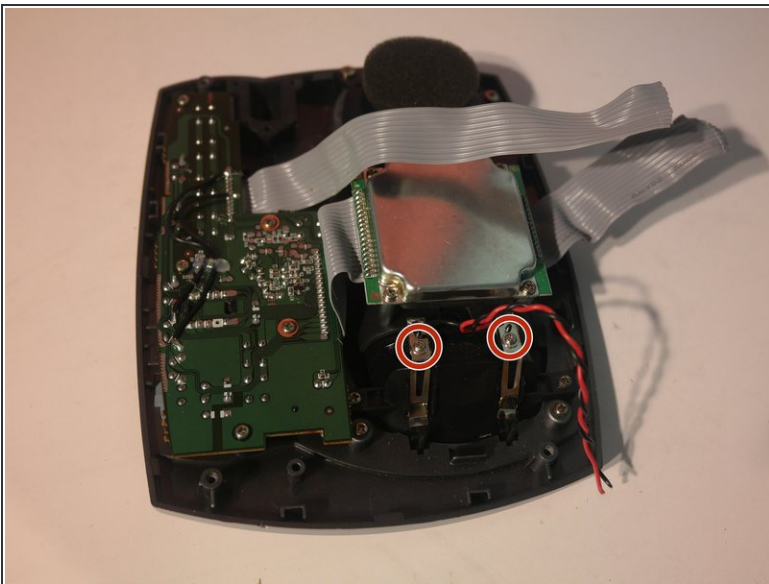
- Components on the main board:
  - [LM324](#) Quad Operational Amplifier
  - Electret microphone
  - Small audio transformer
  - Reed relay
  - Same potted 'Blob' IC found in the handset
  - [HEF4053](#) triple SPDT analog switch

## 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.

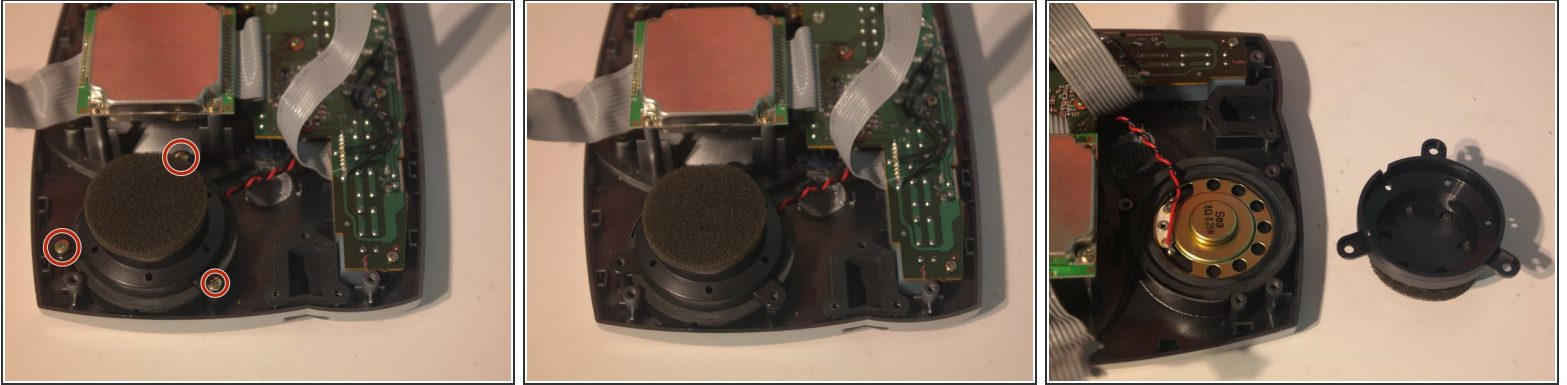
## Step 33



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

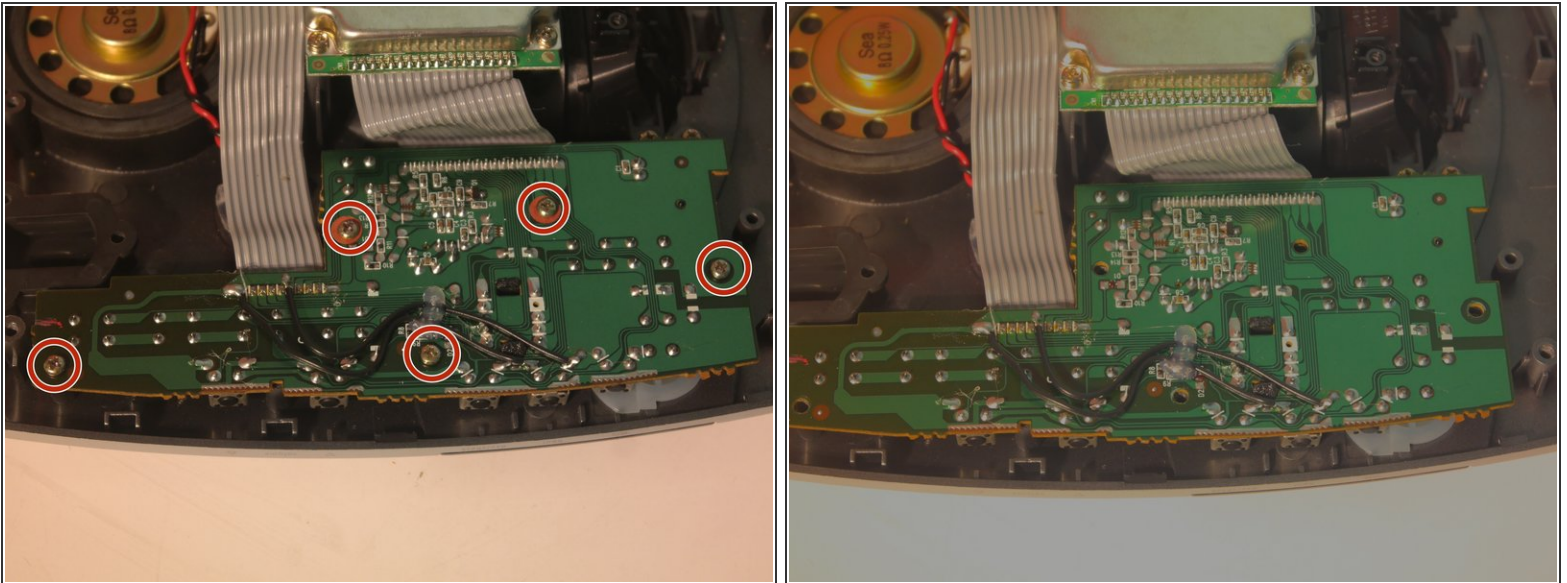


## Step 34



- 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.

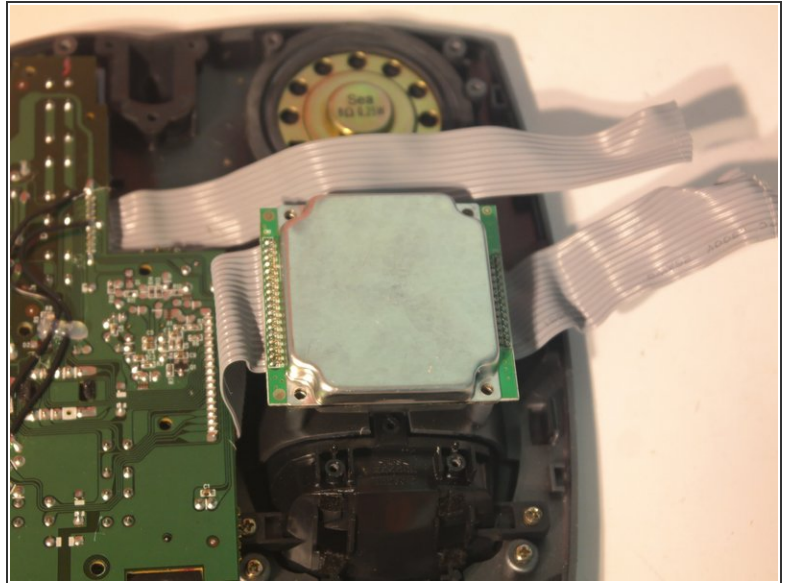
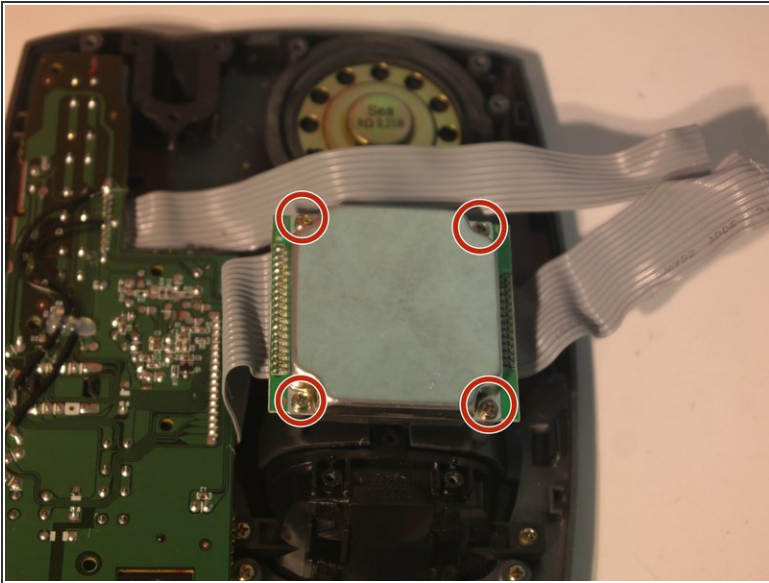
## Step 35



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

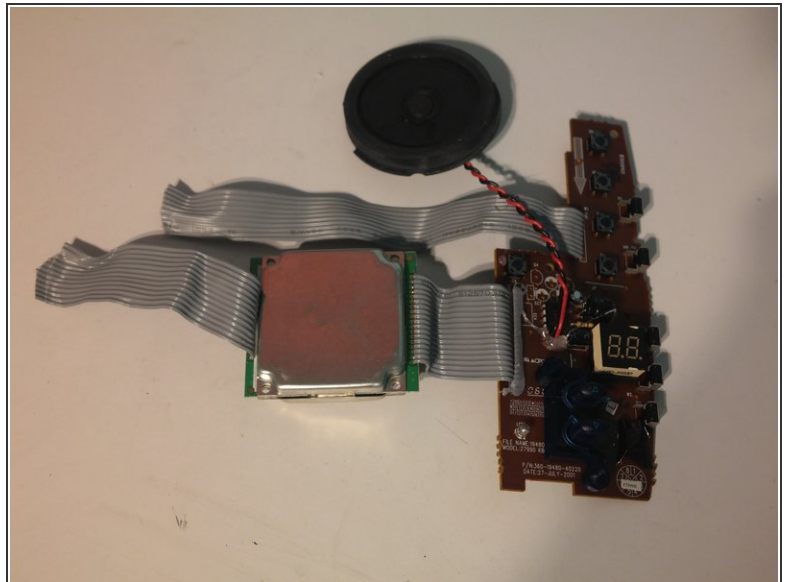
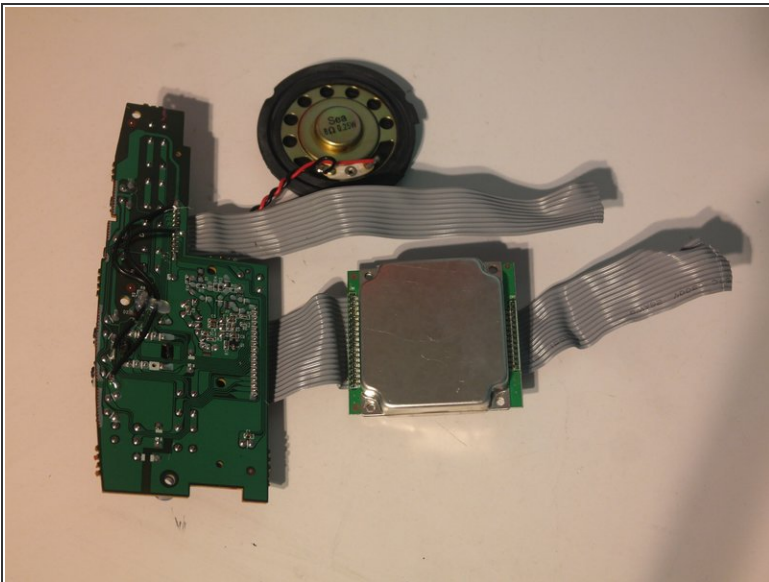


## Step 36



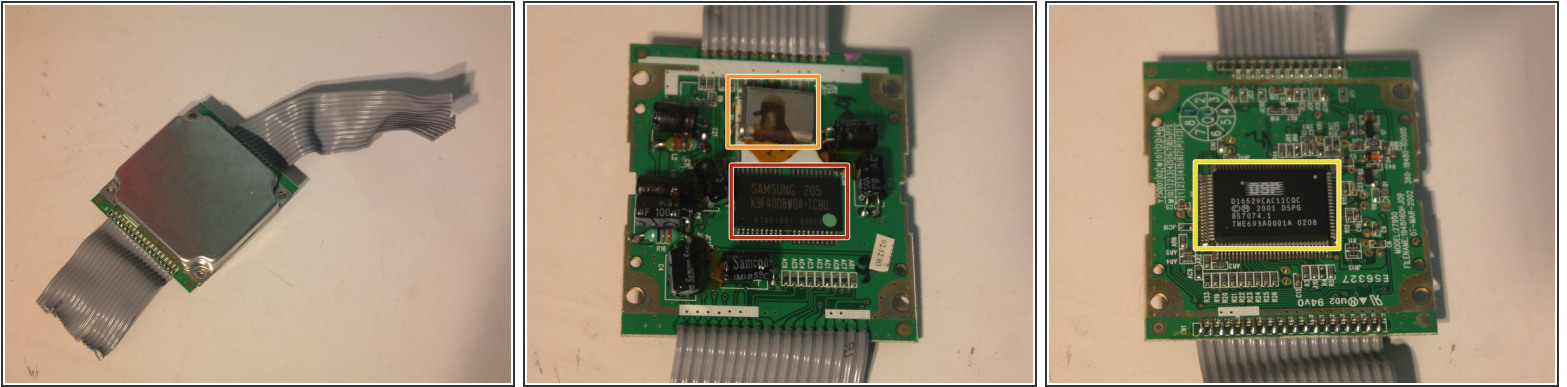
- Remove 4 screws on the mysterious metal box.

## Step 37



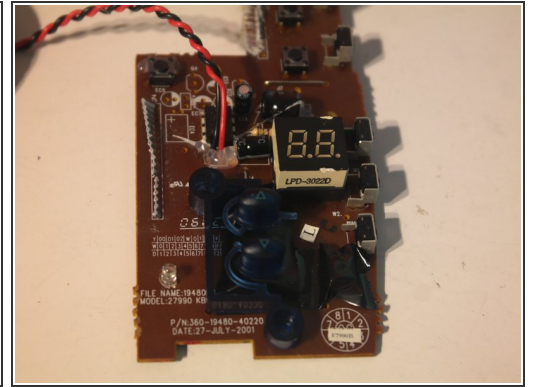
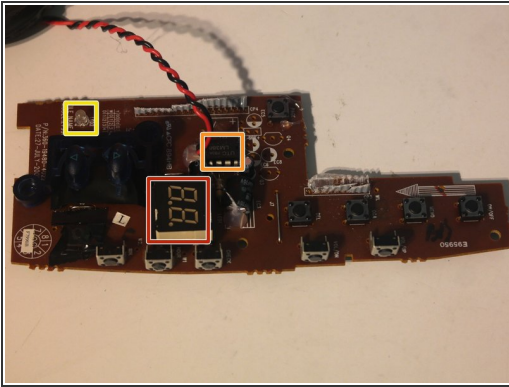
- The entire top case assembly can be removed from the printer after using a spudger to free the large buttons from clips in the top case.

## 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.

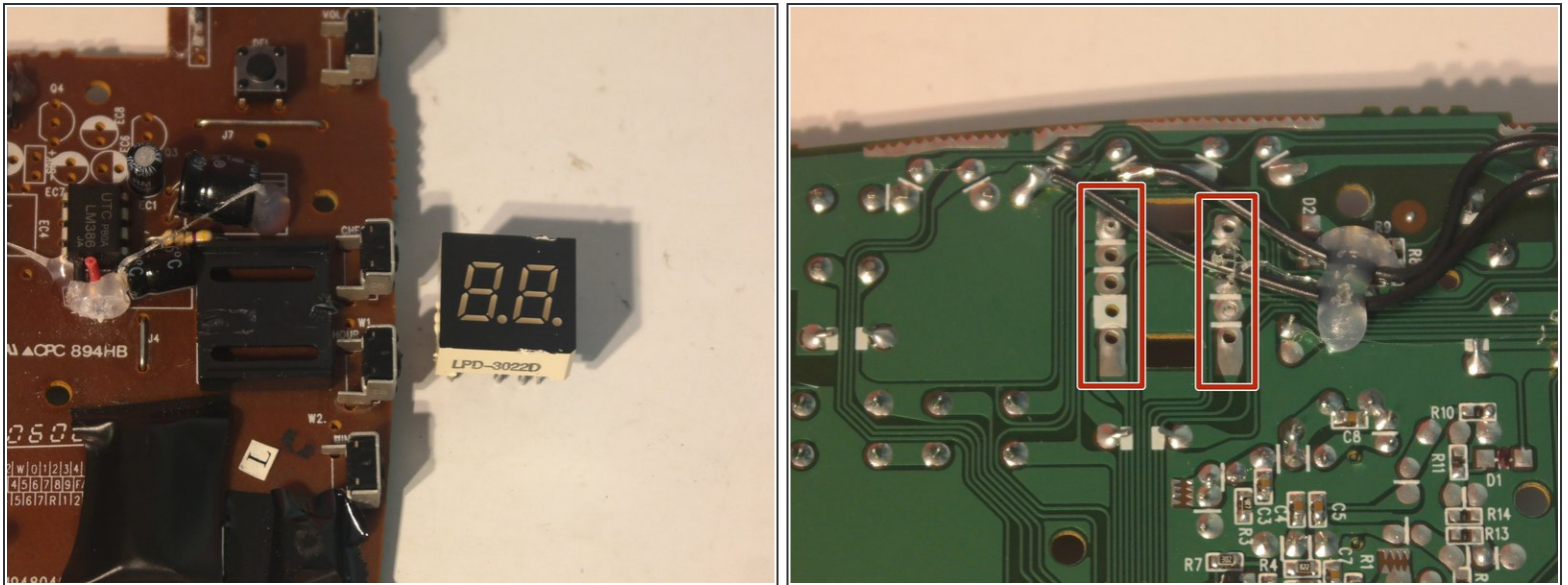
## Step 39



- 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.

**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.