Betsy Button Assembly Guide

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Introduction

This document provides step-by-step instructions for assembling your Betsy Button. The assembly involves soldering as Adafruit NeoKey BFF to the Seeeduino XIAO ESP32-C3, attaching a mechanical switch, and connecting the Wi-Fi antenna.

Parts Manifest

Before you begin, ensure you have all the necessary components:

- Seeeduino XIAO ESP32-C3 microcontroller
- Adafruit NeoKey BFF (for a single Cherry MX compatible switch)
- Cherry MX compatible mechanical switch (e.g., Cherry MX Red, Blue, Brown)
- External Wi-Fi antenna with a u.FL connector (often included with the Seeeduino XIAO ESP32-C3 or purchased separately)
- Soldering iron
- Solder (preferably lead-free electronics solder)
- Wire cutters / strippers (optional, if you want to trim the leads)
- Third-hand tool or PCB vice (recommended for soldering)

Soldering the boards

This step permanently connects the NeoKey BFF to your XIAO, allowing the microcontroller to interact with the button and its NeoPixel LED. The NeoKey BFF simplifies wiring by providing dedicated pads for the XIAO.

1. Identify the designated solder pads on both the Adafruit NeoKey BFF and the Seeeduino XIAO ESP32-C3.

   The NeoKey BFF is designed to mate with the Seeeduino's pins.

2. Align the NeoKey BFF directly onto the Seeeduino XIAO ESP32-C3.

   To ensure correct aligment, verify the following pins connect:

XIAO pin	NeoKey BFF pin
VUSB	5V
GND	GND
D0	A0

3. Connect pins using headers.

Use the headers included with the XIAO to connect the two boards. The long side of the header should be on the NeoKey BFF board.

Heat each connection point (pad or pin) with your soldering iron, and apply a small amount of solder to create a solid electrical joint. Ensure solder flows smoothly and forms a shiny, cone-like shape. Avoid creating solder bridges between adjacent pads or pins, as this will cause short circuits.

4. After soldering, carefully inspect all joints to ensure they are firm and properly connected, with no stray solder or short circuits.
5. Trim header pins from the NeoKey BFF side, if you like.

Attaching the Switch

The NeoKey BFF is designed to accommodate a Cherry MX compatible mechanical switch, using a hot-swappable, solderless socket.

1. Locate the two metal pins at the bottom of the switch.
2. Carefully align these pins with the corresponding hot-swappable sockets on the Adafruit NeoKey BFF.
3. Gently but firmly press the switch into the sockets. Ensure it is fully seated and stable.

Attaching the Wi-Fi Antenna

The Seeeduino XIAO ESP32-C3 requires an external antenna for optimal Wi-Fi performance.

1. Locate the small, gold u.FL connector on the Seeeduino XIAO ESP32-C3 board. It's very small and circular.
2. Take your external Wi-Fi antenna cable. It will have a matching u.FL connector on one end.
3. Carefully align the u.FL connector on the antenna cable directly over the connector on the Seeeduino.
4. Apply gentle, even pressure straight down on the antenna connector until you hear or feel a distinct click. This indicates it is securely connected.

   I found it helpful to use a flat tool like a screwdriver to ensure even pressure on the connector. Avoid twisting or applying excessive force, as these connectors are delicate.

Completion

Your Betsy Button assembly is now complete! You can proceed to program your microcontroller using the Betsy Button Programmer web interface as described in the separate programming instructions.