# Loop pedal

## Functionality

* input/output
  + ONBOARD-MIC
  + EXTERNAL-MIC
    - On the AUX jack
    - The op-amp goes on this
  + OUTPUT
    - On the AUX jack
  + PLAY/PAUSE Button
    - This button regulates if the devices plays the recorded music or not
  + RECORD Button
    - Starts recording and storing into EEPROM the microphone data
  + AUX/MIC Button
    - Switches between EXTERNAL-MIC and ONBOARD-MIC
  + RGB LED
    - Depends on the previous three buttons, just switch colors dependent on the state (not specified)
  + Battery indicator leds
    - Just indicate the percentage of the battery
* Algorithm
  + Device boot up
    - Initialize all peripherals
    - Read buttons and setup the AUX/MIC
    - Clear EEPROM
    - Indicate the battery voltage through the leds
  + While loop
    - If play/pause button is pressed
      * If play
        + Read the stored EEPROM music data
        + Output it to the AUX jack (explained later)
        + Change LED color
      * If pause
        + Stop outputing to the AUX jack
        + Change LED color
    - If RECORD button is pressed
      * If the previous state was “not recording”
        + Change LED color
        + Store mic data in EEPROM (mic data explained later)
      * If the previous state was “recording”
        + Change LED color
        + Stop writing data in EEPROM
    - If AUX/MIC button is pressed
      * Check which state it is
        + Change from EXT to INT (or INT to EXT) microphone
    - Main microphone loop
      * Read microphone data
        + If record is enabled, this data will be stored to EEPROM

\*\* the main objective is to always output the current microphone data (sound), but when play is pressed the stored (recorded) sound should play along with the current microphone data (sound), so said mix the recorded and the current sound.

\*\* when record and play is pressed at the same, while recording you play the old recording, and after the recording is over, you combine the new recorded with the old recorded and play that (basically mix the old recorded and the new recorded). To not have data length mismatch, the recording automatically records the length of the old recording (that way you have the same length and it is easy to combine)

## Hardware

* Najveci deo seme je baziran na discovery board
  + <https://www.st.com/content/ccc/resource/technical/document/user_manual/70/fe/4a/3f/e7/e1/4f/7d/DM00039084.pdf/files/DM00039084.pdf/jcr:content/translations/en.DM00039084.pdf>
  + Skroz dole imas full schematic
* Extra components
  + EEPROM
    - <https://www.st.com/content/ccc/resource/technical/document/datasheet/b7/de/9b/f6/03/28/4e/8e/CD00290537.pdf/files/CD00290537.pdf/jcr:content/translations/en.CD00290537.pdf>
  + Mic preamp
    - <https://eu.mouser.com/datasheet/2/256/MAX4465-MAX4469-934412.pdf>

## Software