# Hardware Plan — McCoy Speaks (Baseline V1)

**Document type:** Hardware Plan (baseline) **Project:** McCoy Speaks  
**Version:** Baseline V1  
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## Purpose

This is the baseline version of the hardware plan for *McCoy Speaks*. It defines the confirmed hardware architecture, harnesses, and bill of materials as the stable reference point moving forward.

## Section 1 — Goals

* Establish a clean baseline of the ATTiny85-based McCoy hardware design.
* Maintain accurate harness definitions (one wire per real connection).
* Provide a verified BOM for prototyping and production reference.
* All further edits will increment version numbers and note changes from this baseline.

## Section 2 — Main Components

* **MCU:** ATTiny85 (SOIC-8 preferred)
* **Battery:** EEMB 562030 LiPo 3.7 V 280 mAh (with JST/Molex connector)
* **Protection/Charge:** TP4056-style module (with integrated boost converter)
* **Pushbutton:** Momentary tactile (trigger / mode)
* **On/Off Switch:** Mini slide or toggle
* **Audio Module:** DFPlayer Mini
* **Speaker:** 8 Ω miniature full-range speaker (reuse from Hallmark Ornament)
* **LED (optional):** Status indicator (speech / mode)
* **Polyfuse:** Resettable fuse between battery and system
* **Connectors:** Battery JST, optional expansion or debug header
* **Firmware Update:** Off-board process (details in Software Plan)

## Section 3 — High-Level Architecture

Battery → Polyfuse → Charge/Protection (with boost) → Vsys → MCU (ATTiny85)  
 ↳ Button Input  
 ↳ DFPlayer Mini  
DFPlayer Mini → Speaker  
MCU → Optional LED  
Ground shared across all components

## Section 4 — Harness Templates

### Harness A — Power & Battery

| # | From | To | Signal | Color | Gauge | Notes |
| --- | --- | --- | --- | --- | --- | --- |
| A1 | Battery + | Polyfuse In | VBAT | Red | 26 AWG | Single wire only |
| A2 | Polyfuse Out | Charger In / Vsys | VSYS | Red | 26 AWG |  |
| A3 | Battery – | System GND | GND | Black | 26 AWG | Common ground |

### Harness B — MCU & Controls

| # | From | To | Signal | Color | Gauge | Notes |
| --- | --- | --- | --- | --- | --- | --- |
| B1 | SW1 Pushbutton A | ATTiny85 PB2 (pin 7) | BUTTON\_IN | Blue | 26 AWG | Use INPUT\_PULLUP |
| B2 | SW1 Pushbutton B | GND | BUTTON\_GND | Black | 26 AWG |  |
| B3 | ATTiny85 VCC | Vsys | VCC | Red | 28 AWG | Decouple locally |
| B4 | ATTiny85 GND | System GND | GND | Black | 28 AWG |  |
| B5 | SW2 On/Off Switch | Battery + (pre-polyfuse) | POWER\_EN | Red | 26 AWG | Inline power |

### Harness C — Audio Path

| # | From | To | Signal | Color | Gauge | Notes |
| --- | --- | --- | --- | --- | --- | --- |
| C1 | DFPlayer Mini OUT | Speaker + | SPK+ | White | 24 AWG | Mono output |
| C2 | DFPlayer Mini GND | Speaker – | SPK– | Black | 24 AWG | Common ground |

## Section 5 — Bill of Materials (Baseline)

| Ref | Part | Description | Qty | Notes |
| --- | --- | --- | --- | --- |
| U1 | ATTiny85 | ATTiny85-20SU | 1 | Confirm package |
| BATT | LiPo Battery | EEMB 562030 3.7 V 280 mAh | 1 | JST plug |
| CHG | Charger/Protection | TP4056 module with boost | 1 | With protection & boost |
| PF | Polyfuse | 300 mA hold | 1 | Resettable |
| SW1 | Pushbutton | Momentary tactile | 1 | Trigger / mode |
| SW2 | On/Off Switch | Mini slide or toggle | 1 | Inline power or logic enable |
| AUD | Audio Module | DFPlayer Mini | 1 | Direct to speaker |
| SPK | Speaker | 8 Ω miniature | 1 | Reused from Hallmark Ornament |
| LED | LED | 3 mm LED + 330 Ω resistor | 1 | Optional status indicator |
| C1 | Decoupling Capacitor | 0.1 µF ceramic | 1 | Near ATTiny85 VCC |
| C2 | Bulk Capacitor | 10 µF electrolytic | 1 | On Vsys line |
| R1 | Series Resistor | 330 Ω | 1 | For LED or signal protection |
| R2 | Pull-down Resistor | 10 kΩ | 1 | Optional for control line |

## Section 6 — Verification Rules

* One wire per connection; polyfuse has one input and one output.
* All grounds must share a common reference (star or bus).
* Label all connector pins and IC pins.
* Decoupling capacitors near ATTiny85 VCC and charger outputs.
* Future updates must increment version and document changes separately.

*End of Baseline V1*