# CC3501 Progress Report

**Group number:** 1  
**Team members:** Tayla Bender, Benjamin Bowden, Jesse Mocilac, Rothon Browne  
**Week number:** Week 5 (22/06/2025)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Task** | **Who did it?** | **What were the outcomes?** | **Who did the peer review?** | **What did you learn?** |
| Brainstorming | Ben | A smart baby monitor that integrates multiple sensors and communication technologies | Tayla, Jesse | The types of sensors we would like to include in our project: Temperature, Microphone, Accelerometer, motion, humidity, and camera. |
| Begin project on Altium | Ben | Created schematic and PCB design on Altium. | Tayla, Jesse, Rothon | Project planning and team coordination skills. |
| Find compatible components for sensors | Tayla, Jesse | Identified suitable parts and verified specifications through datasheet review. There are multiple sensors that can be used on the Raspberry Pi Model 4, therefore we only need to add a motion sensor and humidity sensor. | Ben, Rothon | Component selection criteria and specifications. |
| Design humidity sensor circuit | Jesse | Researched and reviewed available humidity sensors, drew schematic in Altium and added to PCB. | Ben | The schematic matches the datasheet. Identified redundant pull up resistors on SDA and SCL on I2C network. |
| Identify Bluetooth breakout board. | Rothon, Jesse, Tayla | Determine the mounting standard of the breakout board and the required connections, communication protocol, etc… | Ben | Double check specifications during integration. |
| Integrate Bluetooth board into schematic. | Ben | Work with Rothon, Jesse and Tayla to design the schematic on Altium. | Jesse, Tayla, Rothon | The schematic matches the datasheet. No issues identified. |
| Add Bluetooth board to PCB. | Ben | Wire up Bluetooth pads on the back of the board and ensure signal integrity. | Jesse | Fix design by mirroring pins to the back side of the board. |
| Design motion sensor circuit | Tayla | Researched and reviewed available motion sensors, added schematic into Altium. Was unsure of the circuit connection as the datasheet wasn’t too clear. | Ben | Fix design based on class/lecturer review. Added recommended MOSfet from the datasheet to the motion sensor circuit. |
| Microphone | Ben | Add microphone to the schematic | Tayla | The microphone part was out of stock. The correct part was added instead. |
| Add motion sensor to PCB | Ben | Downloaded and added the motion sensor footprint into Altium. Added sensor to PCB. | Jesse, Tayla | Learned to correctly import third-party components to Altium’s library so that it will show on PCB layout. |
| Research battery options | Tayla, Jesse | Researched different types of batteries and compared options. The choices are between lithium polymer or lithium ion. | Tayla, Jesse | We decided that lithium polymer ion would be the best option for recharging and for the design as it is flat and doesn’t need to be mounted. |
| Implement a battery circuit | Tayla | Found a battery management part (TP4056) to ensure safe charging. Created a battery circuit. | Ben | Changed the PROG resistor (10K) to two resistors in parallel with ground. This is to ensure control over the current charging the battery.  - 100mA |
| Identify status LEDs and design accompanying circuitry. | Tayla, Jesse | Consult datasheet and voltage curve for LEDs to ensure operation at safe power levels. Consult datasheet for battery charging chip in order to ensure correct status LED function. | Ben | Identify alternative LEDs in the JLCPCB basic parts list and integrate into schematic. Ensure new LEDs operate at safe power levels as per datasheet and voltage curve. |
| Merge battery circuit with the USB input and voltage regulator circuit. | Jesse | Found a compatible JST for the battery. Integrate battery charging circuit with the rest of the circuit. | Ben | Added a diode and MOSfet to the battery circuit for the power control system. |
| Add the battery circuit to the PCB design. | Ben | The battery circuit implementation was delayed because the required component footprints were only available on another team member's computer. | Tayla, Jesse | An Altium library was created to ensure all members can access the same component footprints and symbols, preventing future workflow disruptions. |

**Overall project tracking:**

|  |  |
| --- | --- |
| **Week number** | **Milestones** |
| 3 | Confirm project topic and pick group members. |
| 4 | Prepare preliminary design on Altium. Submit draft design by Friday night to ensure the design can be reviewed by class in week 5. |
| 5 | Review and finalise prototype design to submit for manufacturing. Submit a progress report. |
| LR1 | Begin software. Create modular code files for the Bluetooth stack, temperature sensor, accelerometer, audio processing algorithms, and core firmware architecture |
| LR2 | Continue software development. |
| 6 | Receive prototype hardware. Begin hardware-software integration and initial testing. |
| 7 | Hardware debugging, and basic functionality verification. Submit a progress report. |
| 8 | Audio, temperature, camera system testing, and Bluetooth connectivity validation |
| 9 | System integration testing and 3D casing design (printing if we have time). Submit a progress report. |
| 10 | Demonstrate prototype during final lab session. Submit a final report. |

Appendix