Embedded Bluetooth Communication System

Team: REDSOLOCUP
CIS 641 - 02

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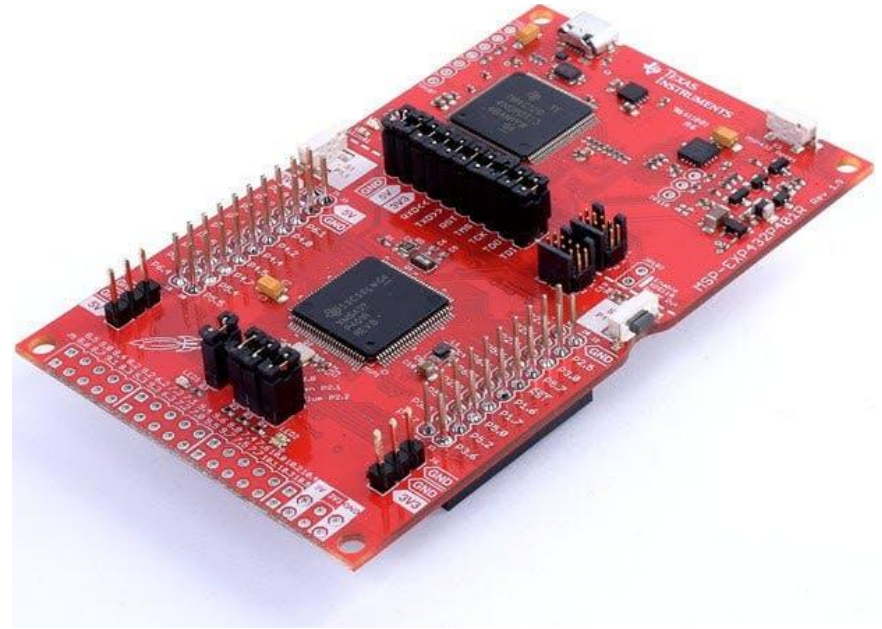❏ Embedded System Design / Maintenance

Project Overview

- CORE ~~ User able to enter message using a serial terminal (e.g. TeraTerm) and send to another user using the same system

- User #1 enters message in serial terminal → message sent serially to microcontroller → message sent via bluetooth and received by system #2 → message sent serially to secondary terminal → message viewable on serial terminal to User #2

- Three main parts to system:
  a. Bluetooth transmission
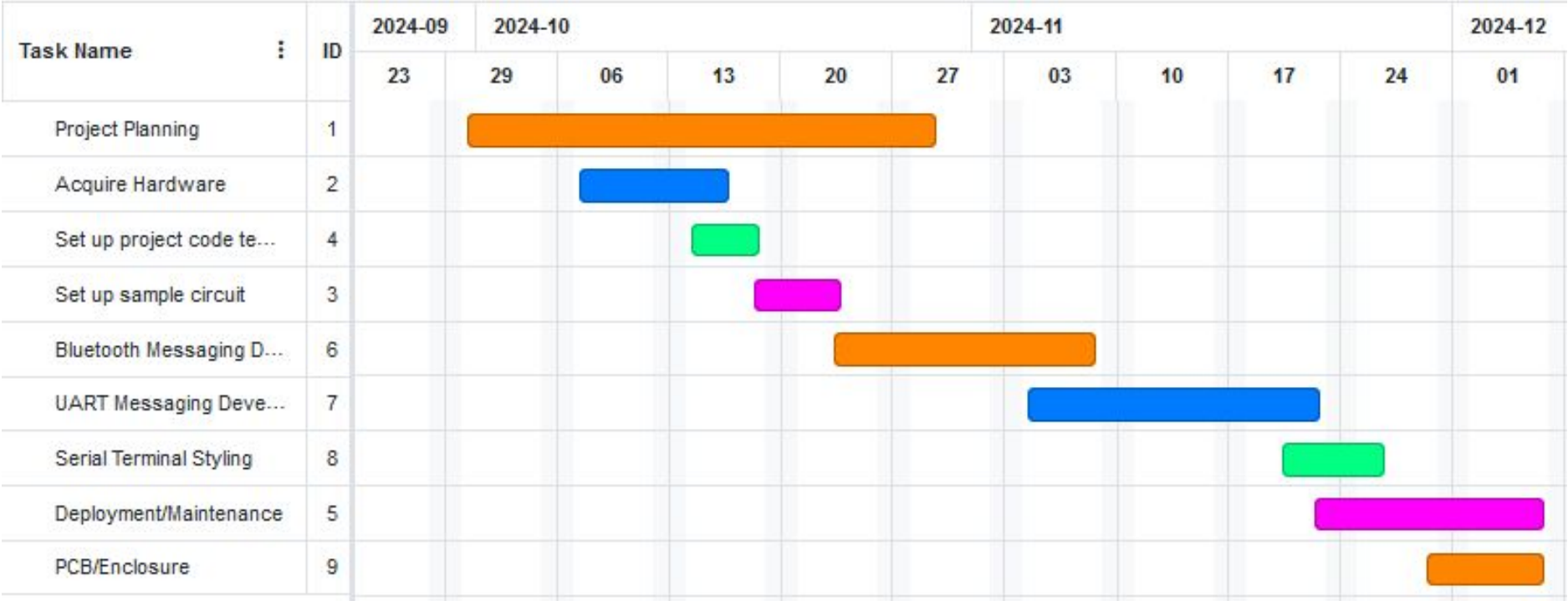 b. Serial transmission
  c. Message handling

Hardware/ Software

- MSP432 Microcontroller
- Arduino Uno
- HC05 Bluetooth Module

- Embedded C using Code Composer Studio
- Arduino IDE
- MSP432WARE middleware

Project Time Goals

[Gantt Chart from Midterm]

Task Name	ID	2024-09	2024-10	2024-11	2024-12
Project Planning	1				
Acquire Hardware	2				
Set up project code te...	4				
Set up sample circuit	3				
Bluetooth Messaging D...	6				
UART Messaging Deve...	7				
Serial Terminal Styling	8				
Deployment/Maintenance	5				
PCB/Enclosure	9				

How did I do?

- Timeline was followed relatively closely, except for a few things

- Biggest change was I worked on communicating with the serial terminal before I worked on bluetooth

- Felt like I still managed to stay at a consistent pace, however, I should have accounted for more time getting bluetooth and serial terminal working together

Conclusion

Changes from Midterm

- Did not end up having enough time to create a PCB or enclosure for the system
  - Not necessary due to the circuit being simpler than expected, direct connection between bluetooth module and microcontroller where little noise can be introduced
- Less of a focus on ANSI styling with escape codes
  - Mainly due to time constraint, would have liked to use more styling for placement of messages (future improvement?)

Future Improvements

- Figure out how to directly add pairing to main program -> don't have to use Arduino for setup
- Still would be nice to have a small enclosure and PCB to make system more compact and user friendly
- Further styling with ANSI and escape codes to make program look nicer
- Implementation of OS for better message handling

Demo.