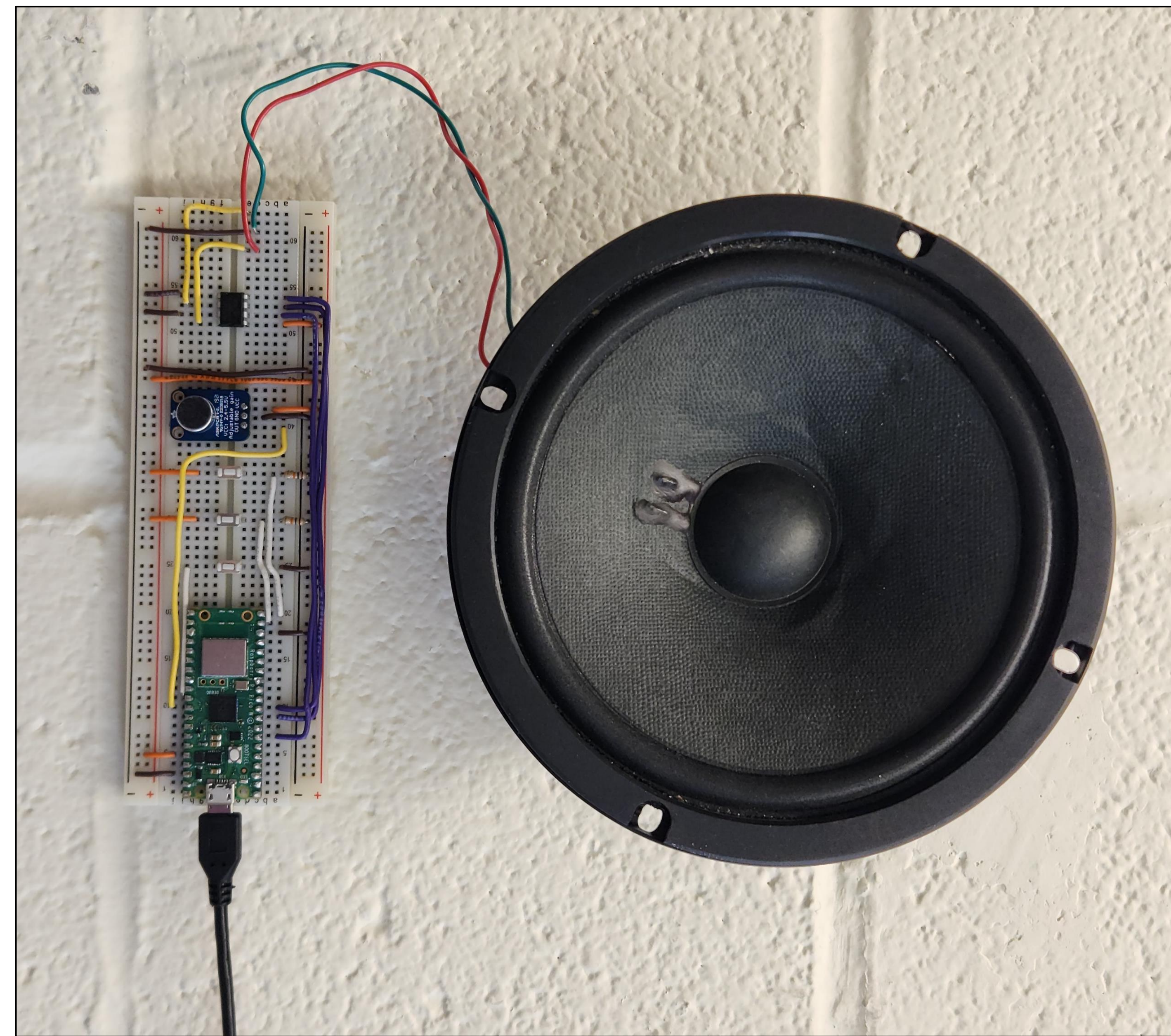# Wi-Fi Walkie Talkies
Threading and Networking Developments for the Raspberry Pi Pico W

Authors: Liam Kain, Harris Miller   **Advisors**: Hunter Adams, Bruce Land

Why Build A Walkie Talkie?

- ECE 4760 is strictly bare-metal, uses a simple threading library
- Protothreads is clunky, lacks the niceties of a real-time OS
- Wireless networking is vital to modern embedded systems and IoT devices
- ECE's embedded systems offerings do not cover networking concepts

System Concept

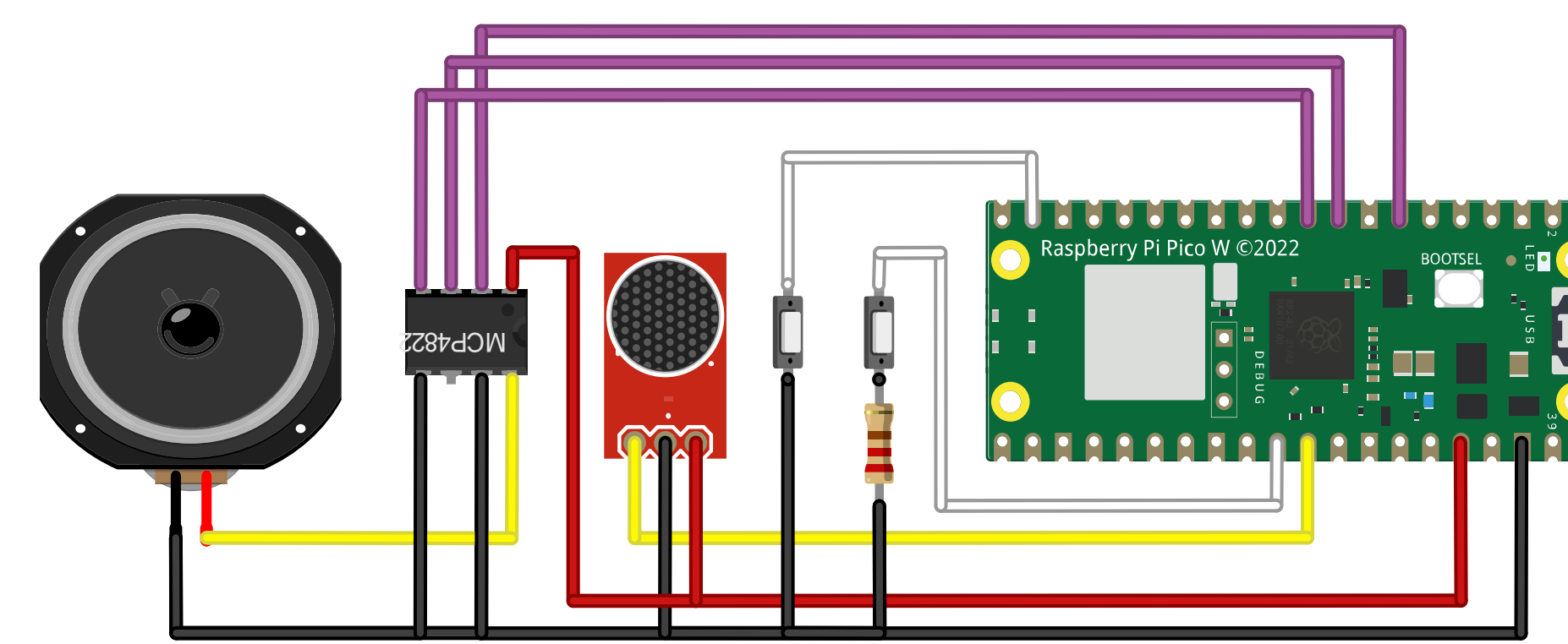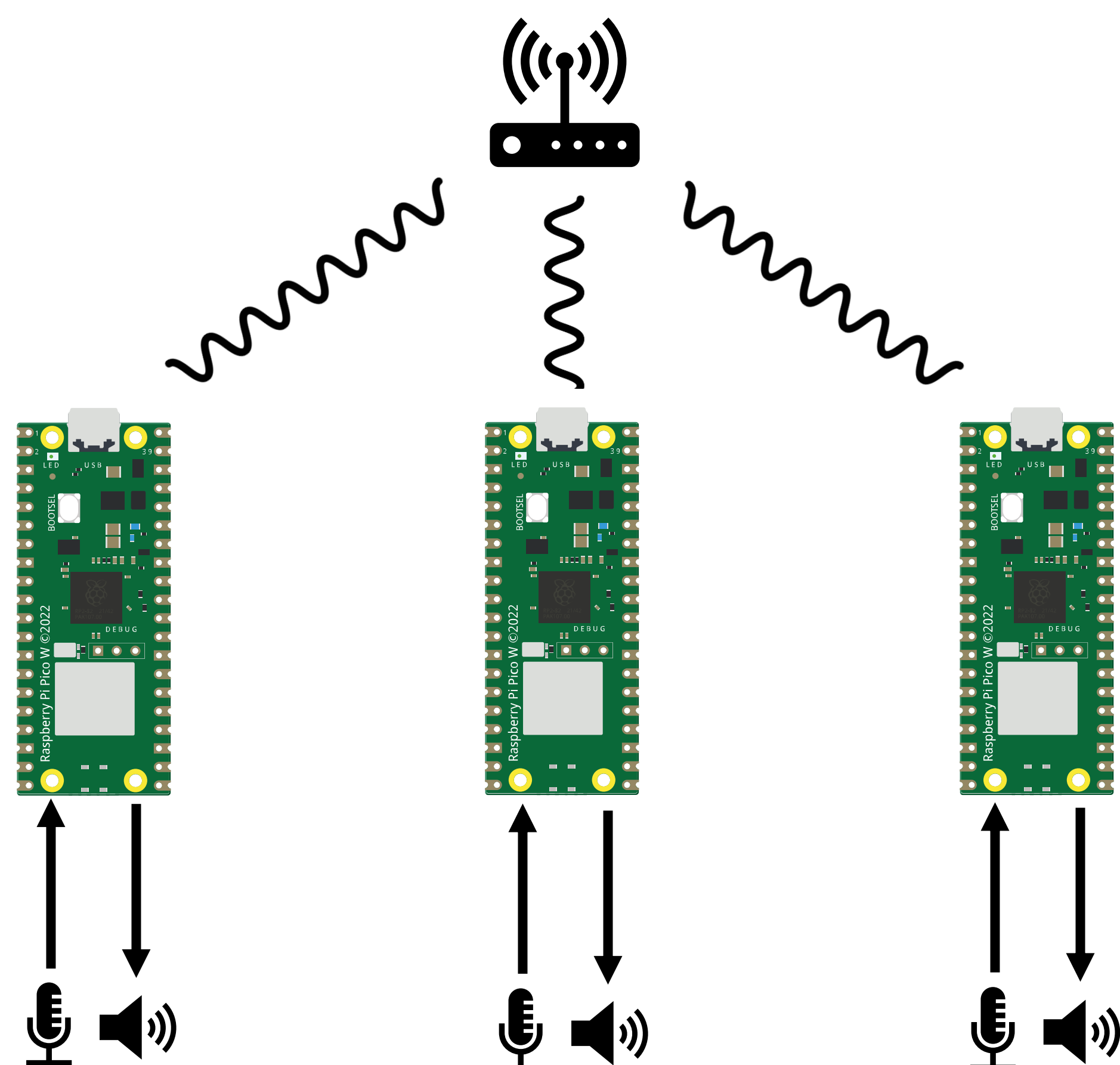Real-time OS with wireless on $6 MCU

Networking & Data Flow

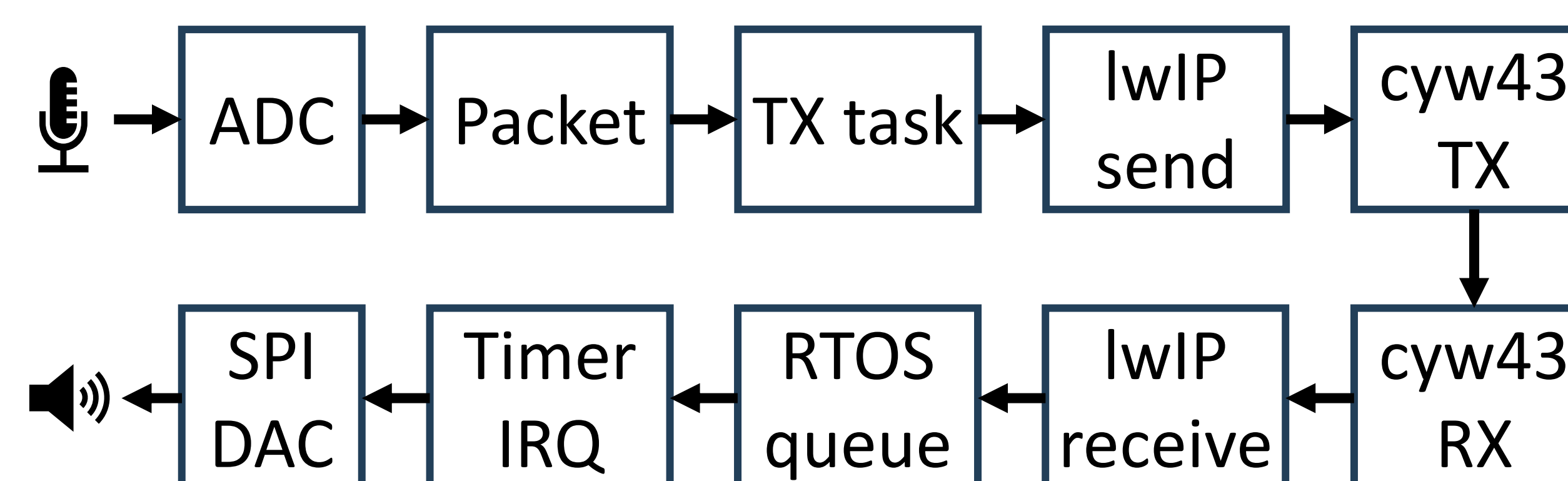## Infrastructure for Future Students

- Created libraries and documentation for ease of replication
- Provided a base repository and CMake configuration to accelerate lab start up time
- Ported the "Synthesizing birdsong" lab exercise from Protothreads to FreeRTOS

Future Work

- Reduce network congestion by converting UDP broadcast to multicast with IGMP groups
- Write up "walkie talkies" as a ECE 4760 lab exercise
- Investigating Bluetooth support

Acknowledgements

We would like to thank Hunter Adams and Bruce Land for their guidance and support throughout our project.

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