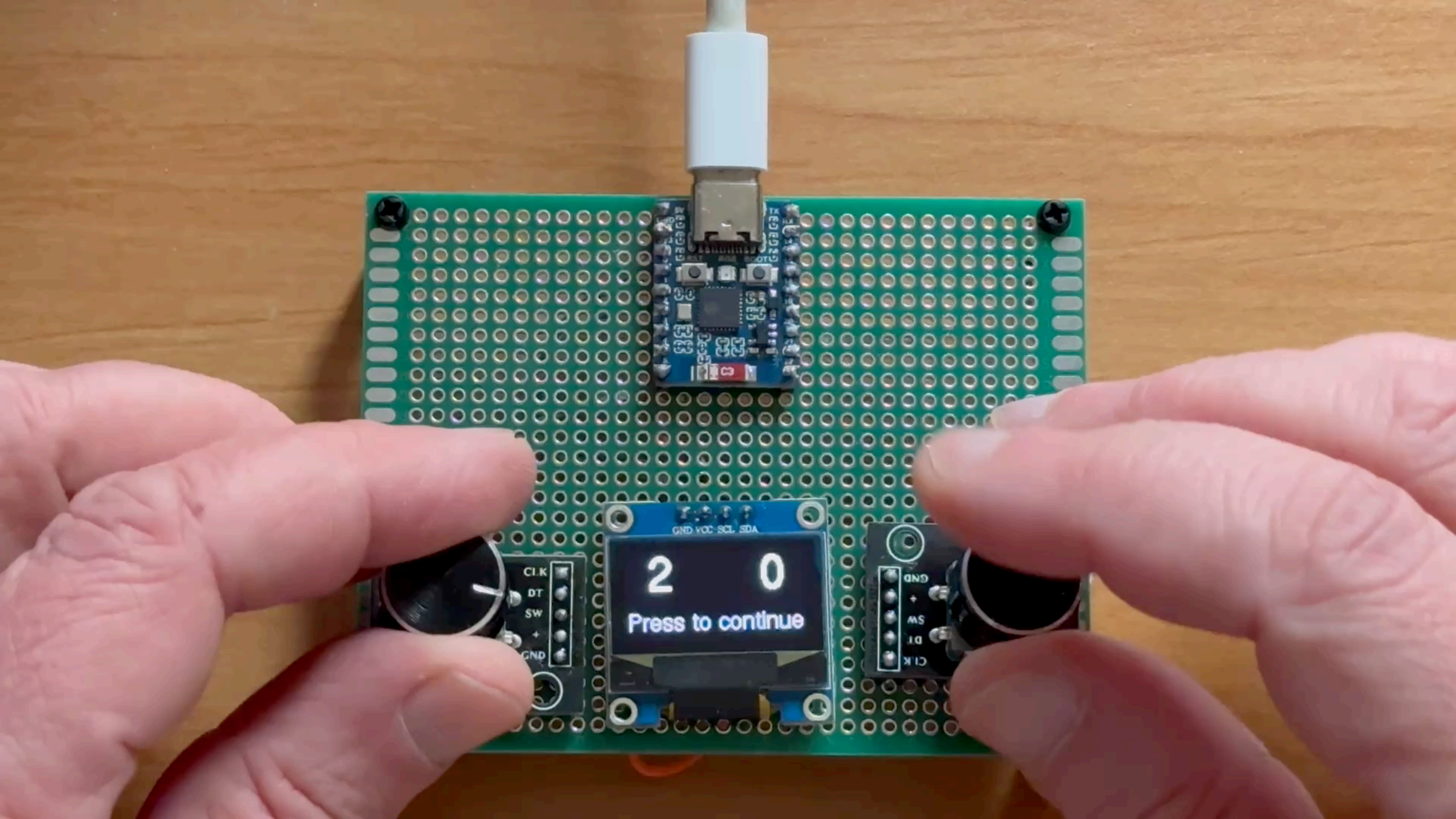


Embedded Swift Introduction

iOS Dev Happy Hour — May 31, 2025

Frank Lefebvre



Introduction

- Subset of the Swift language
 - Small runtime
 - Dynamic heap allocations can be disabled
- Work in progress

Supported Architectures

- RISC-V (ESP32)
- STM32
- ARM32 (nRF52840, Raspberry Pi Pico)
- ARM64 (Raspberry Pi 4b/5)
- PowerPC (Freescale)

Tools & Resources

- Swift Toolchain: development snapshot
- From chip manufacturer
 - definition files
 - toolbox
 - build system
 - upload

Tools & Resources

ESP32C6

- Swift Toolchain: development snapshot
- From chip manufacturer (Espressif)
 - definition files: C functions
 - toolbox: FreeRTOS
 - build system: CMake, Ninja, Python
 - upload: JTAG over USB, Python

Limitations

- By design
- Optional
- Temporary
- Undecided

Introspection and existential types

Limitation by design

- Introspection
 - Mirror
 - String interpolations
- Existential types
 - any
 - Typed throws

Concurrency

Work in progress

- `async/await`
- Actors
- Requires support from chip manufacturers

Advanced String support

Optional

- Limitations
 - count, split, etc
 - Dictionary keys
- Workarounds
 - Link libUnicodeDataTables.a
 - Unicode scalar views (`myString.utf8.count`)

The Future

- Swift Package traits
- Concurrency
- `swiftly`

Resources

"Go small with Embedded Swift" (WWDC 2024)

<https://github.com/swiftlang/swift-evolution/blob/main/visions/embedded-swift.md>

<https://github.com/swiftlang/swift/blob/main/docs/EmbeddedSwift/UserManual.md>

<https://github.com/apple/swift-embedded-examples>