

Project Terminus

A project 8-bit computer based on the Alphasmart and Freewrite

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Design Ideas

Goal

The goal is to create a portable, 8-bit computer from base components, that is at least as functional as an Alphasmart or Freewrite device, and preferably, has functionality more similar to a Tandy WP-2. Would also be good if the device can improve on some of the design problems of those devices, such as having a positionable screen.

Architecture

Currently, the best looking architecture to build the computer around looks like the [RC2014](#).

This will mean that the computer is a Z80 based system.

Operating System

Still looking into operating systems. Potential options include CP/M and CollapseOS, but definitely would prefer other options if they exist.

Serial Terminal

Originally was looking into epaper for a display, but am leaning against it due to issues with slow refresh rates. Instead, looking for LCDs that can be driven by an Arduino that might be able to serve as a full TTL terminal. If that fails, can also use a [diy-VT100](#) for the display, and a [USB Host](#) or [E1115 converter](#) for keyboard input.

Case Inspiration

The final product will likely use a 3d printed case, potentially using a modified version of the [HALGRID P-1 Raspberry Pi Laptop Computer Shell](#) (itself, based on the [GRID Compass](#)).

Components

Microcontroller

Preferred microcontroller would be a Raspberry Pi Pico, since it has a large amount of SRAM, and built in hardware for UART and SPI.

Input

Likely use an E1115F module from Adafruit as a PS/2 to TTL decoder for keyboard input. Will require a level shifter to convert to 3.3v logic for the Pico. Will also require a 5v supply in order to power the keyboard, but has a 3.3v regulator to provide power to some other component. Reserving half of UART0 for the Pico for the keyboard.

Display

Still trying to decide if wanting to use an eInk or LCD display. Can likely run the eInk easily off of a set of AA batteries, but might also be able to use the LCD with AA batteries. Would prefer at least a 5" screen of some kind, wider the better.

Addons

Wifi

An ESP8266/ESP01 module could be used to add wifi, and be interfaced with the Pico using UART1.