

# Device Bridge

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## Summary

The original intention of this device is to bridge the old world line printer port world of the Tektronics TDS2024 with the more modern world of USB. This project is loosely based on the work from [Boriz](#) but is a total rewrite of my own design.

## Table of Contents

- [Line Printer Terminal](#)
- [Pinouts](#)

## Design Goals

- When the print button on the TDS2024 the screen capture/print out should be stored on the bridge
- Captures should be stored locally on the bridge device
- Capture to SD card or local EEPROM
- Allow user to select between SD, EEPROM, and direct transfer
- If SD is not found then only record to EEPROM
- When not printing or after a configured time period show the current time/date on the LCD display
- Reading file transfer header try to detect type and make best guess on proper extension
- Allow user to overwrite the file type
- Allow user to select from name formats from LCD module or Serial over USB
- Allow computer user to list files over serial connection
  - should list SD (if provided) and EEPROM
  - allow transfer of selected files
  - update configuration options
- SD card should support FAT, FAT32 and ExFat.
  - if programming memory allows enable FAT12 as well
- use RTC to maintain current date/time.
  - configurable over serial
  - consider the ability to set from the UI
- consider using one of the secondary serial lines as an RS-232 bridge for SCPI commands

## Suggested Improvements

- Enable RTC (DS1307) on the DataLogger shield. When in Idle present the time on the screen
  - <https://github.com/cvmanjoo/RTC>
- Add support for storing files on a W25Q128 (CS pin 3)
  - When SD Card is removed or used selected the files may be stored on the eeprom
  - look at using the NASA EEFS.
  - <https://forum.arduino.cc/t/nasa-eeefs/329543/3>
  - <https://github.com/slvajero/EepromFS>
  - [https://github.com/feilipu/avr\\_eeefs](https://github.com/feilipu/avr_eeefs)
  - <https://www.instructables.com/Introduction-to-LittleFs-Write-LittleFs-Read-Little/>
  - [https://github.com/arduino-libraries/Arduino\\_MKRMEM](https://github.com/arduino-libraries/Arduino_MKRMEM)
- The current read/write process is rather slow
  - look at upgrading to SDFat as well as using a ringbuffer for reading from the parallel port
- consider adding the ability to directly output the content to the serial connection
- use the inputs on the LCD shield to support ejecting/refreshing the SD card
- consider adding prefix profiles that may be added/modified from the serial connection and selected from the interface
- consider the ability to time stamp files
- add the ability to browse/download/delete content from the serial connection
- add proper support for the control lines in relation to SPP IEEE-1284

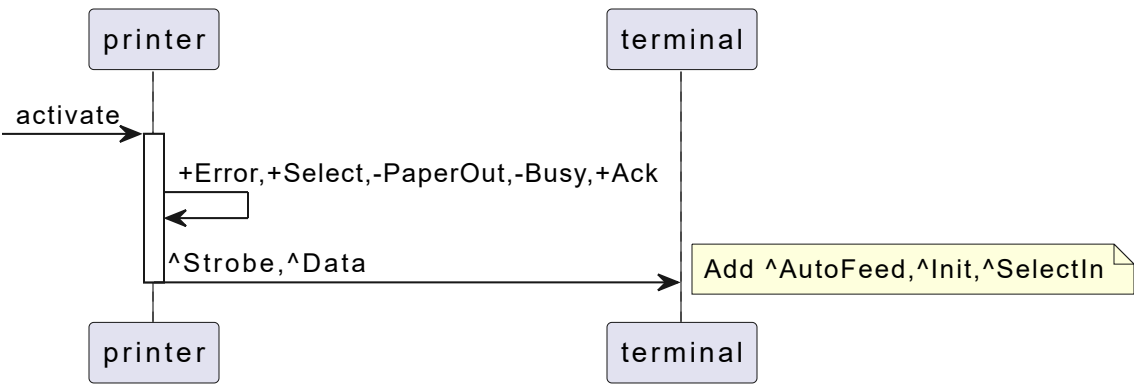
- add folder management/selection from USB
  - if tied to quick profiles allow selectig from the LCD panel
- look at using the first few bytes to detect the proper file type so they can ne named correctly
  - otherwise allow changing the file type from the LCD panel
- add proper erroring handling

Technical Notes

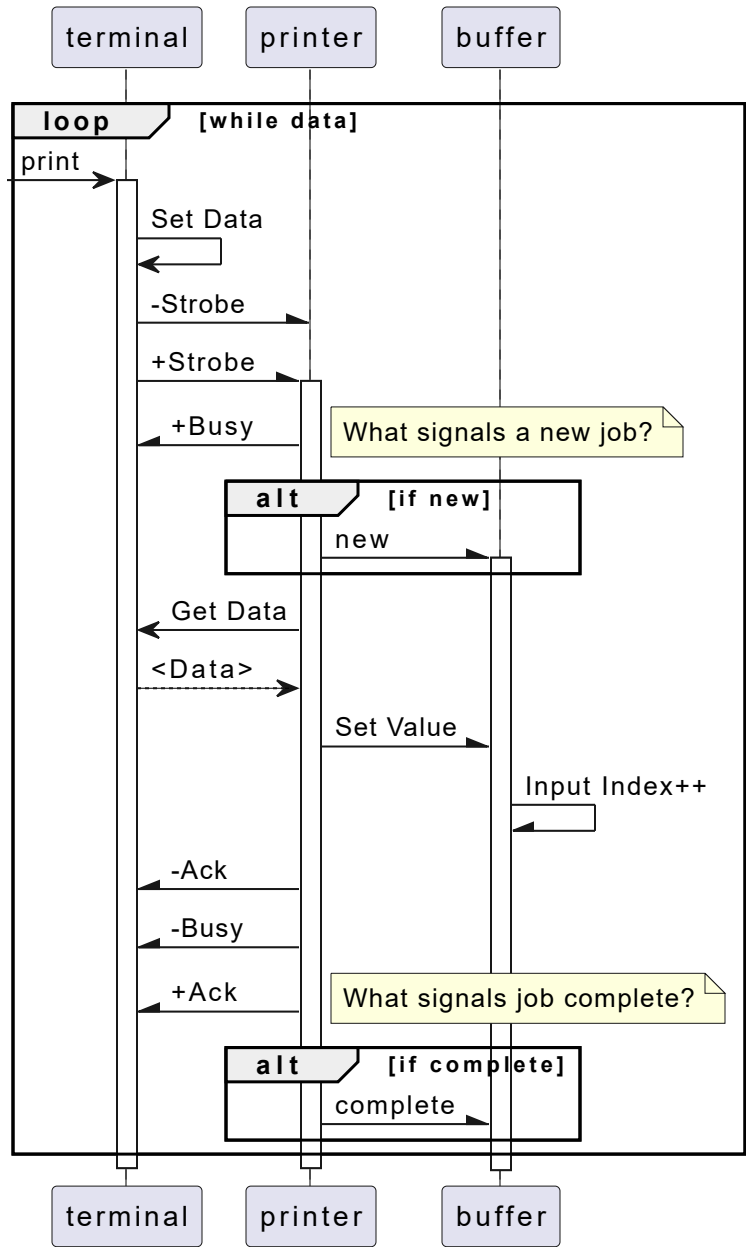
- Shields
  - [LCD and Keypad](#)
    - [OSEPP 16x2 LCD Dispaly and Keyboard Shield](#)
    - Based on suggestion, cut trace for shield pin 10 to prevent possible damage. If you want control there are other options noted in the linked reference.
      - <https://forum.arduino.cc/t/warning-to-users-of-some-vendors-lcd-keypad-shields/94673>
  - [Deek Robot Data Logger](#)
    - Parital clone of the Adafruit Data Logger v1 no support for design information from Deek-Robot available.
    - Required extensive rerouting to cleanly support the Arduino Mega 2560
      - Cut traces for shield pins 11/12/13 and reroute SPI lines (MOSI, MISO, SCLK) from ICSP header to 11/12/13 taps respectivly
      - Cut traces for pins 4,5 reouted I2C SCL/SDA to 5/4 respectively (RTC DS1307 support)
    - Added [Windbond W25Q128](#) 16MB SPI EEPROM for local storage
      - Cut static traces for pins 12/13 on the quad buffer (74HC123) from VCC power (pin 14).
      - bodge pin 13 to ground to enable 4th buffer.
      - bodge pin 12 to arduino pin 3 for chip select
      - bodge pin 11 to SPI EEPROM Chip Select
      - bodge MOSI and SCLK from the SD card to SPI EEPROM
  - [Custom IO for LPT Port](#)
    - Used 2x13 2.54mm header for 2x13 IDC to DB-25
    - header pins should be mapped as shown in the pinout table
    - note the Strobe line should be mapped to a hardware interrupt pin
    - [Line Printer Terminal](#)

Action Sequence Diagrams

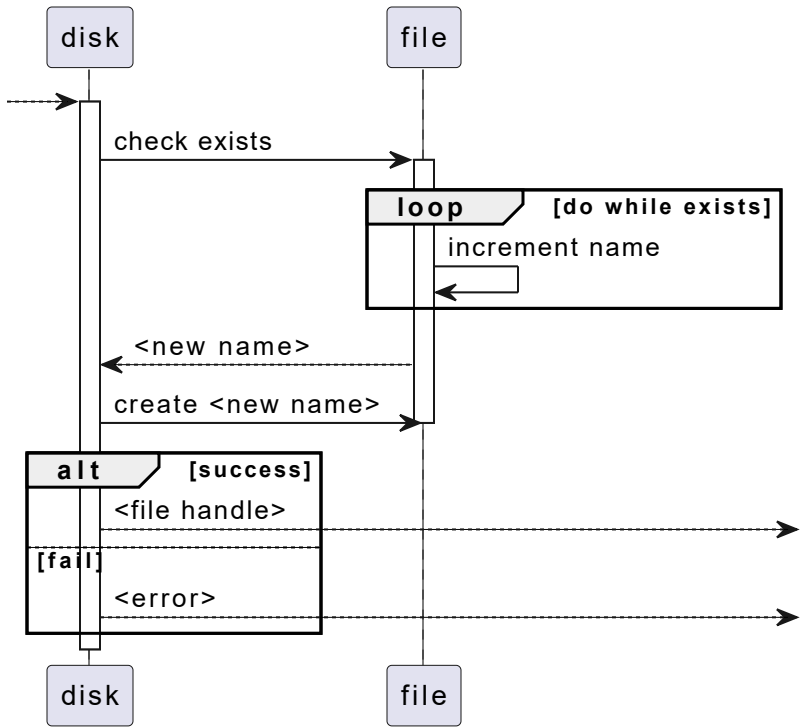
Initialize



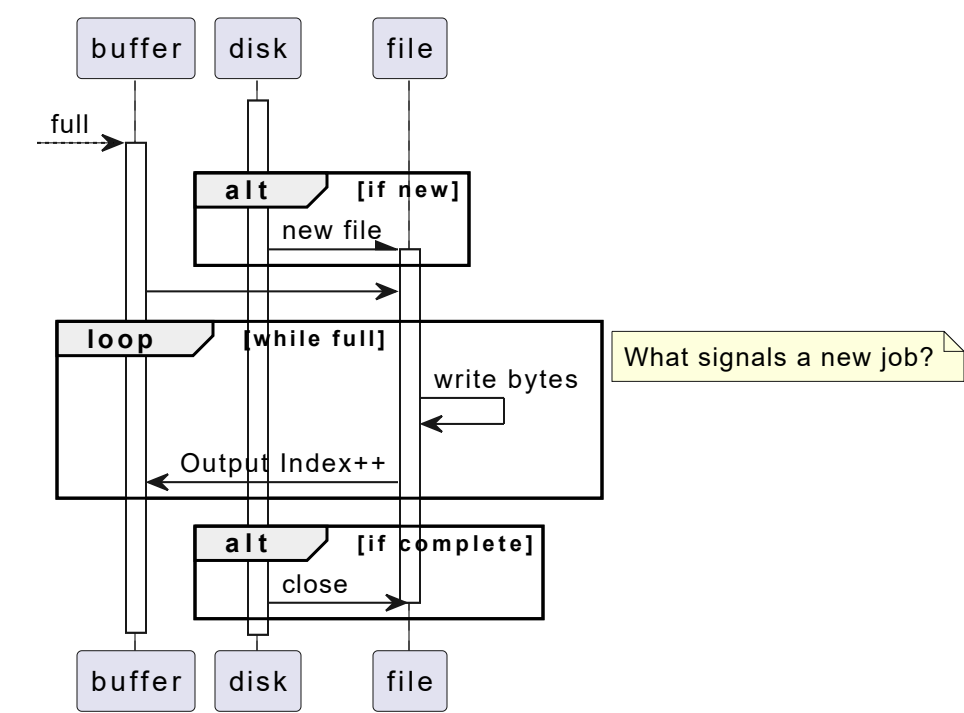
On Print



On New File



Buffer to File



Notes

- [Arduino SD Library](#)
- [SD Card with Logic Level hookup](#)
- [Deek Robot - Data Logger v1](#)
  - <https://www.hackster.io/cowboydaniel/deek-robot-datalogging-shield-tutorial-for-mega-1cd2b1>
  - [https://drive.google.com/file/d/1T5GEPMKtLjfiJvdL\\_DHEbsTk9sAlzThP/view](https://drive.google.com/file/d/1T5GEPMKtLjfiJvdL_DHEbsTk9sAlzThP/view)
- [OSEPP - 16×2 LCD Display & Keypad Shield](#)