

Dimdim's Buffalo Shield Build & Wiring Guide

For PCB Ver. 1.1

This is a brief build and wiring guide for the Arduino shield that I have designed for my TFT HiFiDuino project: <http://www.dimdim.gr/2013/09/tft-hifiduino-phase-1-complete/>.

The latest version of this file as well as all the necessary DipTrace files can be found at <http://www.dimdim.gr/diyaudio/tp-audio-buffalo-iii-dac/>.

Assuming that you have successfully etched and drilled the necessary PCB you should have ended up with something that looks like Fig. 1.

You should then proceed to mount the components, starting with the SMT parts and continuing with the rest of the parts as well as the jumpers and the headers.

When you are done, your board should resemble the one pictured in Fig.2.

If everything went according to plan, your shield should sit very neatly on an Arduino Mega or Due (see Fig. 3).

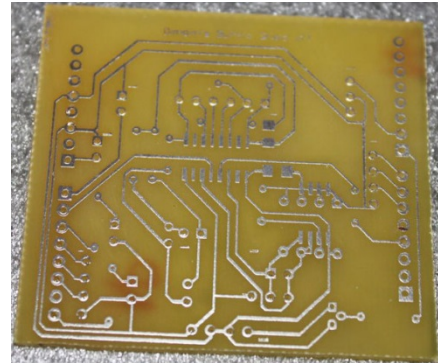


Fig. 1

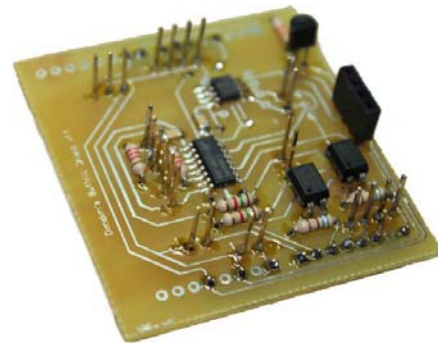


Fig. 2

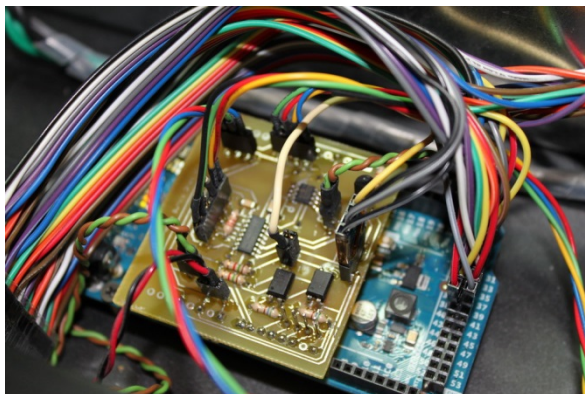
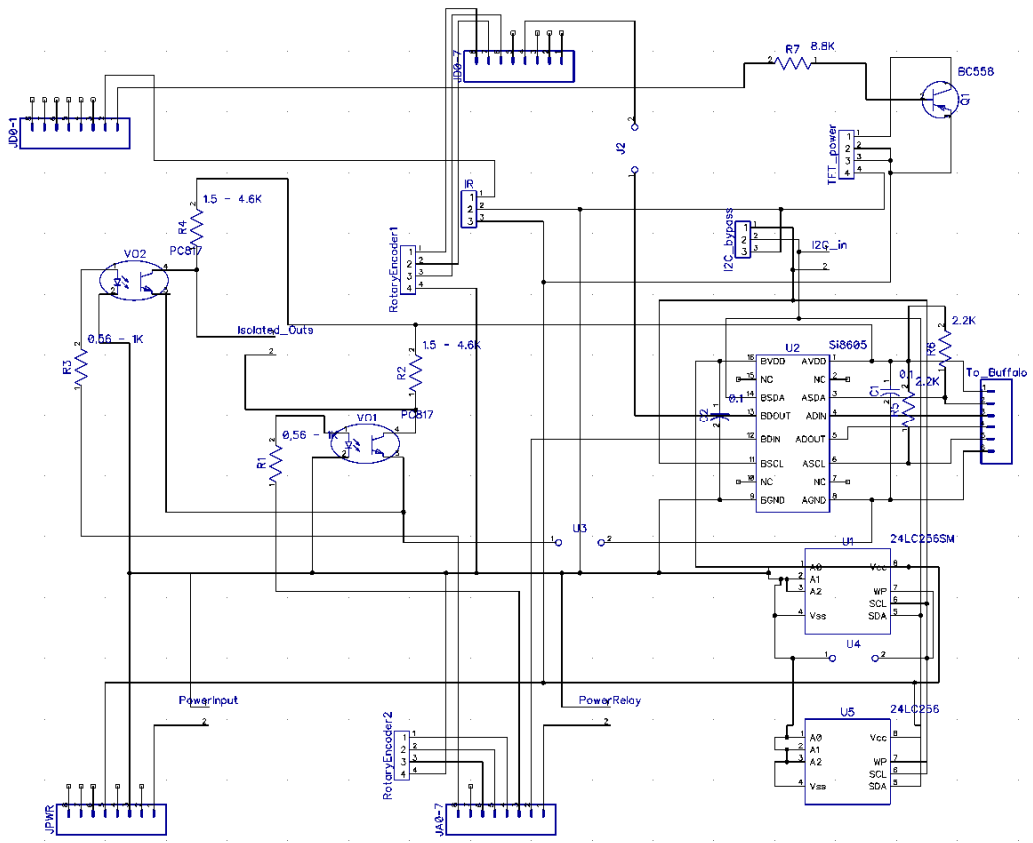


Fig. 3

This shield features:

- Galvanic isolation for the I2C signals as well as 3 digital outputs (Arduino -> Buffalo) and 1 digital input (Buffalo -> Arduino).
- EEPROM chip (24LC256) either in SMT or DIP footprint.
- Backlight control for the TFT through a PWM-controlled transistor.
- Headers for two rotary encoders.
- Output for power relay (for remote on/off).
- Header for IR receiver.

This is the schematic for the shield:



And this is the resulting PCB:

Moving on to more interesting things, what follows is meant to be a wiring reference for the shield.

IR: Use a standard 38KHz IR Receiver Module, like the TSOP4838.

- 1: Signal (Pin 9)
- 2: GND
- 3: 3.3V



RotaryEncoder1: Use any simple rotary encoder.

- 1: Left pin (Pin 7)
 - 2: Right pin (Pin 6)
 - 3: Selector pin 1 (Pin 5)
 - 4: Middle Pin & Selector pin 2 (GND)
- See picture on the right for wiring.

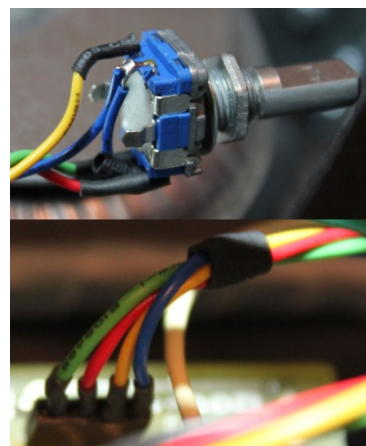
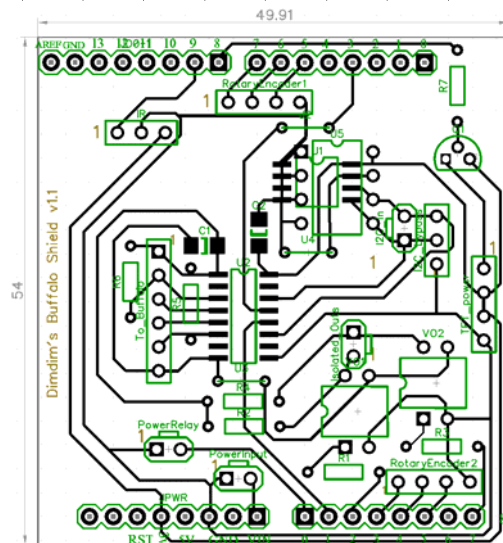
RotaryEncoder2: Use any simple rotary encoder.

- 1: Left pin (Pin A3)
 - 2: Right pin (Pin A4)
 - 3: Selector pin 1 (Pin A3)
 - 4: Middle Pin & Selector pin 2 (GND)
- See picture on the right for wiring.

I2C_In:

- 1: SDA
- 2: SCL

(note: this is the I2C connection to the Arduino. SDA should be



connected to pin 20 and SCL to pin 21)

I2C_Bypass:

- 1: GND
- 2: SDA
- 3: SCL

(use this if / when an isolator IC (U2) is not used to send the I2C signal to the Buffalo)

Isolated_Out:

- 1: Out 1 (Pin A2)
- 2: Out 2 (Pin A7)

TFT_power:

- 1: TFT Backlight LED (dimmed by Pin 8)
- 2, 3: 3.3V (for TFT power & pin RD)
- 4: GND

PowerInput:

- 1: GND
 - 2: Vin (8V-12V)
- (connect here the power supply to the Arduino)

PowerRelay:

- 1: GND
 - 2: 3.3V out (Pin A0) in case of Due, 5V in case of MEGA
- (connect here the power relay that powers on the DAC)

To_Buffalo:

- 1: Buffalo Vcc (3.3V)
- 2: SDA
- 3: Sidecar Control (Pin 3)
- 4: Lock LED input (Pin A1)
- 5: SCL
- 6: Buffalo GND

BOM:

- IR: TSOP4838
- Rotary Encoders: see pictures
- R1, R3: 0.56K – 1K 1/8W or 1/4W
- R2, R4: 1.5K – 4.6K 1/8W or 1/4W (use 1.8K if controlling an OTTO-II)
- R5, R6: 2.2K 1/8W or 1/4W
- R7: 8.8K 1/8W or 1/4W
- C1, C2: 0.1uF (SMD 1206)
- VO1, VO2: PC817
- U1: 24LC256 (SMD or DIP)
- U2: Si8605 (SMD)
- Q1: BC558