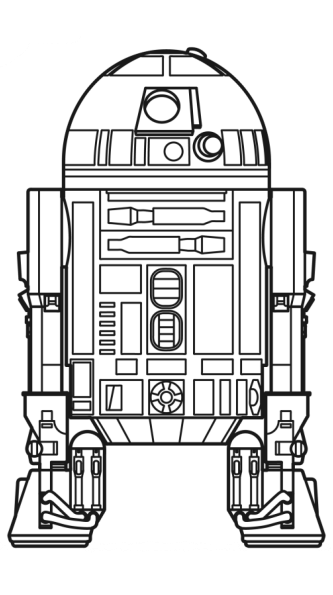


Bens R2-D2 Electronic Diagram with Shadow MD and Shady RC
v5.5 - 10/2021

www.printed-droid.com

Warning: I tried to do my best with verifiying that my connections are correct. But please don't rely on this diagram to 100% and make sure that your connections are ok.

When it comes to troubleshooting remove everything and add one item at a time. Verify everything. Add items until you run into trouble and then investigate the last added item!

The latest diagrams and files can always be found here:
http://www.printed-droid.com/files/

Update:
- Added Body MP3
- Added Gripper and Utility Arm Servos
- Added 6V Regulator info for all Servos
- Added Shady RC connections
- Added links to Firm- & Software
- Added small location diagram
- Added Switch Diagram for Marcduino Xbee/Mega
- New PCB Section at the bottom

10 AWG Wires:
50A Fuse to 50A Relais
50A Relais to 12-16V Fuse Block
12-16V Fuse Block to 12V Regulator
12V Regulator to 12V regulated Fuse Block
12-16V Fuse Block to Syren 10
12-16V Fuse Block to Sabertooth 2x32A

12 AWG Wires:
Syren 10 to Dome Motor
Sabertooth 2x32A to Feet Motors

14 AWG Wires
12V Regulated Fuse Block to Slipring/Dome
12V Regulated Fuse Block to Amplifier

16 AWG
Wires to 5V Regulators

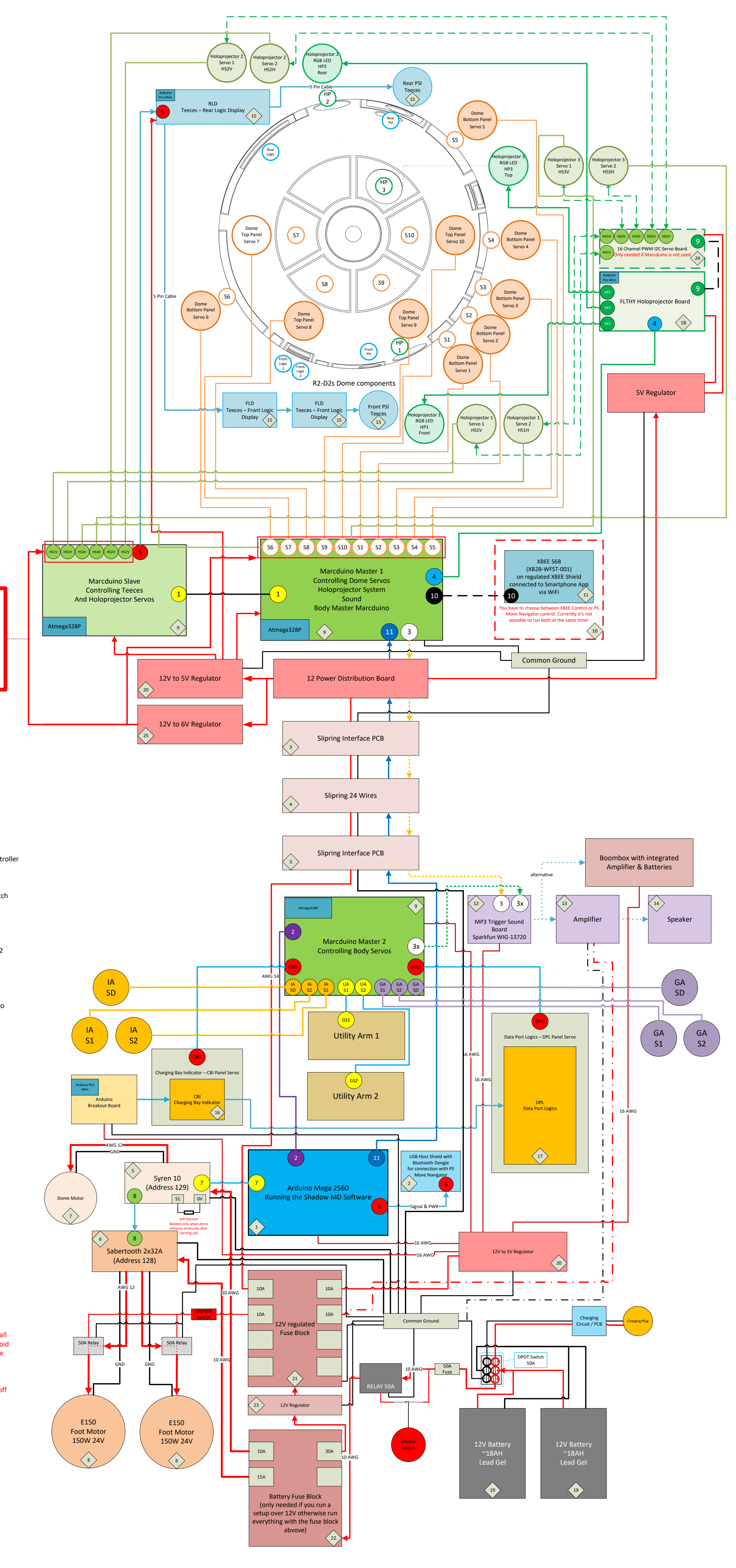
All Other Cables are Standard Servo or Signal Wires ~AWG22

There are wire connections like RLD to Rear PSI which are drawn with 1 Wire but it's a 5 wire connection

The Servos are:

6x MG90 Holoprojector Servos
4x MG90 Dome Top Panel Servos
6x MG90 Dome Bottom Panel
2x MG90 CBI & DLP Door Servos
2x MG966 Utility Arm Servos
3x MG90 Interface Arm Servos
3x MG90 Gripper Arm Servos

Instead of MG90 (metal gear) you can use SG90 (standard gear)


Holoprojector 2 Servo 1 HS2V
Holoprojector 2 Servo 2 HS2H
Holoprojector 2 RGB LED HP2 Rear
Rear PSI Teeces
RLD Teeces – Rear Logic Display
Arduino Pro Mini
5 Pin Cable
Dome Bottom Panel Servo 5
Holoprojector 3 RGB LED HP3 Top
Holoprojector 3 Servo 1 HS3V
Holoprojector 3 Servo 2 HS3H
16 Channel PWM I2C Servo Board
Only needed if Marcduino is not used
FLTHY Holoprojector Board
Dome Top Panel Servo 7
Dome Top Panel Servo 10
Dome Bottom Panel Servo 4
Dome Bottom Panel Servo 6
Dome Top Panel Servo 8
Dome Top Panel Servo 9
Dome Bottom Panel Servo 3
Dome Bottom Panel Servo 2
Dome Bottom Panel Servo 1
R2-D2s Dome components
5V Regulator
FLD Teeces – Front Logic Display
Front PSI Teeces
Holoprojector 1 RGB LED HP1 Front
Holoprojector 1 Servo 1 HS1V
Holoprojector 1 Servo 2 HS1H
Marcduino Slave Controlling Teeces And Holoprojector Servos
Atmega328P
Marcduino Master 1 Controlling Dome Servos Holoprojector System Sound Body Master Marcduino
XBEE S6B (XB2B-WFST-001) on regulated XBEE Shield connected to Smartphone App via WiFi
You have to choose between XBEE Control or PS Move Navigator control. Currently it's not possible to run both at the same time!
Common Ground
12V to 5V Regulator
12 Power Distribution Board
12V to 6V Regulator
Slipring Interface PCB
Slipring 24 Wires
Slipring Interface PCB
Boombox with integrated Amplifier & Batteries
alternative
MP3 Trigger Sound Board Sparkfun WIG-13720
Amplifier
Speaker
Marcduino Master 2 Controlling Body Servos
AWG 14
IA SD
IA S1
IA S2
GA SD
GA S1
GA S2
Utility Arm 1
Utility Arm 2
Charging Bay Indicator – CBI Panel Servo
CBI Charging Bay Indicator
Arduino Breakout Board
Data Port Logics – DPL Panel Servo
DPL Data Port Logics
16 AWG
Dome Motor
Syren 10 (Address 129)
10K Resistor Needed only when dome behaves erratically after starting up)
Arduino Mega 2560 Running the Shadow MD Software
USB Host Shield with Bluetooth Dongle for connection with PS Move Navigator
Signal & PWR
Sabertooth 2x32A (Address 128)
12V to 5V Regulator
AWG 12
GND
10 AWG
ON/OFF Switch
50A Relay
12V regulated Fuse Block
Common Ground
Charging Circuit / PCB
Charging Plug
DPDT Switch 50A
50A Fuse
RELAY 50A
12V Regulator
Master Switch
E150 Foot Motor 150W 24V
12V Battery ~18AH Lead Gel
Battery Fuse Block (only needed if you run a setup over 12V otherwise run everything with the fuse block abvove)

Please use only the Servo Signal wires (orange) for connection to the Marcduino!

The GND and Positive wires should go to a voltage regulator with stable 6V!!!

SAME WITH THE BODY SERVOS!!!

Links to Firm- & Softwares:

Shadow MD:
https://astromech.net/droidwiki/SHADOW_MD
https://astromech.net/forums/showthread.php?21984-SHADOW-Marcduino-Update-Thread

Padawan Shadow:
https://astromech.net/droidwiki/PADAWAN_SHADOW
http://astromech.net/forums/showthread.php?19298-S-H-A-D-O-W-Padawan-based-mini-PS3-Controller
https://gitlab.com/darren-blum/SHADOW

Shady RC dEvolution:
https://astromech.net/droidwiki/Shady_RC_dEvolution#Shady_RC_dEvolution_SHADOW_MD_Sketch
https://github.com/joymonkey/dEvolution

Marcduino:
https://www.curiousmarc.com/r2-d2/marcduino-system
https://astromech.net/forums/showthread.php?38382-Shady-RC-dEvolution-control
https://astromech.net/forums/showthread.php?38288-JoyMonkey-s-R2-Build-Log-Episode-2/page2

Teeces:
https://www.curiousmarc.com/r2-d2/teeces-dome-lights

XBEE:
https://www.curiousmarc.com/r2-d2/marcduino-system/marcduino-boards/installing-the-wifi-radio

The Relais are used to cut the power supply completely.
The Master Switch should close the Master Relay. This will automatically Close the Feet Motor relais and the Motors will have power abvailable.

If you turn your Droid off with the Master Switch, all Relais should open and this allows to move the Droid without generating electricity that goes back to the Sabertooth and could destroy it.

If you want du move the Droid while still powered on, you have to use the Feet Motor Switch to cut off the power to the relais to avoid killing your Sabertooth!!!

- 1 3 Wire Connection from Marcduino Master to Slave (Ground - 5V - Signal)
- 2 1 Wire Connection from Arduino Mega Serial 3 (Tx Pin 14) to Marcduino Body Master (Rx)
- 3 3 Wire Connection (Signal - Ground - 5V) from Marcduino Output MP3/ Teeces to MP3 Trigger Input 5V FTDI (RX - 5V/VCC - Ground)
- 3X If you use a Body Master Marcduino you can trigger the MP3s from here! 3 Wire Connection (Signal - Ground - 5V) from Marcduino Output MP3/ Teeces to MP3 Trigger Input 5V FTDI (RX - 5V/VCC - Ground)
- 4 3 Wire I2C Connection Marcduino SDA to FlthyHP D, Marcduino SCL to FlthyHP C & Marcduino Ground to FlthyHP G
- 5 3 Wire Connection (Signal - 5V - Ground) from Marcduino Slave MP3/Teeces to the Teeces Arduino (RX - 5V - Ground)
- 6 Just a USB Host Shield sitting on the Mega 2560 with a Class 1 CSR 4.0 USB Bluetooth Dongle inserted
- 7 2 Wire Signal Connection Arduino Serial2 (Tx2 Pin 16) to Syren10 S1 & Arduino GND to Syren 0v
- 8 2 Wire Signal Connection from: Syren10 S1 (Mega Pin 16) to Sabertooth S1 Syren10 0v (Arduino GND) to Sabertooth 0v Serial Lines are chained from Syren!
- 9 6 Wire I2C Connection from I2C Servo Breakout Pins (G OE C D Vcc V+) to PWM Board (GND OE SCL SDA Vcc V+) only necessary if the Holoprojector servos are not connected to the Slave Marcduino
- 10 4 Wire Connection from Marcduino Interconnect to XBEE Shield (Ground 5V DOUT DIN) You have to choose between XBEE Control or PS Move Navigator control. Currently it's not possible to run both at the same time!
- 11 1 Wire Connection from Arduino Mega Serial 1 (Tx Pin 18) to Marcduino Dome Master (Rx)
- CBIS CBIS is the CBI Door Servo. The Servo is connected to the Body Marcduino Pin 3 This is a standard 3 wire Servo connection, 5V, Signal, Ground but please connect servo power to a stable 6V source
- DPLS DPLS is the DPL Door Servo. The Servo is connected to the Body Marcduino Pin 4 This is a standard 3 wire Servo connection, 5V, Signal, Ground but please connect servo power to a stable 6V source

XXX Number refering to Electronics BOM and the PCB Pictures below

Electronics BOM:

https://docs.google.com/spreadsheets/d/1EhwsvKlSnYgEmawRqciR4KCTsDLp68p6iLbMrdwMvOA/edit?usp=sharing

HP HP1 – HP3 are the Holoprojector LEDs. The are connected to the FlthyHoloprojector Board
HP1 to Pin Digital 2
HP2 to Pin Digital3
HP3 to Pin Digital 4
This is a 3 wire connection, 5V, Signal, Ground

HS HS are the Holoprojector Servos. The Number is for which Holoprojector and V means Vertical movement and H is Horizontal Movement.

Best way to connect them is via the Marcduino Slave:
HS1H to Pin 2
HS1V to Pin 1
HS2H to Pin 4
HS2V to Pin 3
HS3H to Pin 6
HS3V to Pin 5

Alternative connect them to the I2C PWM Board:
HS1H to PWM 0
HS1V to PWM 1
HS2H to PWM 2
HS2V to PWM 3
HS3H to PWM 4
HS3V to PWM 5

This is a standard 3 wire Servo connection, 5V, Signal, Ground

S S1-S10 are the Dome Panel Servos
They are connected to the Dome Master Marcduino. Corresponding to the Pins on the Marcduino.
For example S1 goes to Pin 1, S2 to Pin 2 and so on
This is a standard 3 wire Servo connection, 5V, Signal, Ground but please connect servo power to a stable 6V source

UAS UA are the Utility Arm Servos. UA1 is the upper Utility Arm, UA2 is the lower UtilityArm. They are connected to the Body Master Marcduino.

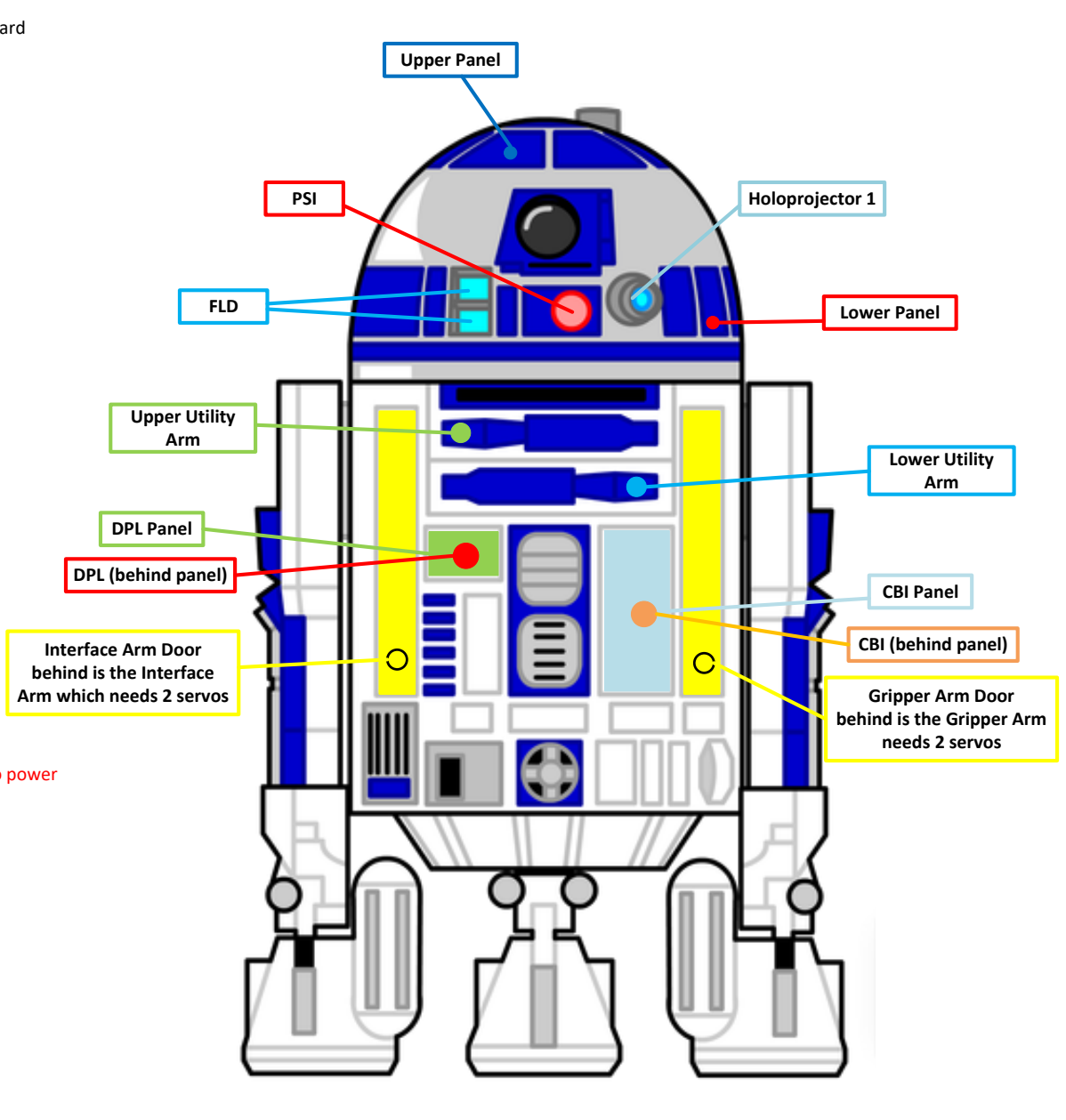
But be aware you have to modify the Marcduino Firmware for Body Servos!
This is a standard 3 wire Servo connection, 5V, Signal, Ground but please connect servo power to a stable 6V source

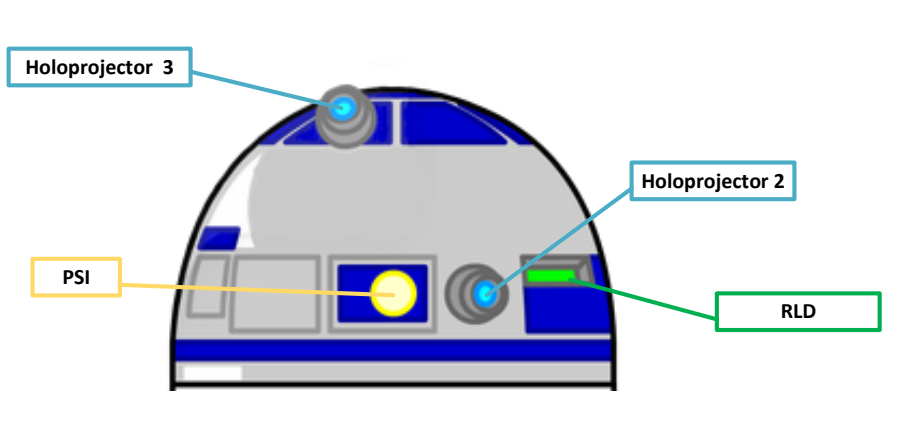
IAS IAS are the Gripper Arm Servos. IASD is the Gripper Arm Door Servo, IAS1 is the 1st Servo for the Gripper Arm and IAS2 is the second Gripper Arm Servo.
They are connected to the Body Master Marcduino.

But be aware you have to modify the Marcduino Firmware for Body Servos!
This is a standard 3 wire Servo connection, 5V, Signal, Ground but please connect servo power to a stable 6V source

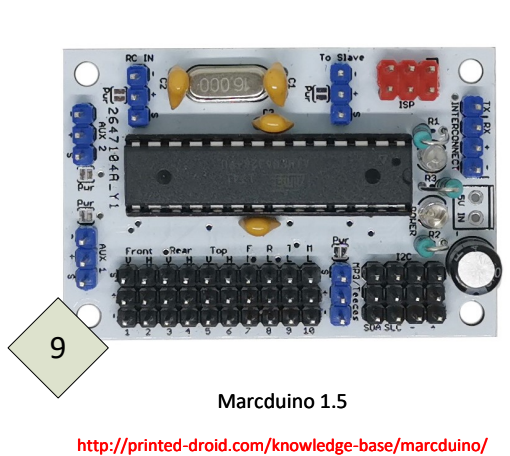
GAS GAS are the Gripper Arm Servos. GASD is the Gripper Arm Door Servo, GAS1 is the 1st Servo for the Gripper Arm and GAS2 is the second Gripper Arm Servo.
They are connected to the Body Master Marcduino.

But be aware you have to modify the Marcduino Firmware for Body Servos!
This is a standard 3 wire Servo connection, 5V, Signal, Ground but please connect servo power to a stable 6V source

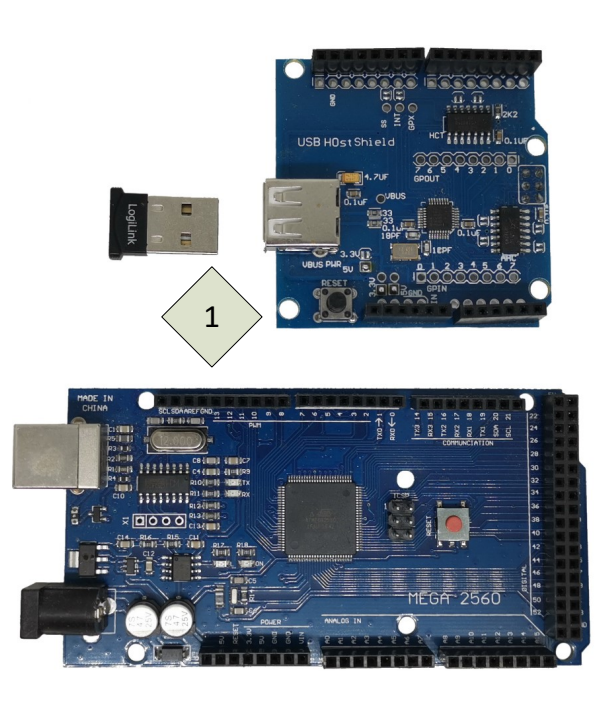




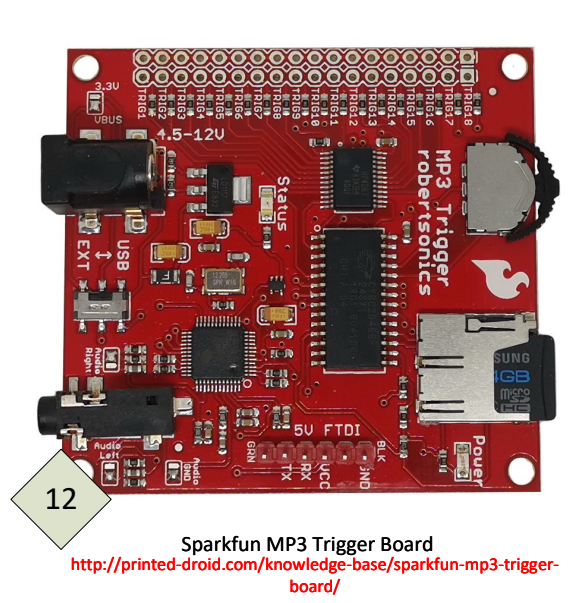
Those are almost all PCBs listet in the Diagram above


9

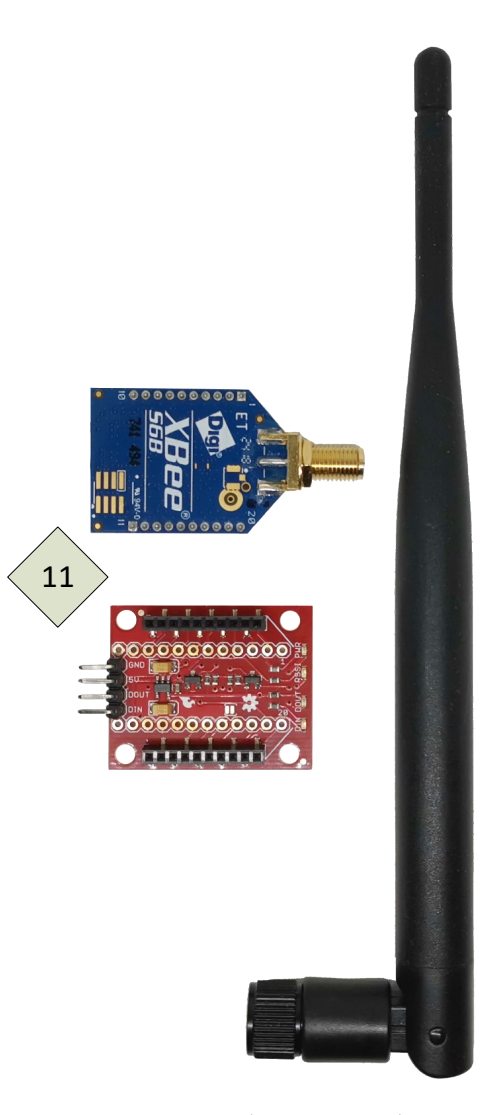
Marcduino 1.5
http://printed-droid.com/knowledge-base/marcduino/


1

Arduino Mega 2560, USB Host Shield, Class 1 CSR 4.0 USB Bluetooth Dongle
http://printed-droid.com/knowledge-base/shadow-md-droid-control-system/


12

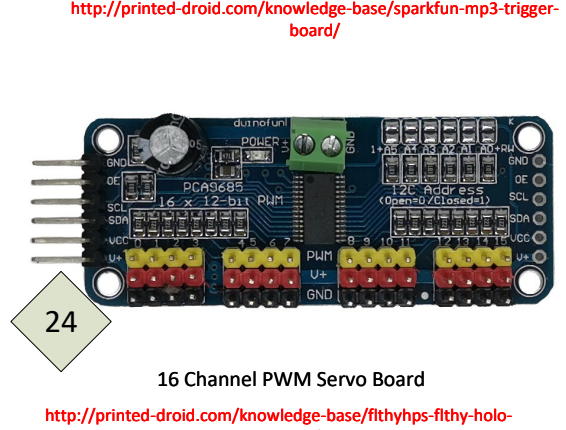
Sparkfun MP3 Trigger Board
http://printed-droid.com/knowledge-base/sparkfun-mp3-trigger-board/


11

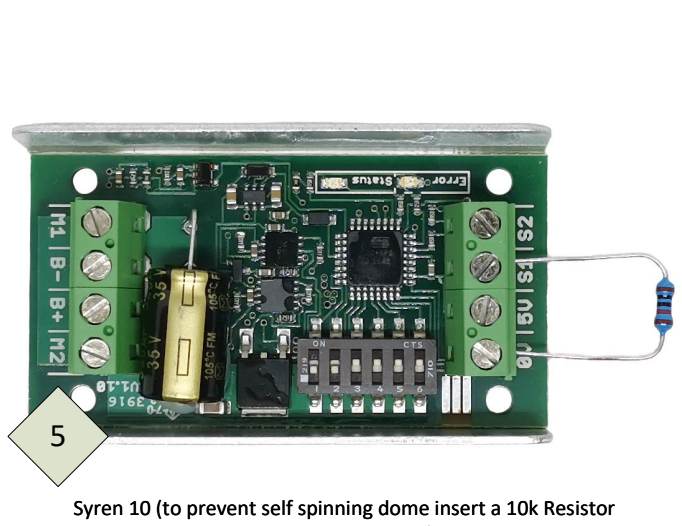
XBEE S6B (XB2B-WFST-001) Board (WRL-11373) with 6dB Antenna
http://printed-droid.com/knowledge-base/xbee-system/

3

Printed Droid Fused 24 Wire Slipring Adapter Board
http://printed-droid.com/knowledge-base/r-series-24-wire-slip-ring-interface/


24

16 Channel PWM Servo Board
http://printed-droid.com/knowledge-base/flthyhps-flthy-holo-projectors/


5

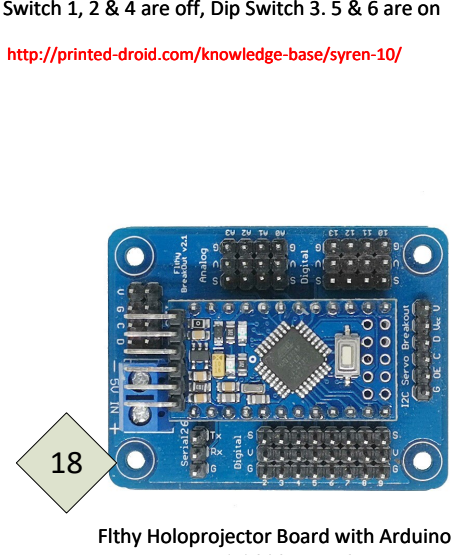
Syren 10 (to prevent self spinning dome insert a 10k Resistor between S1 and 0V)
Syren10 needs to be used in Packetized Serial Mode (Address 129)
Dip Switch 1, 2 & 4 are off, Dip Switch 3. 5 & 6 are on
http://printed-droid.com/knowledge-base/syren-10/

6

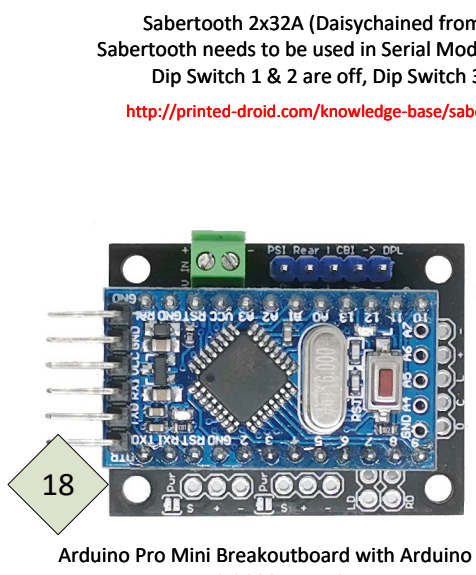
Sabertooth 2x32A (Daisychained from Syren 10)
Sabertooth needs to be used in Serial Mode (Address 128)
Dip Switch 1 & 2 are off, Dip Switch 3-6 are on
http://printed-droid.com/knowledge-base/sabertooth-2x32a/

Holoprojector (7bit RGB Led, at the back with 3-6 wires slipring - 12.5mm diameter)
http://printed-droid.com/knowledge-base/flthyhps-flthy-holo-projectors/

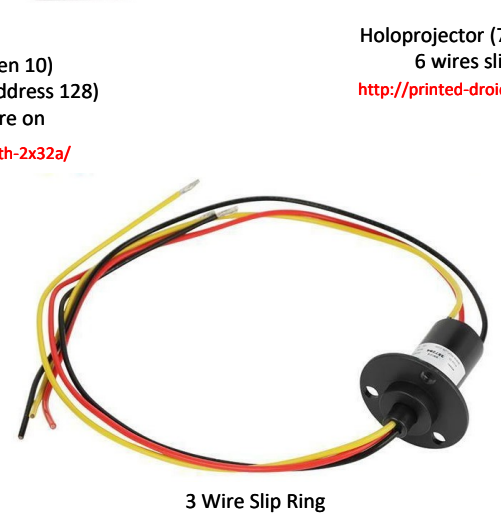
Fuse Block
http://printed-droid.com/knowledge-base/fuse-block/


18

Flthy Holoprojector Board with Arduino Pro Mini 328P 5V 16Hz (also usable for CBI-DPL)
http://printed-droid.com/knowledge-base/flthyhps-flthy-holo-projectors/


18

Arduino Pro Mini Breakoutboard with Arduino Pro Mini 328P 5V 16Hz (for CBI-DPL or Teeces PSI only)
http://printed-droid.com/knowledge-base/arduino-pro-mini-breakoutboard/

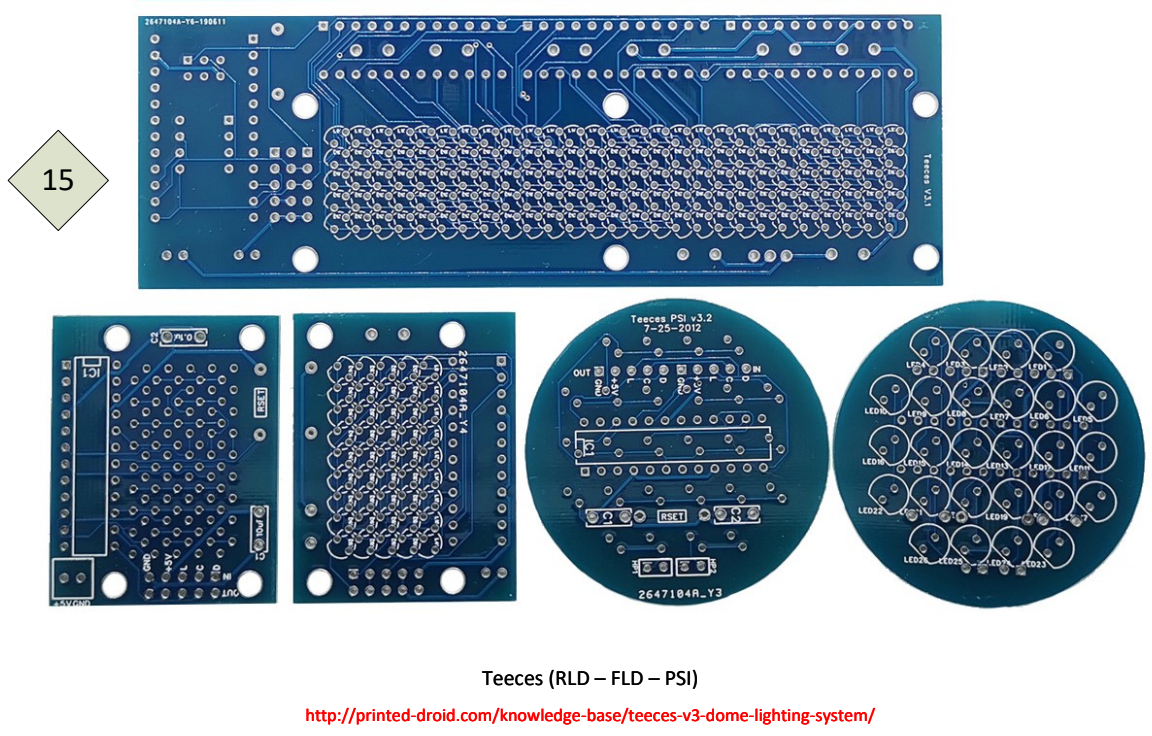

3 Wire Slip Ring
http://printed-droid.com/knowledge-base/slip-rings/

4

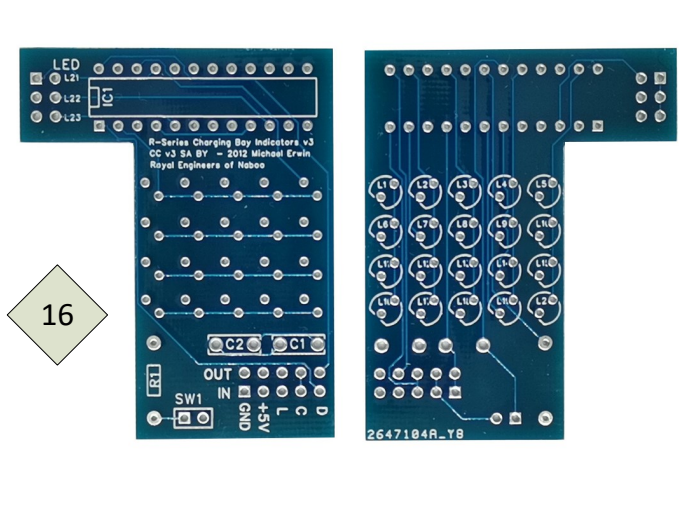
24 Wire Slip Ring
http://printed-droid.com/knowledge-base/slip-rings/

20

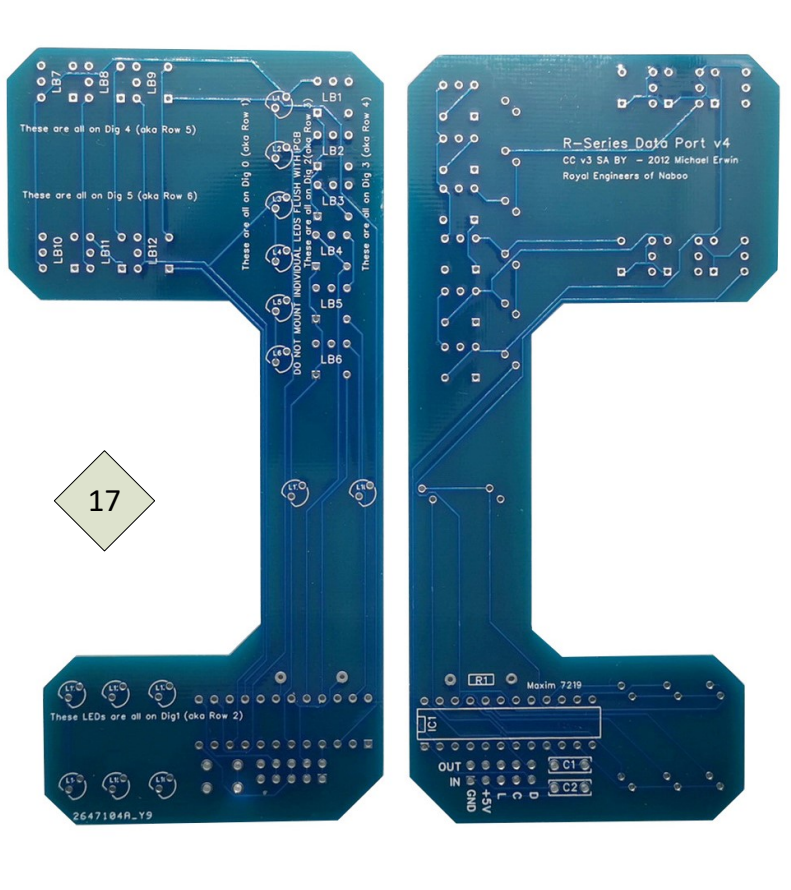
LM2596 Voltage Regulator
http://printed-droid.com/knowledge-base/voltage-regulator/


15

Teeces (RLD – FLD – PSI)
http://printed-droid.com/knowledge-base/teeces-v3-dome-lighting-system/

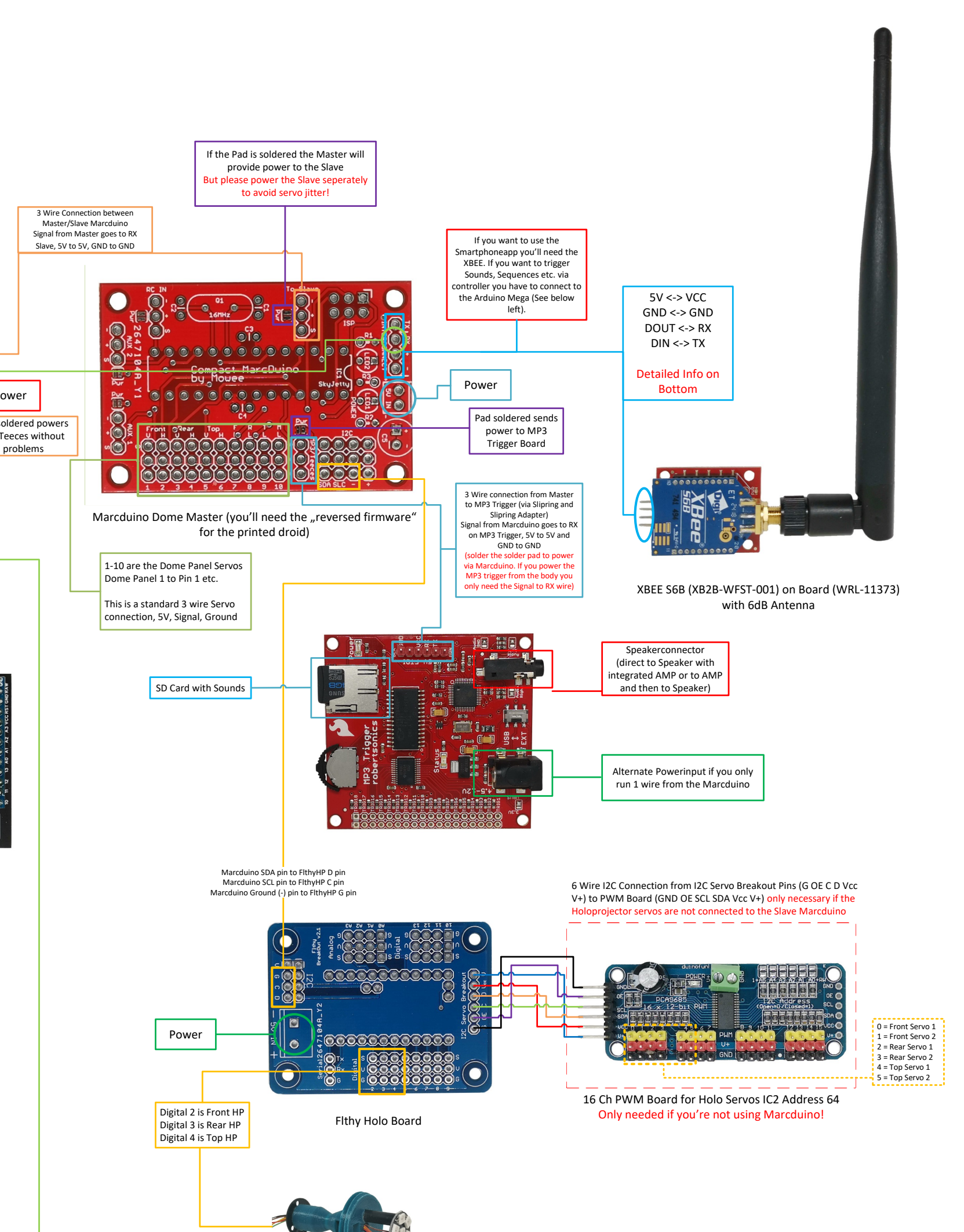

16

CBI – Charging Bay Indicators
http://printed-droid.com/knowledge-base/charging-bay-indicators/


17

DPL – Dataport Logics
http://printed-droid.com/knowledge-base/data-port-logics/

The connections with PCB pictures:



3 Wire Connection between Master/Slave Marcduino Signal from Master goes to RX Slave, 5V to 5V, GND to GND

If the Pad is soldered the Master will provide power to the Slave
But please power the Slave seperately to avoid servo jitter!

If you want to use the Smartphoneapp you'll need the XBEE. If you want to trigger Sounds, Sequences etc. via controller you have to connect to the Arduino Mega (See below left).

Marcduino Dome Master (you'll need the „reversed firmware" for the printed droid)

1-10 are the Dome Panel Servos Dome Panel 1 to Pin 1 etc.

This is a standard 3 wire Servo connection, 5V, Signal, Ground

3 Wire connection from Master to MP3 Trigger (via Slipring and Slipring Adapter) Signal from Marcduino goes to RX on MP3 Trigger, 5V to 5V and GND to GND (solder the solder pad to power via Marcduino. If you power the MP3 trigger from the body you only need the Signal to RX wire)

XBEE S6B (XB2B-WFST-001) on Board (WRL-11373) with 6dB Antenna

Speakerconnector (direct to Speaker with integrated AMP or to AMP and then to Speaker)

Alternate Powerinput if you only run 1 wire from the Marcduino

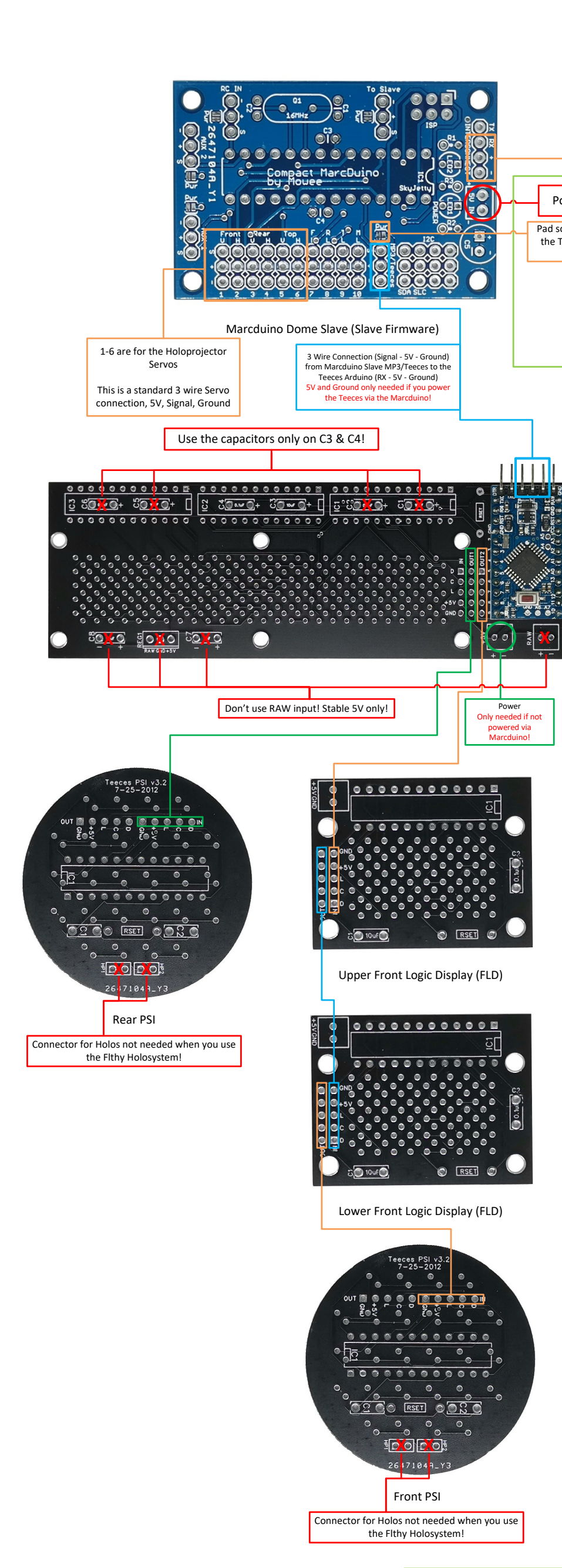
Marcduino SDA pin to FlthyHP D pin
Marcduino SCL pin to FlthyHP C pin
Marcduino Ground (-) pin to FlthyHP G pin

6 Wire I2C Connection from I2C Servo Breakout Pins (G OE C D Vcc V+) to PWM Board (GND OE SCL SDA Vcc V+) only necessary if the Holoprojector servos are not connected to the Slave Marcduino

Flthy Holo Board

16 Ch PWM Board for Holo Servos IC2 Address 64
Only needed if you're not using Marcduino!

Holoprojector RGB LED (at the back is a slipring)



Marcduino Dome Slave (Slave Firmware)

Pad soldered powers the Teeces without problems

1-6 are for the Holoprojector Servos

This is a standard 3 wire Servo connection, 5V, Signal, Ground

3 Wire Connection (Signal - 5V - Ground) from Marcduino Slave MP3/Teeces to the Teeces Arduino (RX - 5V - Ground)
5V and Ground only needed if you power the Teeces via the Marcduino!

Use the capacitors only on C3 & C4!

Don't use RAW input! Stable 5V only!

Power
Only needed if not powered via Marcduino!

Rear PSI

Connector for Holos not needed when you use the Flthy Holosystem!

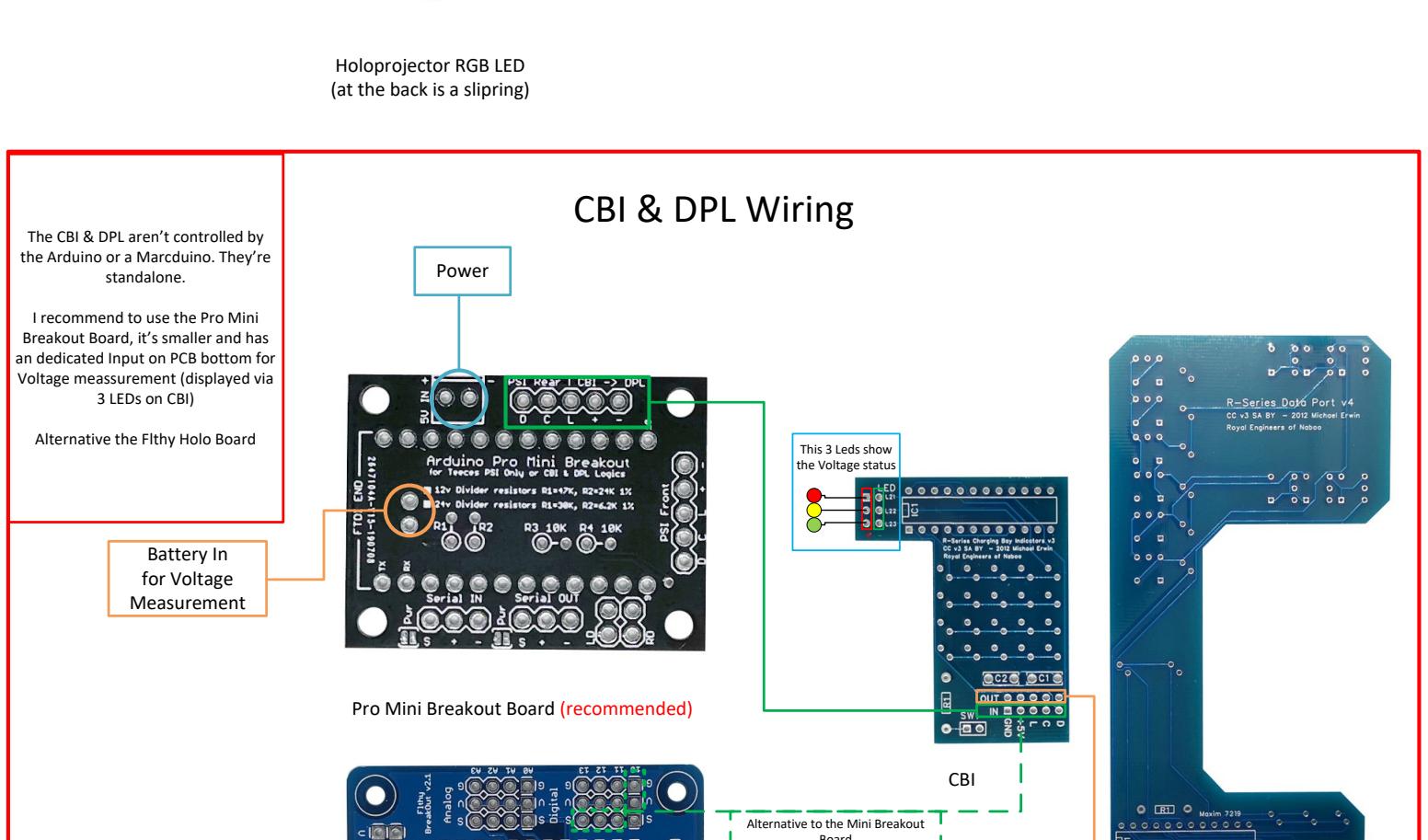
Upper Front Logic Display (FLD)

Lower Front Logic Display (FLD)

Front PSI

Connector for Holos not needed when you use the Flthy Holosystem!

CBI & DPL Wiring


Power
Battery In for Voltage Measurement
This 3 Leds show the Voltage status
Power
CBI
DPL

The CBI & DPL aren't controlled by the Arduino or a Marcduino. They're standalone.

I recommend to use the Pro Mini Breakout Board, it's smaller and has an dedicated Input on PCB bottom for Voltage meassurement (displayed via 3 LEDs on CBI)

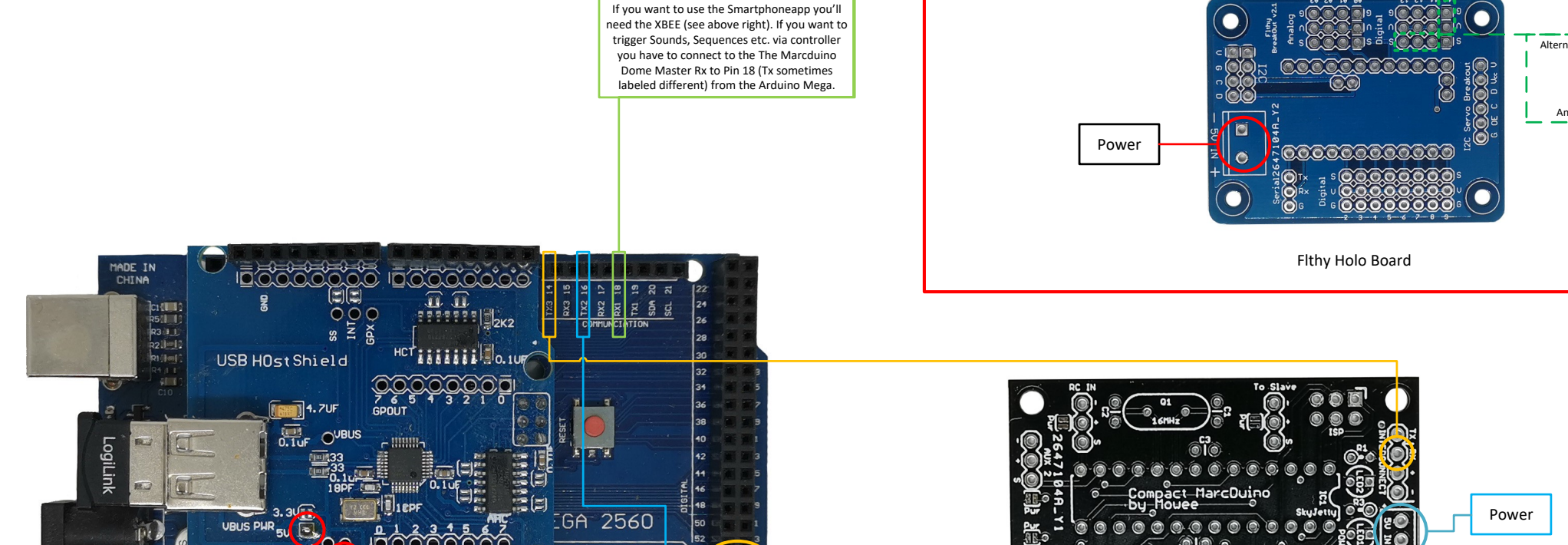
Alternative the Flthy Holo Board

Pro Mini Breakout Board (recommended)

Alternative to the Mini Breakout Board
Signal Pin 11 to L
Signal Pin 12 to C
Signal Pin 13 to D
And 5v to 5v, Gnd to Gnd

Flthy Holo Board

If you want to use the Smartphoneapp you'll need the XBEE (see above right). If you want to trigger Sounds, Sequences etc. via controller you have to connect to the The Marcduino Dome Master Rx to Pin 18 (Tx sometimes labeled different) from the Arduino Mega.

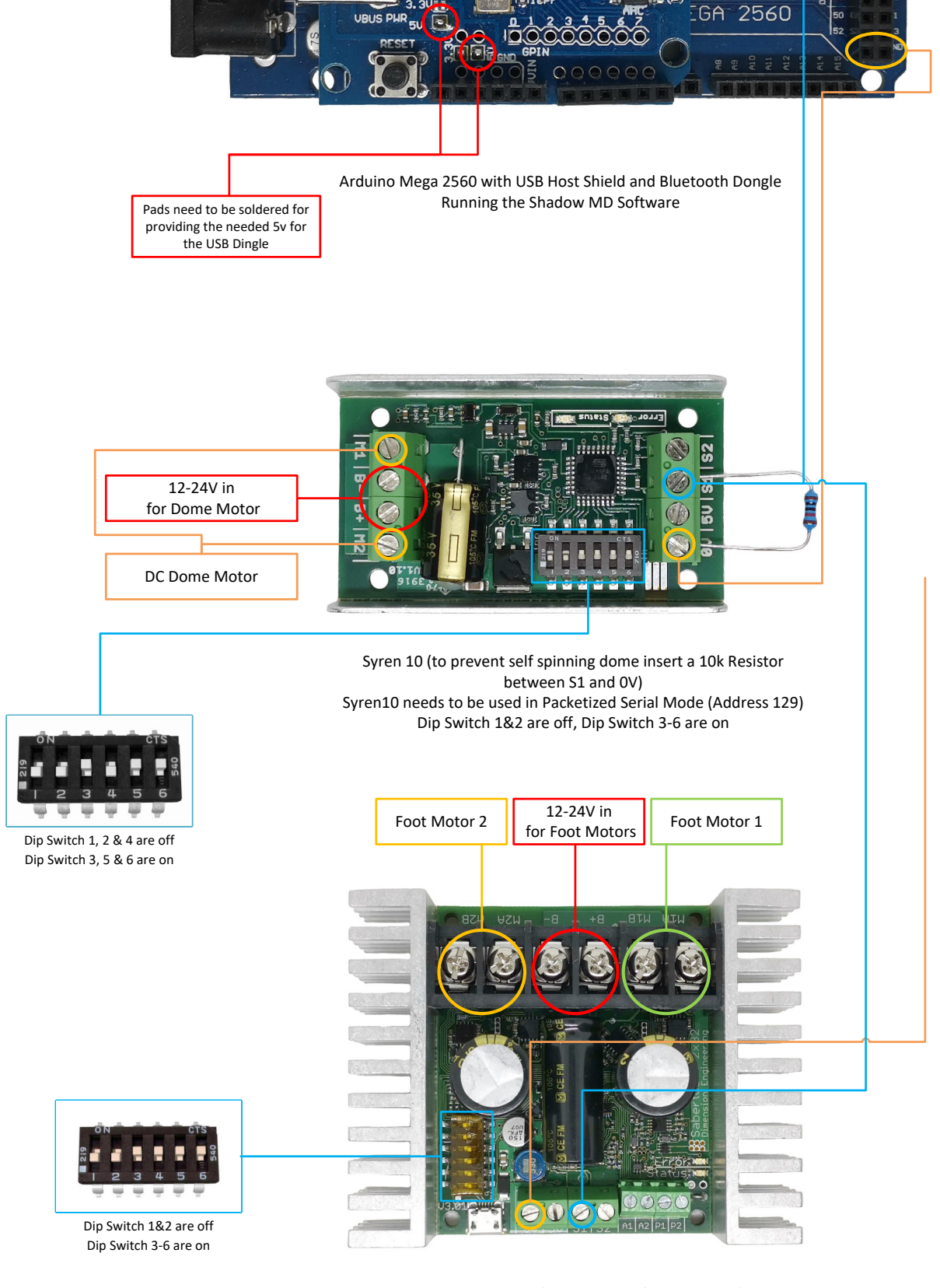


Arduino Mega 2560 with USB Host Shield and Bluetooth Dongle
Running the Shadow MD Software

Pads need to be soldered for providing the needed 5v for the USB Dingle

Marcduino Body Master

1 is Upper Gripper Arm Servo
2 is Lower Gripper Arm Servo
3 is CBI Door Servo
4 is DPL Door Servo



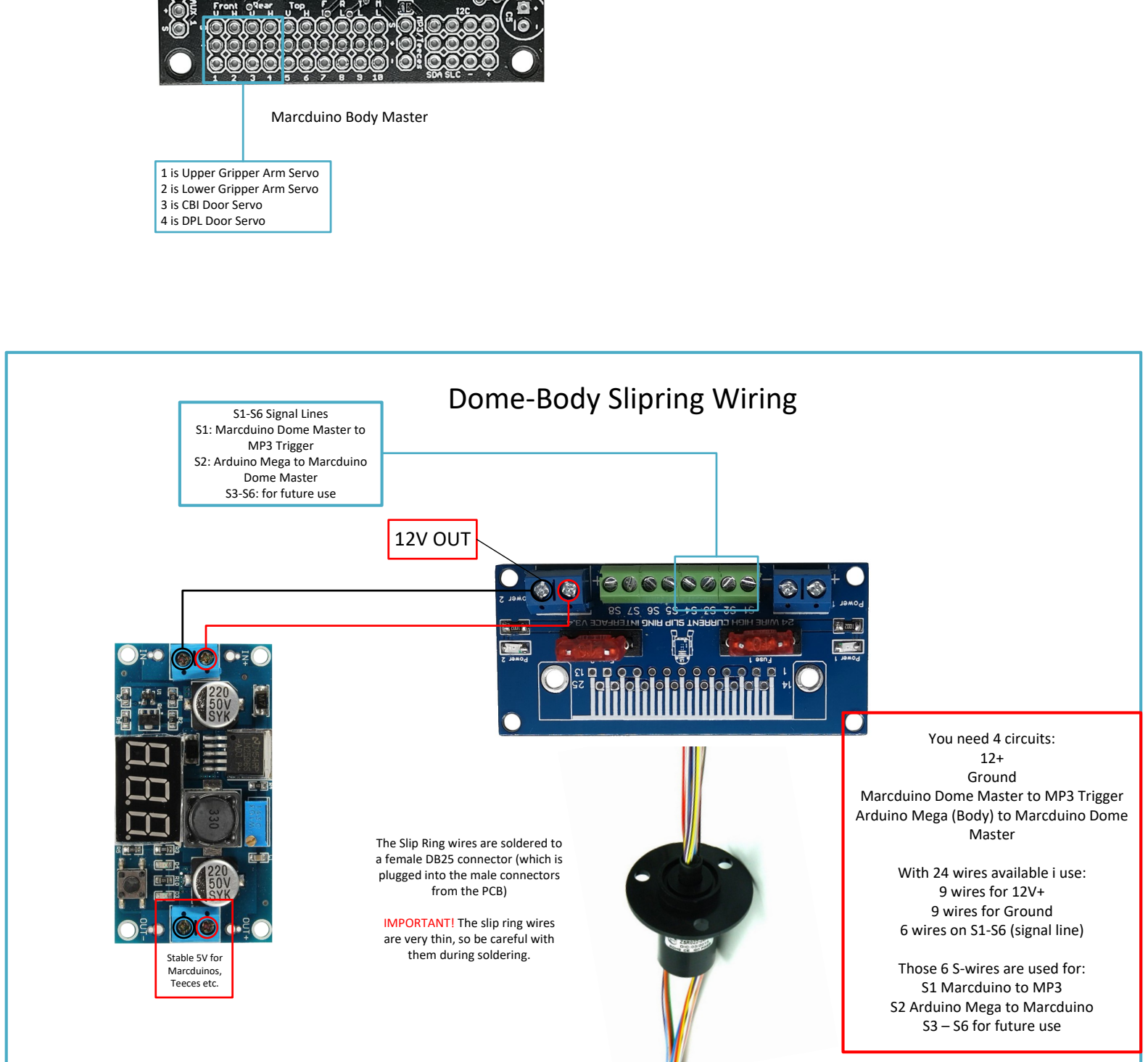
Syren 10 (to prevent self spinning dome insert a 10k Resistor between S1 and 0V)
Syren10 needs to be used in Packetized Serial Mode (Address 129)
Dip Switch 1&2 are off, Dip Switch 3-6 are on

Dip Switch 1, 2 & 4 are off
Dip Switch 3, 5 & 6 are on

Dip Switch 1&2 are off
Dip Switch 3-6 are on

Sabertooth 2x32A (Daisychained from Syren 10)
Sabertooth needs to be used in Serial Mode (Address 128)
Dip Switch 1&2 are off, Dip Switch 3-6 are on

Dome-Body Slipring Wiring



S1-S6 Signal Lines
S1: Marcduino Dome Master to MP3 Trigger
S2: Arduino Mega to Marcduino Dome Master
S3-S6: for future use

The Slip Ring wires are soldered to a female DB25 connector (which is plugged into the male connectors from the PCB)

IMPORTANT! The slip ring wires are very thin, so be careful with them during soldering.

You need 4 circuits:
12+
Ground
Marcduino Dome Master to MP3 Trigger
Arduino Mega (Body) to Marcduino Dome Master

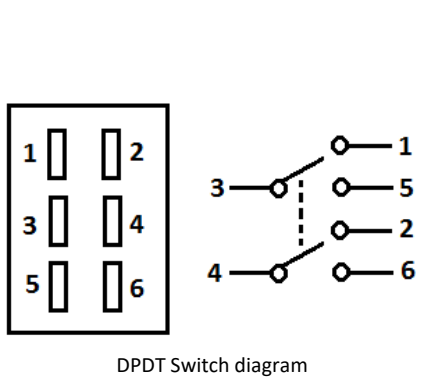
With 24 wires available i use:
9 wires for 12V+
9 wires for Ground
6 wires on S1-S6 (signal line)

Those 6 S-wires are used for:
S1 Marcduino to MP3
S2 Arduino Mega to Marcduino
S3 – S6 for future use

S1-S6 Signal Lines
S1: Marcduino Dome Master to MP3 Trigger
S2: Arduino Mega to Marcduino Dome Master
S3-S6: for future use

Printed Droid Fused 24 Wire Slipring Adapter Board
http://printed-droid.com/knowledge-base/r-series-24-wire-slip-ring-interface/

Switching between MarcduinoApp and Shadow MD


DPDT Switch diagram

A DPDT toggle switch has 6 terminals. Terminals 3 and 4 represent the toggle switch. These terminals receive the power necessary to drive the loads on terminals 1 and 5 and 2 and 6. Terminal 3 can flip between terminals 1 and 5. Terminal 4 can flip between terminals 2 and 6.

A DPDT switch has 2 input switches which can each connect to one of 2 terminals. Therefore, it can control 4 different circuits, or devices, with 2 switches.

To use Marcduino you can use the Controller to trigger sequences etc. or you can use the Smartphone App.

Currently it's not possible to use both simultaniously!

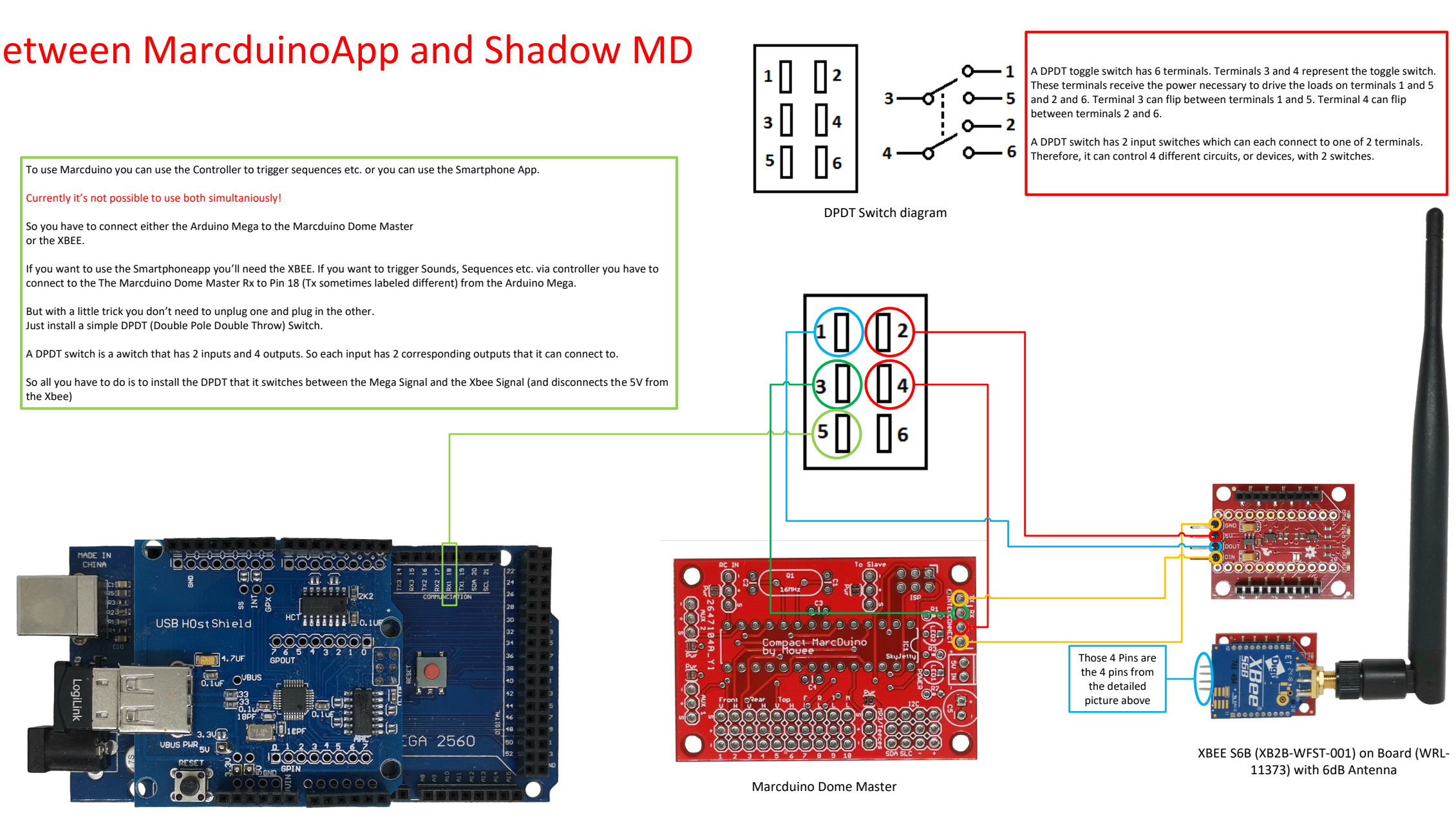
So you have to connect either the Arduino Mega to the Marcduino Dome Master or the XBEE.

If you want to use the Smartphoneapp you'll need the XBEE. If you want to trigger Sounds, Sequences etc. via controller you have to connect to the The Marcduino Dome Master Rx to Pin 18 (Tx sometimes labeled different) from the Arduino Mega.

But with a little trick you don't need to unplug one and plug in the other.
Just install a simple DPDT (Double Pole Double Throw) Switch.

A DPDT switch is a awitch that has 2 inputs and 4 outputs. So each input has 2 corresponding outputs that it can connect to.

So all you have to do is to install the DPDT that it switches between the Mega Signal and the Xbee Signal (and disconnects the 5V from the Xbee)



Those 4 Pins are the 4 pins from the detailed picture above

Marcduino Dome Master

XBEE S6B (XB2B-WFST-001) on Board (WRL-11373) with 6dB Antenna

Arduino Mega 2560 with USB Host Shield and Bluetooth Dongle
Running the Shadow MD Software

Using Shady RC & Marcduino

Joymonkey developed a new Firmware for the Master Arduino that could handle RC Input with Shadow MD.

The Shady RC Sketch will allow to control foot and dome motors with the Turnigy Evolution and the Marcduinos are triggered via the SmartphoneApp (so the Xbee Setup is needed)
You'll need the Turnigy Evolution RC Controller with the iA6C Receiver (mostly included).

Turnigy Evolution

TGY-iA6C Receiver

Fly SKY FS-iA10B Receiver

The AIO Sketch:

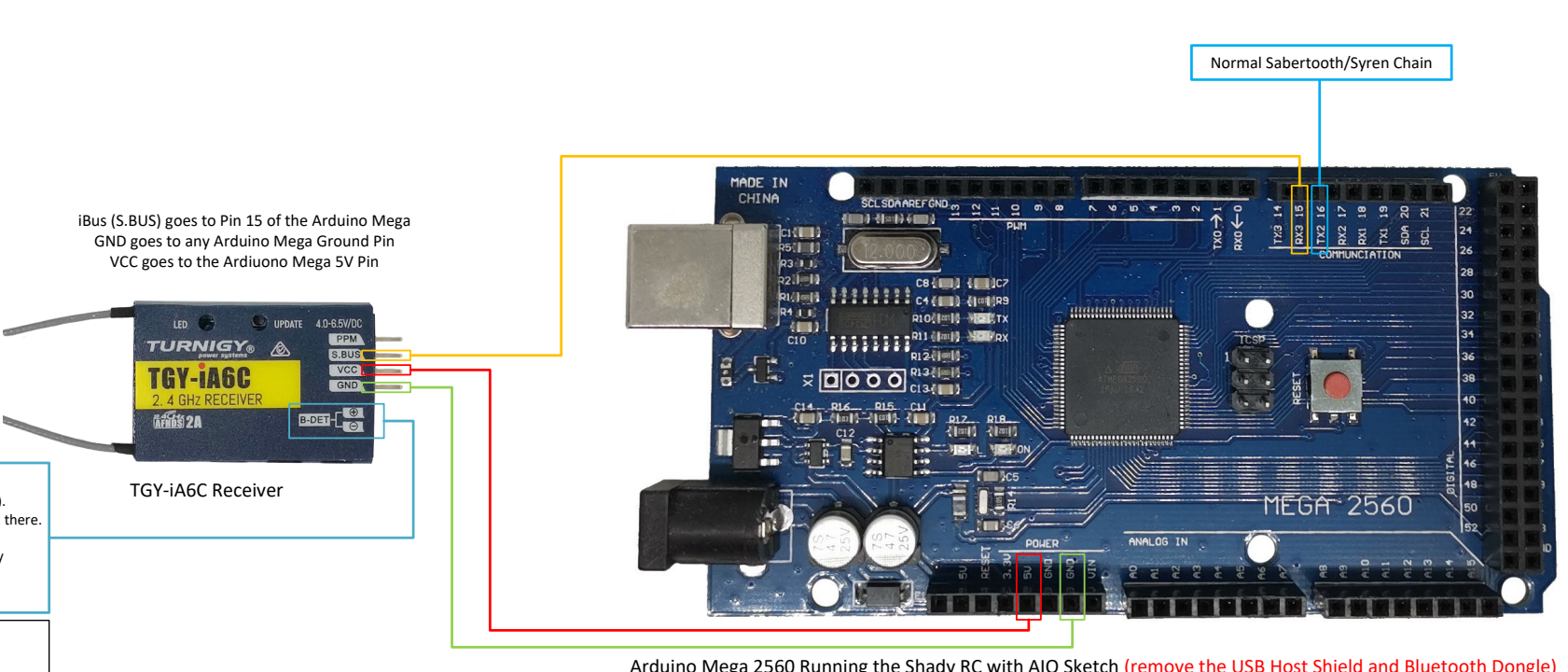
The Standard Sketch should run fine with some modifications:

Disconnect the Line between the Arduino Mega 2569 (Body) and the Dome Master Marcduino (and Body Master)
Which means the Body Marcduino is obsolete from now on, but there's another solution to trigger him (i'm working on it!)

The USB Shield and Bluetooth Dongle is also not needed!

You can also trigger the MP3s from the Turnigy Evolution. Please read the Astromech Wiki entry:

https://astromech.net/droidwiki/Shady_RC_dEvolution


Normal Sabertooth/Syren Chain

iBus (S.BUS) goes to Pin 15 of the Arduino Mega
GND goes to any Arduino Mega Ground Pin
VCC goes to the Ardiuono Mega 5V Pin

TGY-iA6C Receiver

Arduino Mega 2560 Running the Shady RC with AIO Sketch (remove the USB Host Shield and Bluetooth Dongle)

The Sketch says:
On the TGY-iA6C receiver there is a little 2-pin JST port labeled B-DET (i guess battery detection).
You can connect your main battery here and it's voltage will be sent to the transmitter and displayed there.
However, the B-DET is limited to 4S battery (16.8V) input.
If you're using a 6S battery (25.2V), it would damage the receiver, so I connect my main battery using a simple voltage divider using two 10K resistors.
Then I tell the Evolution Transmitter to pretend that we've got a 3S battery instead.

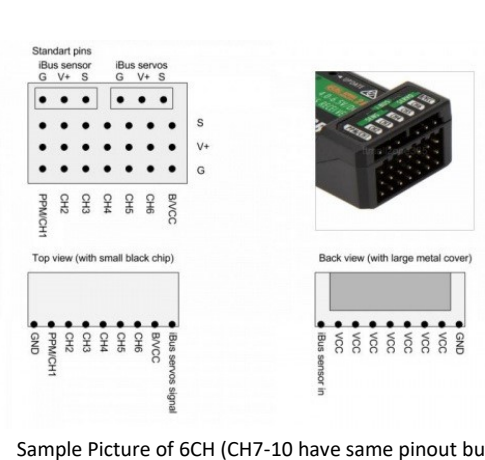
Right Stick Ch.1 = Steering
Right Stick Ch.2 = Throttle
Left Stick Ch.3 = Autodome frequency, or Volume (when knob VrA is fully clockwise)
Left Stick Ch.4 = Dome Rotation
SwB (left) Ch.5 = Set Max Drive Speed *** Factory default for Ch.5 is both SwB & SwC)
SwA (mid) Ch.6 = Foot Drive Enable (up=off, down=on)
VrA (knob) Ch.7 = sound/function selector
SwC (right) Ch.8 = Trigger Sounds *** Factory default for Ch.8 is disabled!

The MD Sketch:

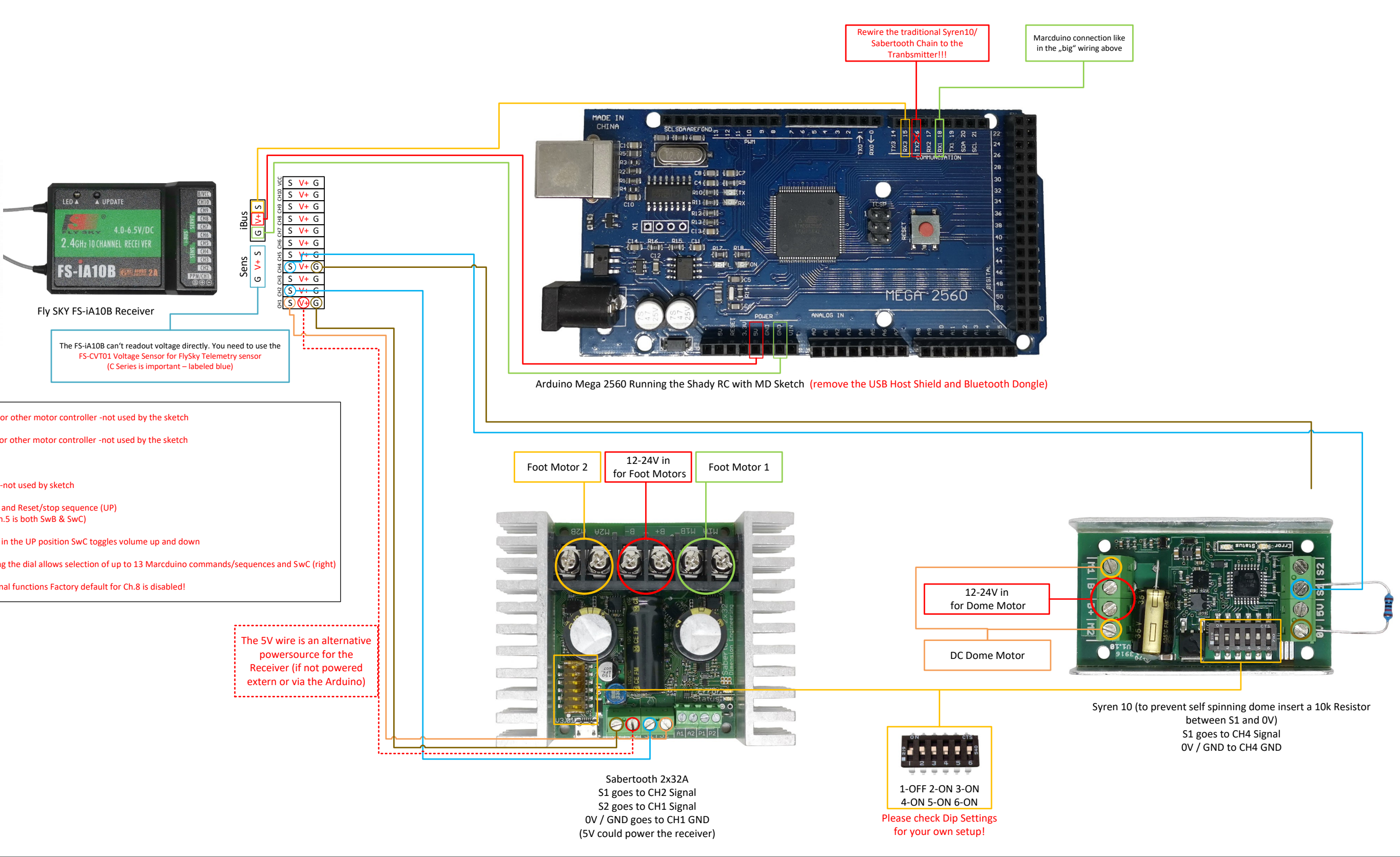
The Marcduino Sketch is different.
Currently iBus triggers only Ch. 5-8
The Syren 10 and Sabertooth are directly connected to the classic servo outputs
Via CH1, Ch2 & Ch4 (Ch3 is currently unused)
So the classic daisy chain for them must be disconnected and rewired to the receiver.
The USB Shield and Bluetooth Dongle is also not needed!

More information on the Astromech Wiki:

https://astromech.net/droidwiki/Shady_RC_dEvolution


Standart pins
iBus sensor
iBus servos
Top view (with small black chip)
Back view (with large metal cover)

Sample Picture of 6CH (CH7-10 have same pinout but aren't needed)



Rewire the traditional Syren10/ Sabertooth Chain to the Tranbsmitter!!!

Marcduino connection like in the „big" wiring above

Fly SKY FS-iA10B Receiver

The FS-iA10B can't readout voltage directly. You need to use the FS-CVT01 Voltage Sensor for FlySky Telemetry sensor (C Series is important – labeled blue)

Arduino Mega 2560 Running the Shady RC with MD Sketch (remove the USB Host Shield and Bluetooth Dongle)

Right Stick Ch.1 = Steering wired directly to Sabertooth or other motor controller -not used by the sketch
Right Stick Ch.2 = Throttle wired directly to Sabertooth or other motor controller -not used by the sketch
Left Stick Ch.3 = Not currently used
Left Stick Ch.4 = Dome Rotation wired directly to Syren -not used by sketch
SwB (left) Ch.5 = MarcDuino Command execute (down) and Reset/stop sequence (UP)
Middle switch position is stand by Factory default for Ch.5 is both SwB & SwC)
SwA (mid) Ch.6 = Channel 8 sound toggle. When SwA is in the UP position SwC toggles volume up and down
VrA (knob) Ch.7 = MarcDuino Command selector Turning the dial allows selection of up to 13 Marcduino commands/sequences and SwC (right)
Ch.8 = Custom Function Trigger. Used to trigger additional functions Factory default for Ch.8 is disabled!

The 5V wire is an alternative powersource for the Receiver (if not powered extern or via the Arduino)

Sabertooth 2x32A
S1 goes to CH2 Signal
S2 goes to CH1 Signal
0V / GND goes to CH1 GND
(5V could power the receiver)

1-OFF 2-ON 3-ON
4-ON 5-ON 6-ON
Please check Dip Settings for your own setup!

Syren 10 (to prevent self spinning dome insert a 10k Resistor between S1 and 0V)
S1 goes to CH4 Signal
0V / GND to CH4 GND