1

2

3

4

1

2

3

4

1

2

3

4

Speaker

Audio Right

Audio Left

Eye LEDs

Head Nod Servo

HS-7954SH

Head Nod Servo Cntrl

Gnd

6V

1

2

3

4

Head Rotate Servo

HS-7954SH

Gnd

6V

Gnd (LEDs and Audio)

Back Air Cylinder (Up/Down)

Back Cntrl

(black wire)

Short - Back up   
Open - Back down

12V

(red wire)

**4**

**3**

**1**

**2**

Head Rotate Servo Cntrl

1

2

3

4

Mouth Servo

HS5245MG

Mouth Servo Cntrl

Gnd

6V

**5**

Two 7-wire Sprinkler cables used from the controller to the Prop (18 gauge wire can handle 16 amps max). . Although any pin of the connectors can handle at most 8 amps. 6V power supplies supply max 3 amps per. supply, Air cylinder valve draws at most 2.5/12 = 0.21 amps but requires circuitry as shown below to drive the Air cylinder relay to reduce flyback problems (non turn off). LEDs draw maybe 20 milliamps combined with 500 ohm resistor in series

E

B

C

Air Cylinder Relay Red wire

Digital Relay Cntrl In

Arduino Mega Pin 23 (PA1)

12 V

Air Cylinder Relay

Air Cylinder Relay Black wire

+5V - Relay on

0V - Relay off

1K ohm (or maybe 500 ohm) resistor? Verify what resistor value we need?

Arduino Mega pin 22 (PA0)

Eye LEDs

Head Rotate Servo Cntrl 🡪 Arduino Mega pin 11 (PWM PB5)

Head Nod Servo Cntrl 🡪 Arduino Mega pin 12 (PWM PB6)

Mouth Servo Cntrl🡪 Arduino Mega pin 13 (PWM PB7)

Eye LEDs 🡪 See circuit above

MDFLY MP3 (AU5120/5121)Audio Player pins:

Pin 15 (RXD serial in) 🡪 Arduino pin 14 (TXD3 out serial pin)

pin 17 Right Audio Out -🡪 thru 1.8K ohm resistor to Prop Right Audio In (Disconnected when using Electret Mic to drive prop audio)  
pin 18 Left Audio Out -🡪 thru 1.8K ohm resistor to Prop Left Audio In (Disconnected when using Electret Mic to drive prop audio)

Pin 19 GND (RTN)

Pin 20 VCC 🡪 12volts

Electret Microphone Amplifier - MAX9814 with Auto Gain Control (Adafruit ADA1713):

Pin Gnd -🡪 Gnd

Pin Vdd 🡪 5VArduino

Pin Gain 🡪 5V Arduino (sets gain to 40dB)

Pin Out 🡪 thru 1.8K ohm resistor to Prop Right/Left Audio In (Disconnected when using MDFLY MD3 player to drive prop audio)  
Pin AR - NC

Adafruit BNO055 Absolute Orientation Sensor (one sensor is used on Head, one on Mouth)

Vin 🡪 5V Arduino

3VO 🡪 NC

Gnd 🡪 Gnd Arduino

SCL 🡪 Arduino pin 21 (SCL)

SDA 🡪 Arduino pin 20 (SDA)

RST 🡪 NC

INT 🡪 NC

ADR 🡪 3V Arduino for Head BNo055 for 0x29 I2C ID, Open for Mouth BNO055 0x28 ID

PSO, PS1 🡪 NC