



Pegase (DuiMot)

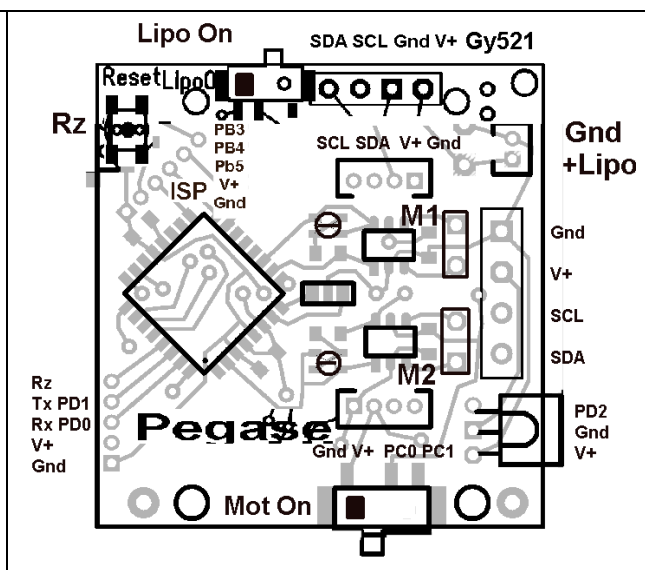
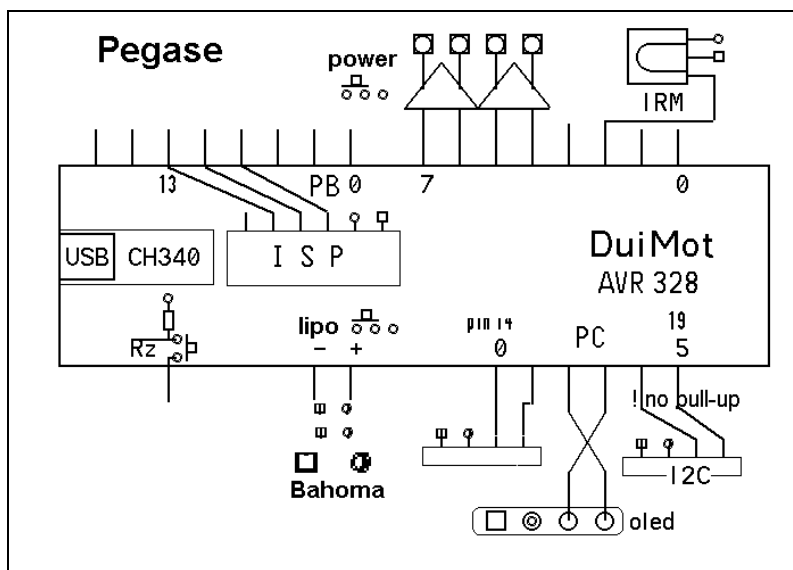
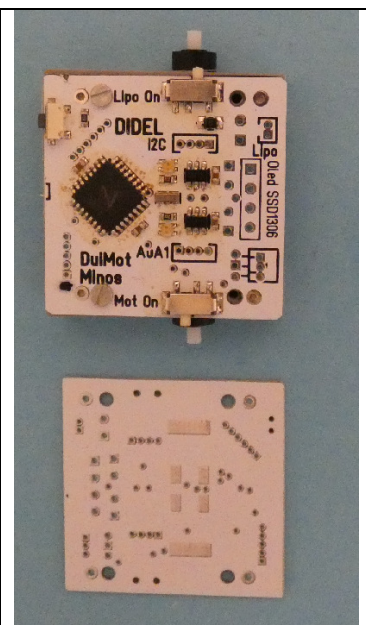
Pegasus served as a mount for several heroes to perform their exploits

That small board is indeed an Arduino compatible board with a built-in motor shield. Use it to build a small robot or any application that need 2 motors, servos, sensors. The 6 A0-A5 Arduino pins are easy to access. One of the 3 connectors is compatible with an Oled display, 128x64 or 128x32. The two other connectors are one for 2 analogue channels or 2 servos, and one for I2C (no pull-up, can be used for other applications). Serial lines and SPI are on 1.27mm pitch set of holes.

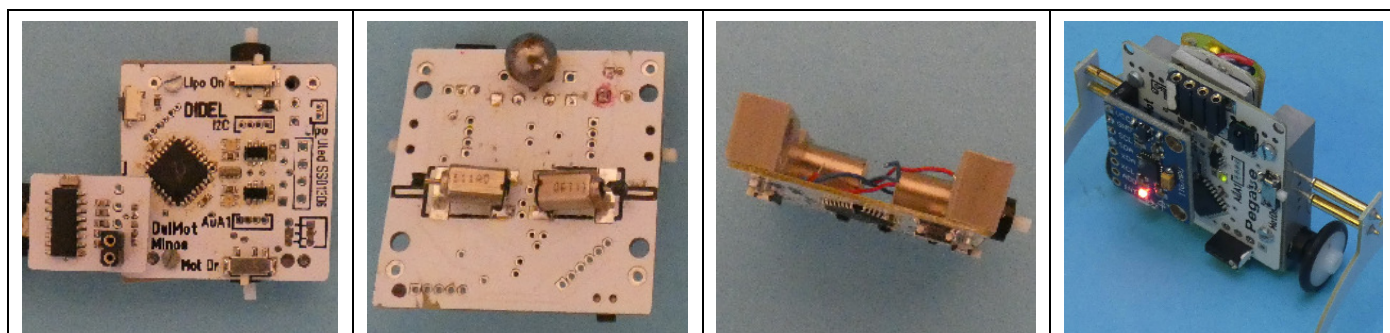
Board size is 30x30mm size, motor connectors are 2.54mm pitch, max 500 mA peak. Extension connectors use 1.27mm Molex connectors with easy harness; you never need to do small solders.

Easy to solder on bottom side: two vibrating robots and you get a funny bristle bot you can IR control Or without the mass and a good inclination, a direct drive robot like a Bimo or a Turtle.

The cute application is a micro self-balancing robot. Your challenge!



Pegase includes an AVR328, a programming connector toward a Gaia/DuiLoad USB adapter, two CS7721 bidirectional motor drivers (max 0.4A) and an IR receiver circuit. The AVR328 is loaded with the Duemilanove boot loader. See the definition file and start programming, it is just an Arduino. For autonomous applications, add any LiPo. A Molex 2-pin connector can be soldered for a drone replacement LiPo. A 2-pin, 2.54mm pitch connector can be added for other LiPos. The Pegase also has Bahoma magnets for easy magnetic connect/disconnect



S Affectionation of the AVR328 signals					
Pin	Port		Pin	Port	
0	PD0	Rx	10	PB2	nc
1	PD1	Tx id	11	PB3	PbConn
2	PD2	IrModule	12	PB4	PbConn
3	PD3	nc	13	PB5	PbConn
4	PD4	RecG	14	PC0	PcConn
5	PD5	AvG	15	PC1	PcConn
6	PD6	AvD	16	PC2	Oled SCL
7	PD7	RecG	17	PC3	Oled SDA
8	PB0	nc	18	PC4	SCL
9	PB1	nc	19	PC5	SDA

```

//#include Pegasee.h C
#define bIrm 2 //PortD
#define bIrmOn (PORTD & (1<<bIrm))
// Moteurs
#define bAvL 5
#define bRecL 4
#define AvL bitSet (PORTD,bAvL); bitClear (PORTD,bRecL);
#define RecL bitClear (PORTD,bAvL); bitSet (PORTD,bRecL);
#define FreeL bitClear (PORTD,bAvL); bitClear (PORTD,bRecL);
#define StopL bitSet (PORTD,bAvL); bitSet (PORTD,bRecL);
#define bAvR 6
#define bRecR 7
#define AvR bitSet (PORTD,bAvR); bitClear (PORTD,bRecR);
#define RecR bitClear (PORTD,bAvR); bitSet (PORTD,bRecR);
#define FreeR bitClear (PORTD,bAvR); bitClear (PORTD,bRecR);
#define StopR bitSet (PORTD,bAvR); bitSet (PORTD,bRecR);

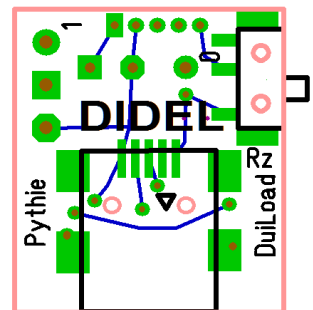
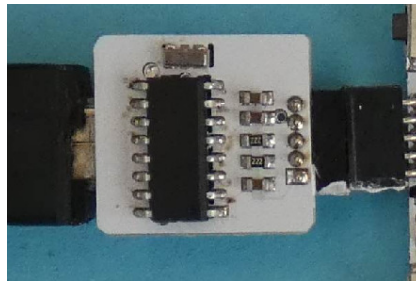
void SetupDuiMot (){
  DDRB = 0x00; // according to connector
  DDRC = 0x00;
  DDRD = 0xF0; //Motors, IRM in
}

```

Definition file and test programs available on www.didel.com/Pegase.zip -- not yet, ask

USB programming

Like for the Arduino Micro, the USB to serial adapter is on a DuiLoad board named Gaia for simple transfers. Pythie and Janus boards help for debugging.



Motors

Use this simple program to test the wiring of your motors. It defines a forward movement:

```
digitalWrite (bRecL,LOW); analogWrite (bAvL,20); delay (1000);
digitalWrite (bRecR,LOW); analogWrite (AVR,20); delay (1000);
```

Remove one line to see what is left and right

The bicolor leds are green for forward movement. Correct the motor direction if not correctly soldered or use your own definition file.

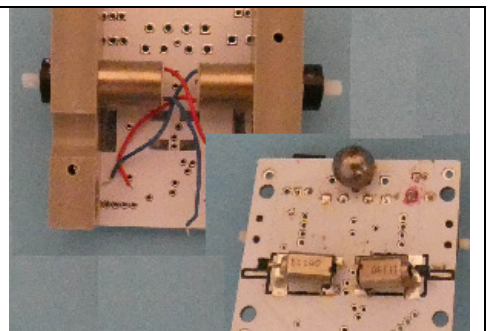
As most motor shields, pins 4,5,6,7 control the motor, with PWM on pin 5 and 6.

The drivers are CS7721 well suited for 200mA small and "solar" motors (10-30 Ohm coils). Blocking mode is with both inputs at logic "1".

Doing bidirectional PWM on these pins is explained on https://playground.bxotec.ch/doku.php/motor/bidirectional_motorcontrol_arduino

Remember PFM allows for a better speed control:

<https://www.didel.com/PFMversusPWMforRobots.pdf>



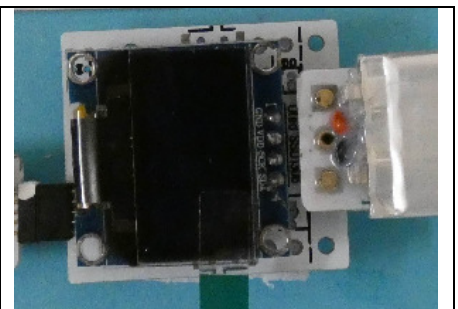
I2C connector for SSD1306

The Oled SSD 1306, 32x128 or 64x128 are so cheap and so easy to use, why do without it ? Oled can be set parallel or perpendicular to the board.

The Sda Scl lines are on PC2, PC3 and access is made with Didel bitbang lib, making the Arduino I2C lines free for I2C sensors or displays.

Our doc is includes many files, easy to click on if you load first

<https://www.didel.com/Oled.html>

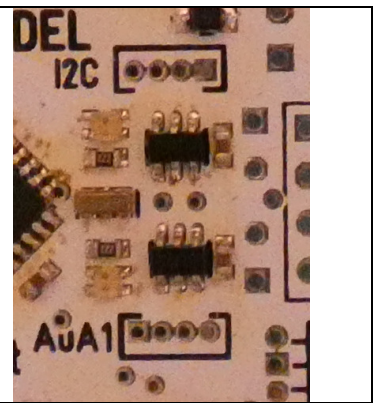


I2C connector for sensors (Molex 4 pins)

Arduino Pins 18/A4/SDA and 19/A5/SCL are available on a Molex Picoblade 1.27mm pitch connector.
Add 4k I2C pull-ups on your I2C board if not already included.

Analogue of logic signals (Molex 4 pins)

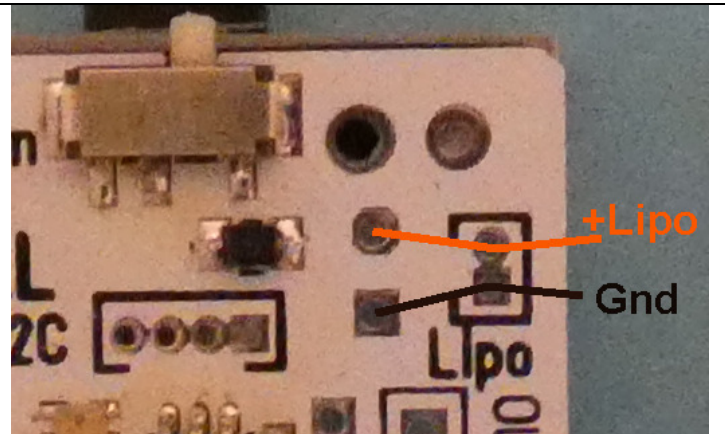
Arduino Pins 14(A0) and 15(A1) are available on a second Molex Picoblade connector



Lipo connection

A 2.54mm and a 1.25mm connectors can be soldered. The LiPos can stay connected while reprogramming, having the 5V USB on the board.

It would be fine to use the LiPos available as spare parts for mini drones and helicopters,
But connectors are voluminous and of different makes, LiPo wires are strong and too long for our applications. 70 to 100 mAh are small, easy to maintain, and they last more than 1h.our

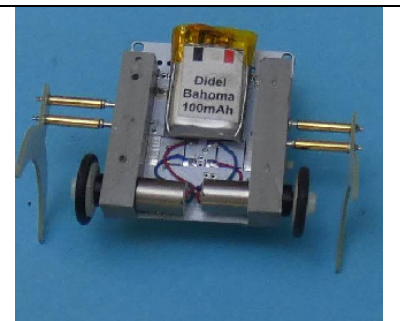
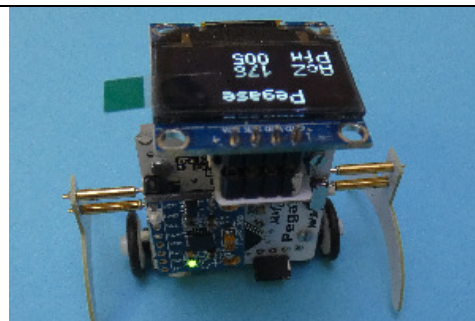
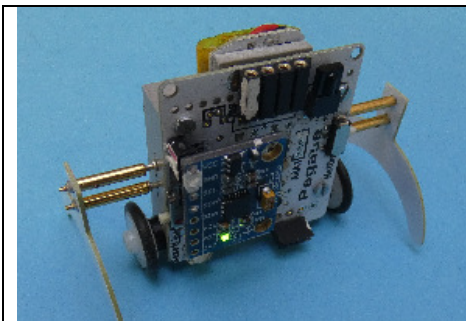


Bahoma2 Lipos

With Bahoma, no problem with painful to insert connectors, no long wires. 100mAh Lipos fit and provides 1 hour of operation. Replace the Lipo in a snap, reload it on the USB charger with Bahoma magnets.

Project: Balancing robot

The **Pegase** design is suitable to build a program an impressively small balancing robot. The GM06-25 gear motors with a wheel of 12mm are fast and responsive. I2C connector is here to connect one of the many accelerometers that exist. Select a circuit that works from 5V till 3.3V, so you switch from development with 5V USB to LiPo supply. A 3.3V device will require an I2C adapter (Didel Adal2C ou any small size adapter).



Other projects: vibrating robot, "bimo" robot. The PCB allows to solder below the circuit, 2 4mm pager motors. With inclined motors the extremity of the motor, on which 1mm rubber tube is inserted.

