



Pan & Tilt Servo bracket controlled by Arduino

by [markie](#) on August 21, 2012

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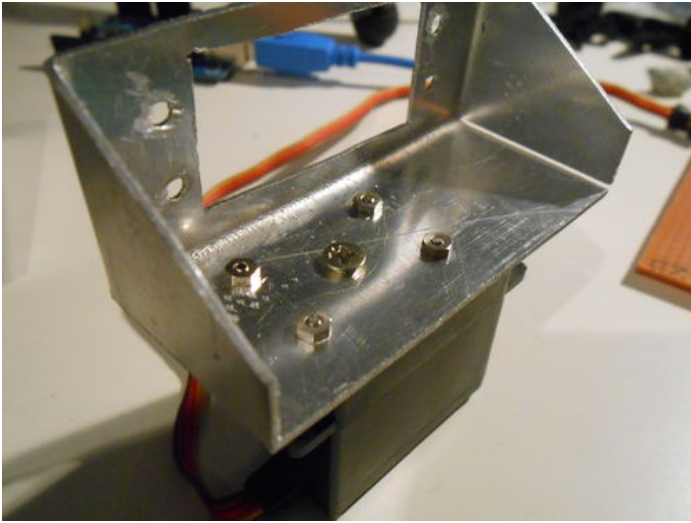
Intro: Pan & Tilt Servo bracket controlled by Arduino

Hi, in this instructable i am showing you how to build a very nice and very sturdy pan & tilt turret for your rc / arduino projects.

(Please don't judge my english grammer etc. i'm from holland)

The things that you need for this project are **not** expensive or hard to find so it should be easy to build.

You **don't** need expensive tools or anything to build this, just use your imagination and some handy hands :D



Step 1: Materials

The materials and tools that you're going to need.

Materials:

- Arduino Uno (**or other**)
- example code (**included**)
- 7 wires
- breadboard
- camera tripod (**i used a small one**)
- aluminum plate (**1mm thick**)
- 4 miniature nuts and screws
- 8 (**3x10mm**) allen screws and 8 nuts
- 1 servo horn **at least with 4 holes**
- 1 big nut for the tripod (**i got this from an old camera**)

Tools:

- miniature jigsaw
- ruler
- pencil
- the design of your brackets (**included**)
- sandpaper
- drill
- screwdriver
- vice (**for bending**)

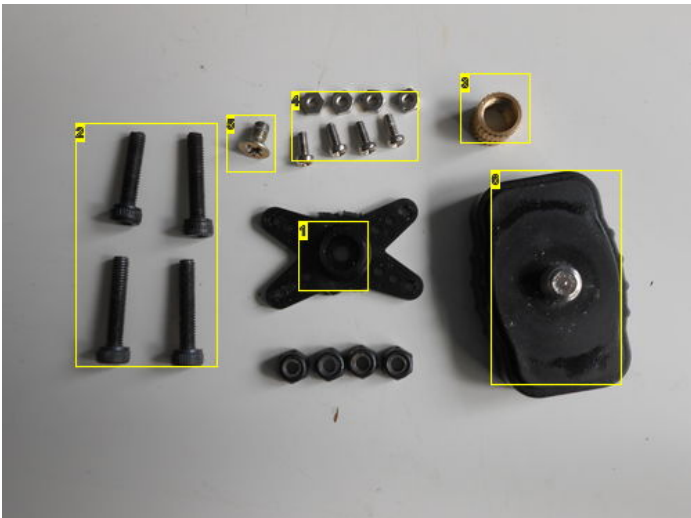


Image Notes

1. servo horn

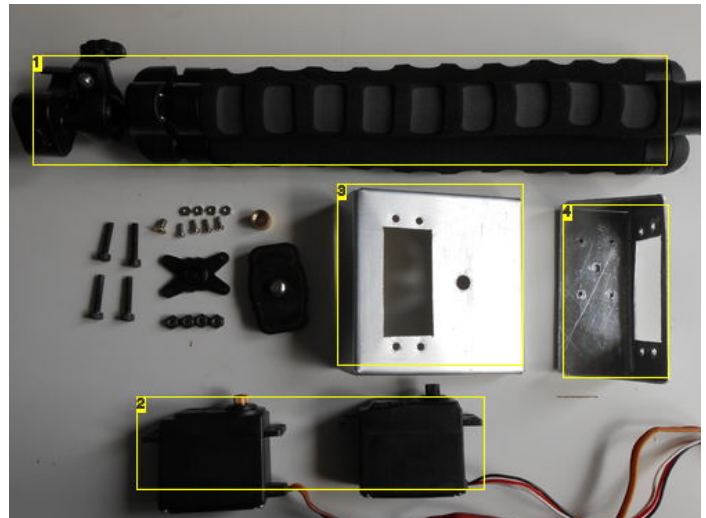


Image Notes

1. my bipod :)

2. allen screws
3. bipod mounting screw
4. miniature nuts and screws
5. servo horn mounting screw
6. detachable camera mount

2. servo's
3. this is the main bracket
4. this is the top bracket

Step 2: Design

First you need to draw the design on the aluminum.

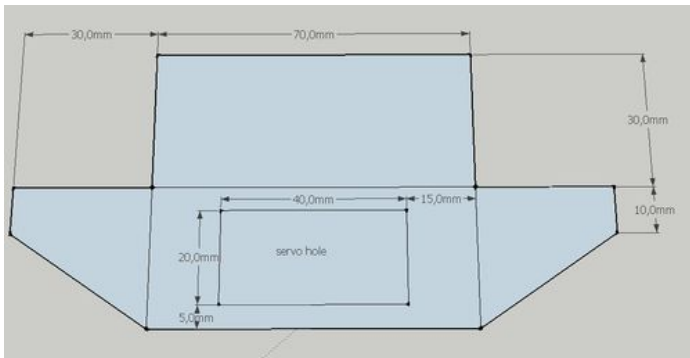
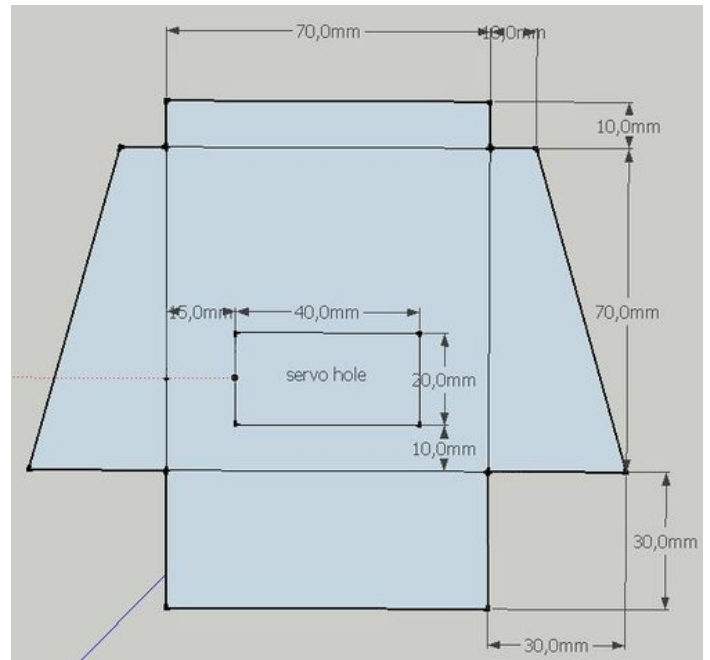
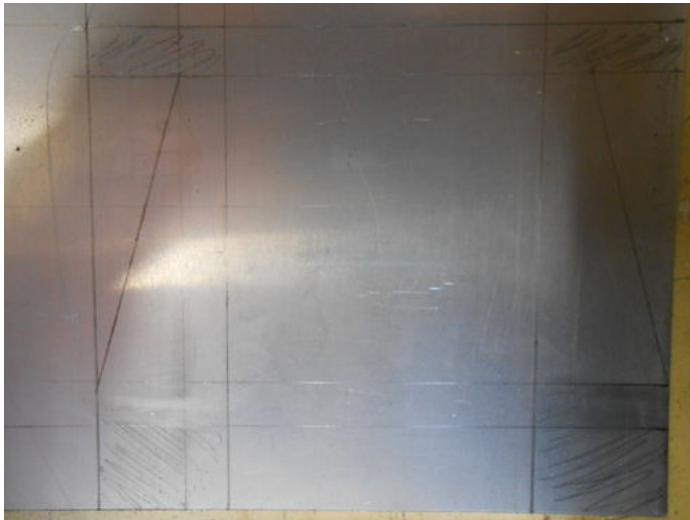


Image Notes

1. drill holes for the jigsaw. in this way you can easily saw every way.



Step 3: Jigsaw

Now you need to saw the design out of the aluminum very carefully with the jigsaw. try to make the saw lines as smooth as possible so when it's done it looks really nice.

WARNING !!!

Mention that in the second picture there are no holes for the screws to mount the servo, i've done this because the dimensions of every servo are slightly different !

So you must figure that part out by yourself !

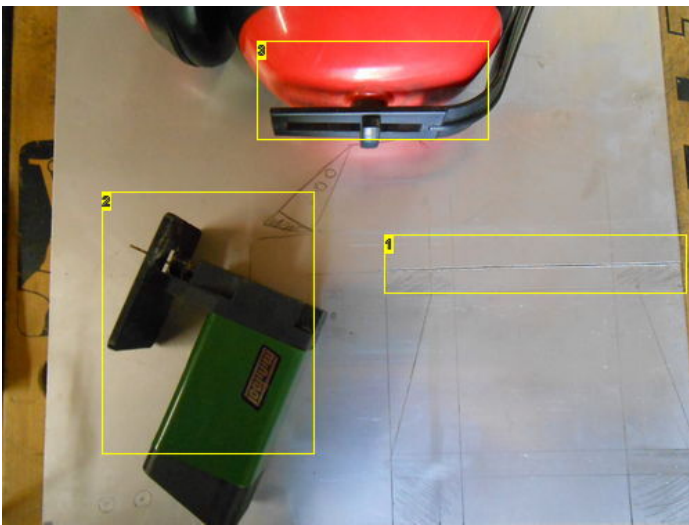


Image Notes

1. It's going trough aluminum like butter :D
2. I LOVE THIS Minitool !!
3. safety first!

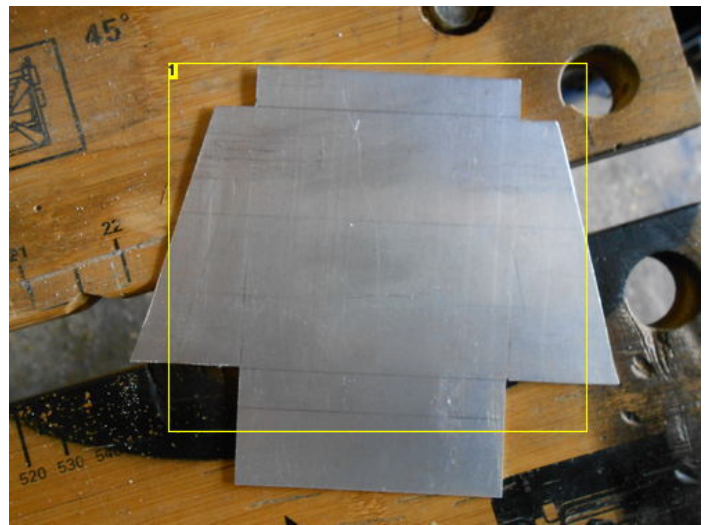


Image Notes

1. just like the design :)



Image Notes

1. drill holes for the jigsaw. in this way you can easily saw every way.

Step 4: Bending

Now you're already at step 4!

These are the thing you should have done already:

- draw the designs on the aluminum plate
- cut out the design with a jigsaw
- cut out the holes for the servo's
- drilled holes for the servo screws **(you must do this last 2 steps by yourself because the dimensions of every servo are different**

Step 4 includes bending the aluminum plates you've cut out in step 3.

For the bending i used a vise, just align the plate to the wide and bend it over **(SLOWLY)** with a piece of wood (plank)

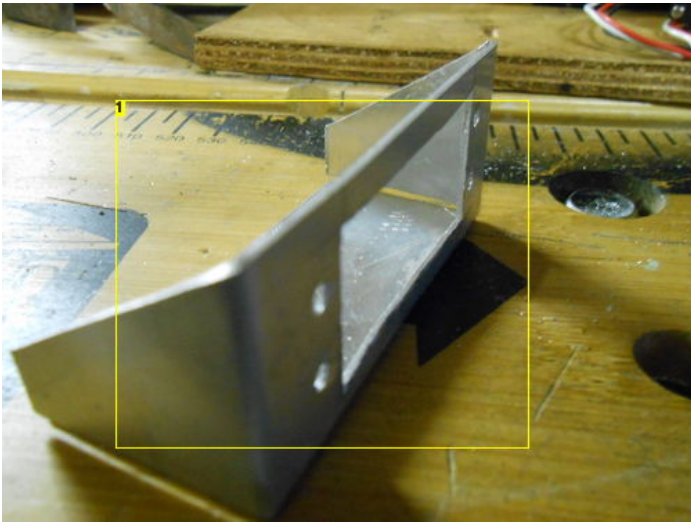


Image Notes

1. nice!

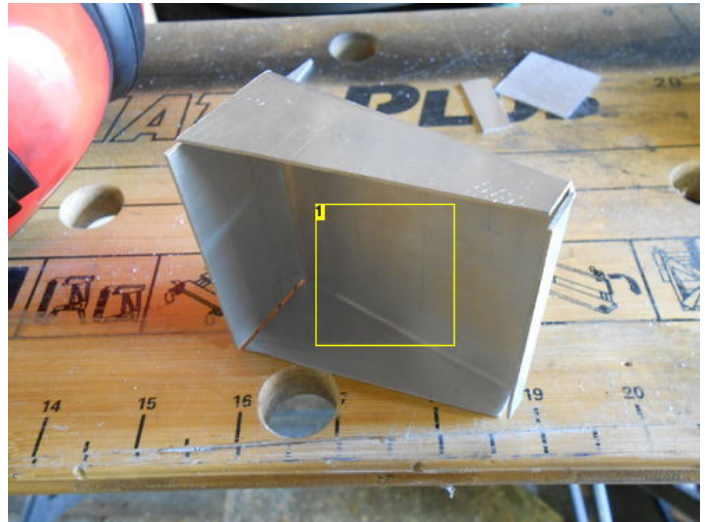


Image Notes

1. Forget to cut out the servo hole -.-"

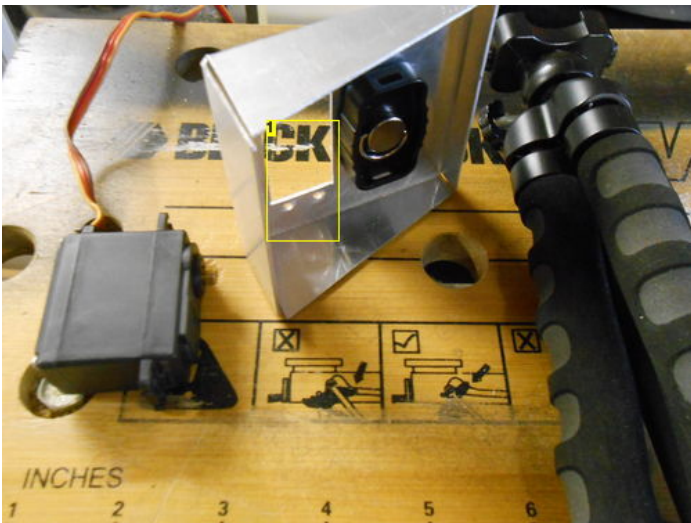


Image Notes

1. Done! plus the holes for the servo and mounting screw

Step 5: Assembling

These steps are all about assembling your pan & tilt bracket to your servo's.

1. mount the main bracket onto the tripod with the golden nut :)
2. mount the first servo underneath the main bracket with 4 screws
3. mount the servo horn underneath the TOP bracket with 4 miniature screws
4. mount the top bracket with the servo horn attached onto the first servo with a servo horn mounting screw
5. finally, mount the last servo onto the top bracket

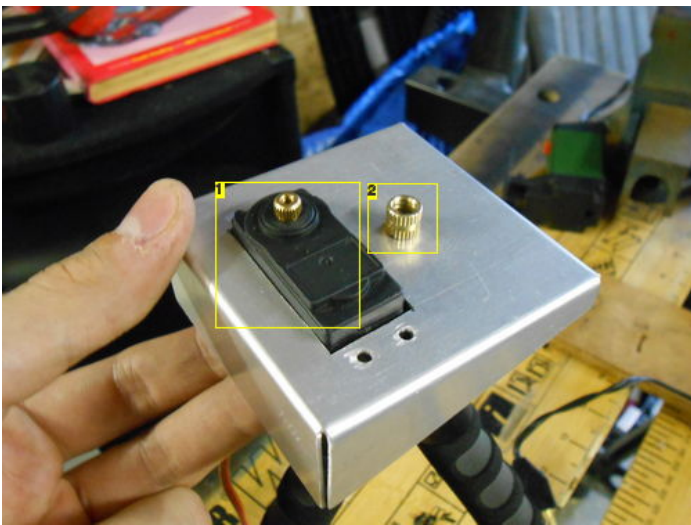


Image Notes

1. it sits really nice!
2. tripod mounting screw



Image Notes

1. screw the servo horn under the TOP bracket

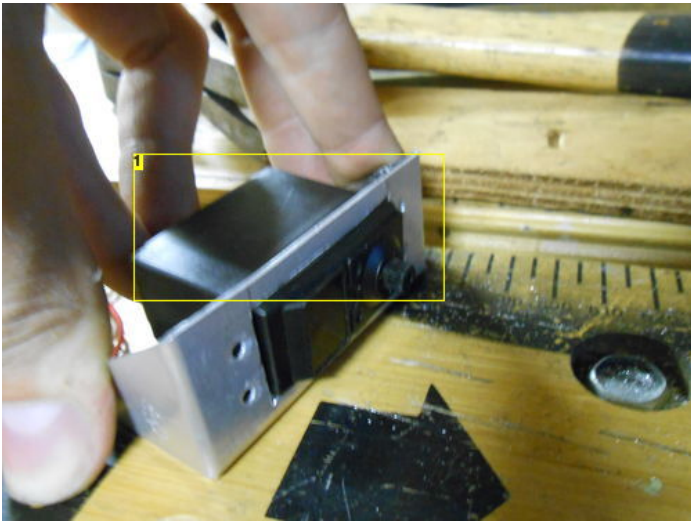


Image Notes

1. check if it fits properly

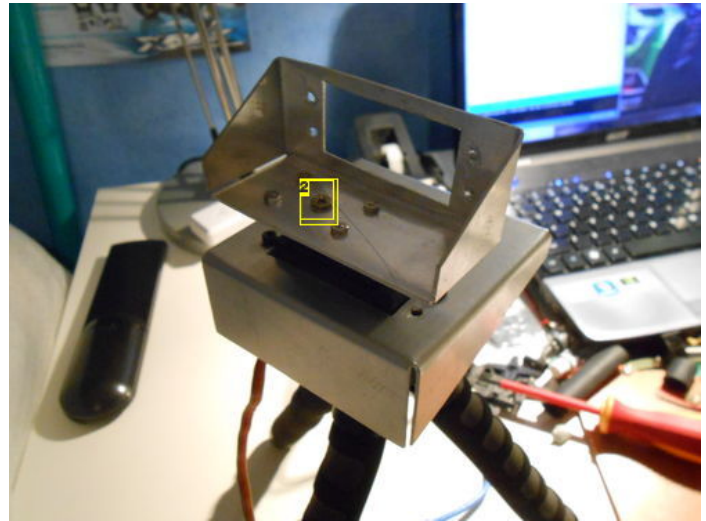


Image Notes

1. servo horn mounting screw (it goes through the aluminum plate into the servo !)
2. servo horn mounting screw goes trough the aluminum plate!

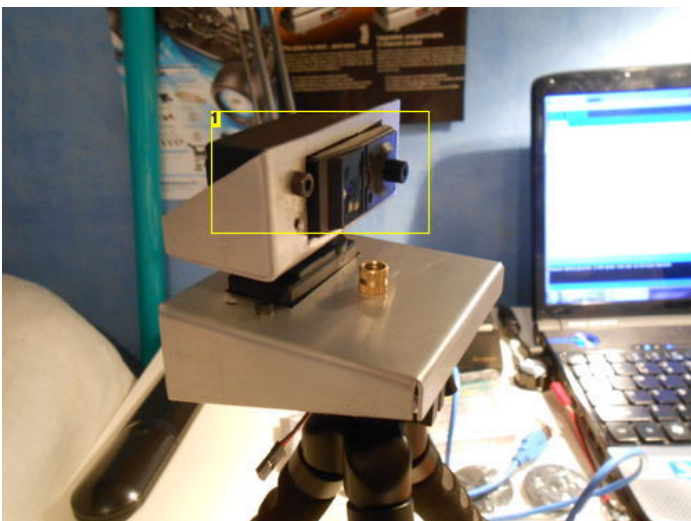


Image Notes

1. mount the other servo and you're turret is finished ! :D

Step 6: Arduino

In this step we will connect the arduino to the servo's and upload a test program.

for this step you will need:

- the arduino
- 7 wires (2 black, 2 red and 3 yellow)
- code (it's just the sweep library from arduino 1.01)

Wiring:

- connect the plus from the servo to the 5v on the arduino
- connect the ground from the servo to the ground on the arduino
- connect the signal (yellow) from the servo to pin 9 on the arduino

Code:

```
// Sweep
// by BARRAGAN <http://barraganstudio.com>
// This example code is in the public domain.

#include <Servo.h>

Servo myservo; // create servo object to control a servo
// a maximum of eight servo objects can be created

int pos = 0; // variable to store the servo position

void setup()
{
  myservo.attach(9); // attaches the servo on pin 9 to the servo object
}

void loop()
{
  for(pos = 0; pos < 180; pos += 1) // goes from 0 degrees to 180 degrees
  { // in steps of 1 degree
    myservo.write(pos); // tell servo to go to position in variable 'pos'
    delay(15); // waits 15ms for the servo to reach the position
  }
  for(pos = 180; pos >= 1; pos -= 1) // goes from 180 degrees to 0 degrees
  {
    myservo.write(pos); // tell servo to go to position in variable 'pos'
    delay(15); // waits 15ms for the servo to reach the position
  }
}
```

Now when you've connected everything to the arduino and uploaded the sweep libray your pan & til turret is finished ! :D

A video of my turret :)

-----Thank for reading this instructable and i hope this was helpfull for you ! -----
-----Have questions? leave a message behind.-----

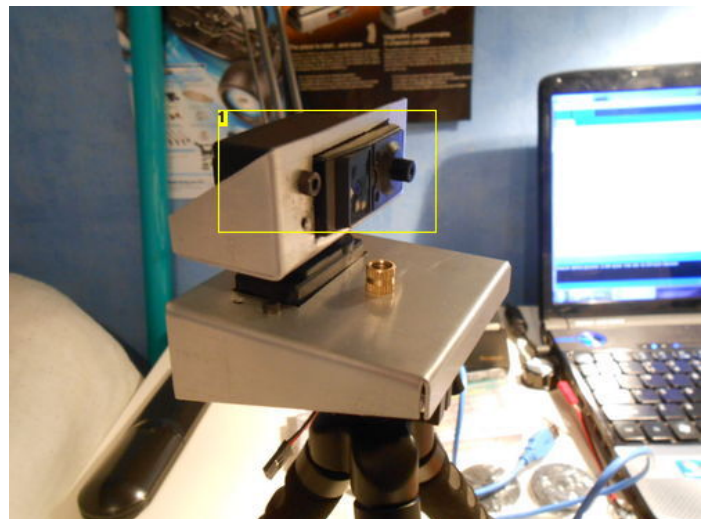


Image Notes

1. mount the other servo and you're turret is finished ! :D

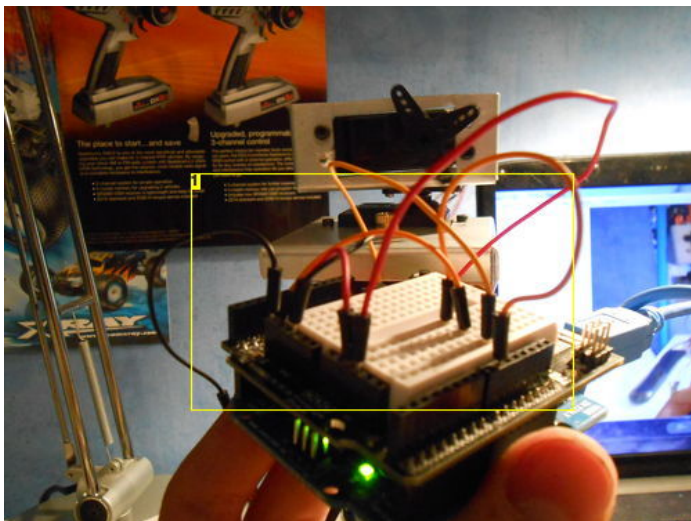
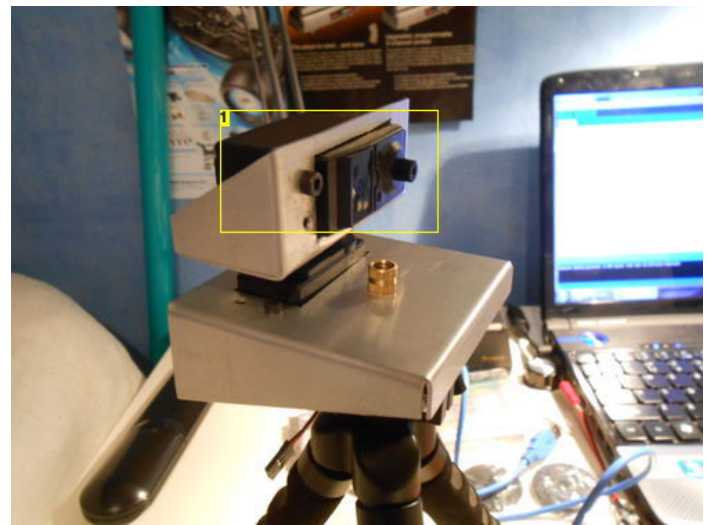
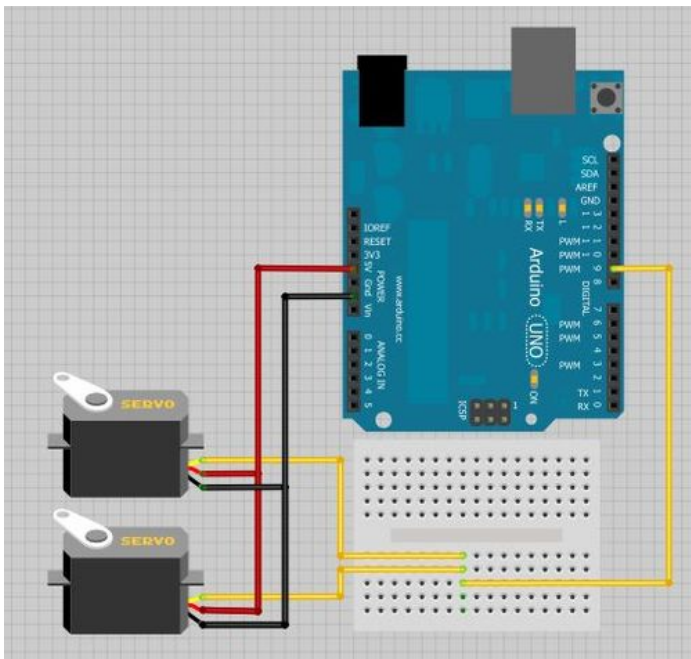


Image Notes
1. It works !! LOL :D

Related Instructables



Arduino Airsoft Turret by 12grahamb



Robotic Talking Turret by RazorConcepts



Autonomous Paintball Sentry Gun by sentryGun53



Remote controlled webcam using Arduino, SensorMonkey, jQuery and Justin.tv by amccoy6



Pan Tilt camera with Arduino and Joystick (Photos) by Federico Vendramin



Armed Tracked vehicle (video) by neal-dog

Comments

3 comments

[Add Comment](#)



amandaghassaei says:

nice project! Was there something special you built this to shoot?

Aug 21, 2012. 9:15 AM [REPLY](#)



markie says:

Thanks! and actually yes :) i'm working on a security system, there's going to be an instructable for that too. it involves the arduino, lcd, joystick, a paintballgun, some more aluminum, and i hope 2 xbee's too for making it al wireles :D

Aug 21, 2012. 9:25 AM [REPLY](#)



amandaghassaei says:

cool! tip on the xbee shield in case you're thinking of using it- both arduinos have to be running off batteries or the power jack to work, don't power them with the usb port, it screws up the communication. This frustrated me for a very long time once.

Aug 21, 2012. 9:31 AM [REPLY](#)