

4th April 2012

Romotive Hacked with Schematics

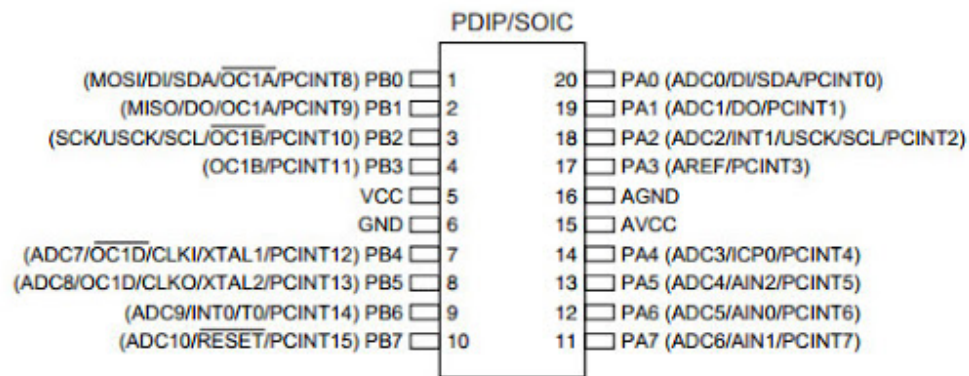
Yay- So my Romotive does not work... So lets hack it.

Specs

- [ATMEL - ATiny 861](http://www.atmel.com/Images/doc2588.pdf) [<http://www.atmel.com/Images/doc2588.pdf>] (SOIC)
- 20Mhz Crystal
- ~~56:1 Micro Geared Motors~~ 100:1 Motor From Pololu [<http://www.pololu.com/catalog/product/992>]
- R4558 [<http://www.kula.org.uk/public/romotive/datasheet/romotive-r4558.pdf>] Audio Amplifier (SOIC)
- 2nd Gen Audio Protocol [<http://romotive.com/blog/2012/04/hackers-welcomed-second-gen-protocol/>] (Posted by Romotive Blog)

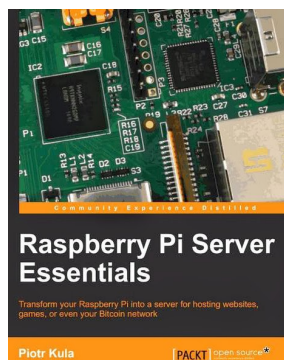
- ATiny861 Official Pin out

Figure 1-1. Pinout ATtiny261/461/861 and ATtiny261V/461V/861V



[<http://2.bp.blogspot.com/-czZa69uDyIg/T3oHGIPpswI/AAAAAAAdXI/lboAUiT2Rfw/s1600/attiny861-pinout.jpg>]

- Romotive PCB- Click for nice 8MP Macro shot.

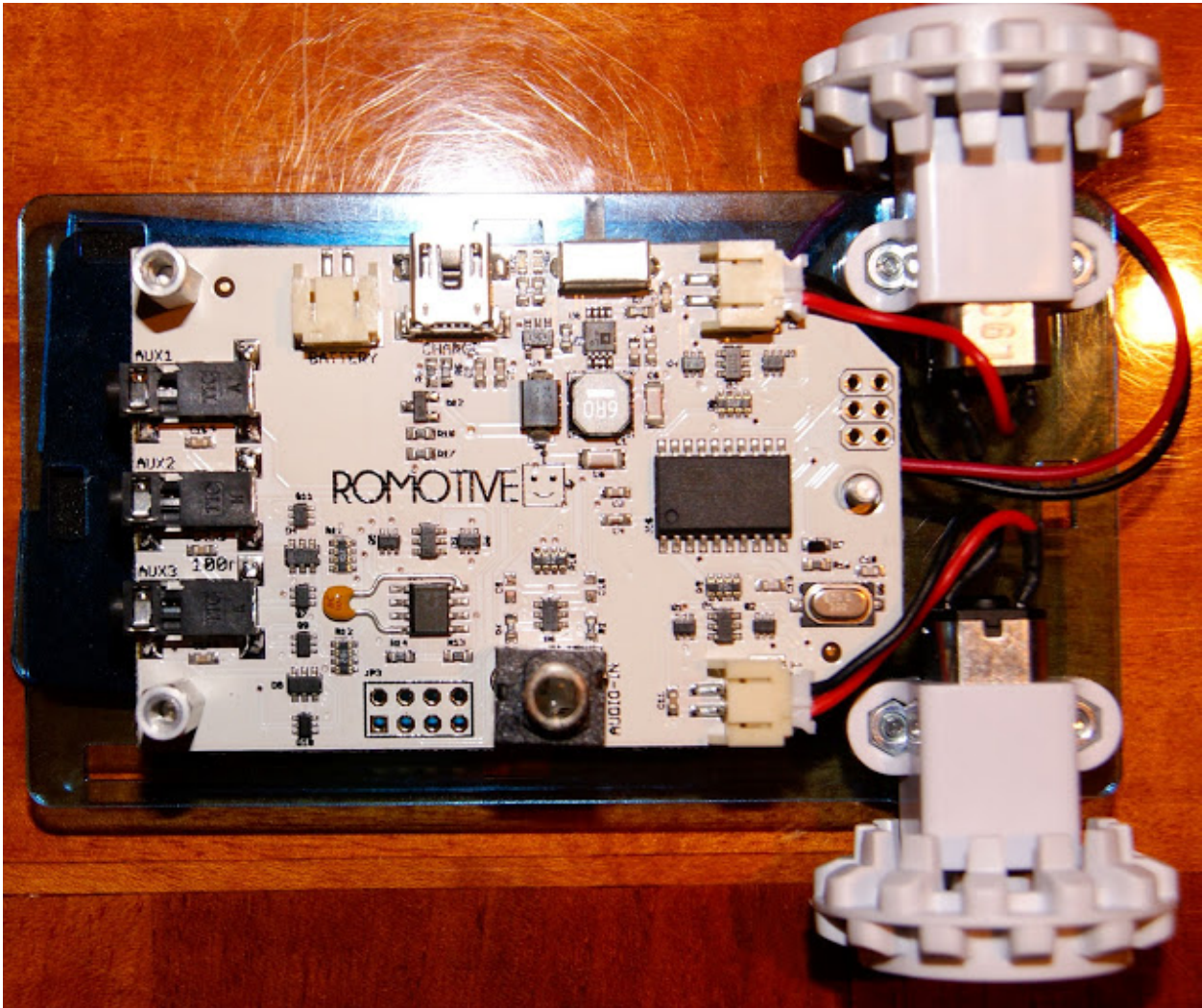


[<http://4.bp.blogspot.com/->

[Ps6EMrAYRnQ/UuGGszTeUcl/AAAAAAAh6Y/mV07lw0HqP0/s1600/raspberry-pi-server-essentials-cover.jpg](http://4.bp.blogspot.com/-Ps6EMrAYRnQ/UuGGszTeUcl/AAAAAAAh6Y/mV07lw0HqP0/s1600/raspberry-pi-server-essentials-cover.jpg)]

Buy Raspberry Pi Server Essentials [<http://raspberrypi-pkula.blogspot.co.uk/2014/01/raspberry-pi-server-essentials-my-book.html>] .

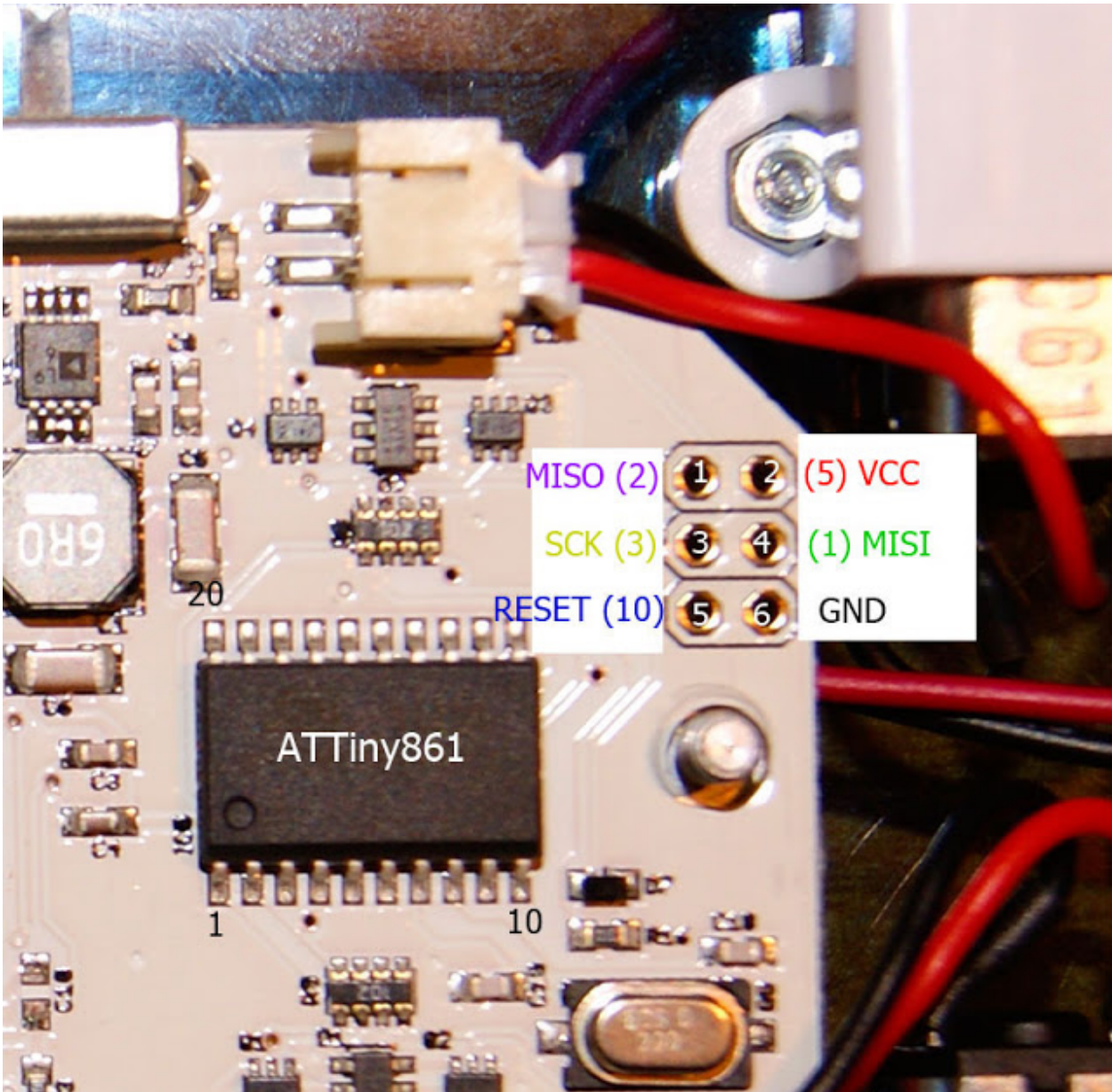
Problems with Romotive? Learn about
Raspberry Pi instead and make
your own robot!



[http://2.bp.blogspot.com/-9B2cR_v5t1c/T3n6iy7gWII/AAAAAAAAAdWw/vTcm1av7yx0/s1600/romotive-pcb.jpg]

Bottom Half 8MP @300mm Macro (5.5mb) Incredible CloseUp
[<http://www.kula.org.uk/public/romotive/pcb/Romotive-Blown-Up.jpg>]

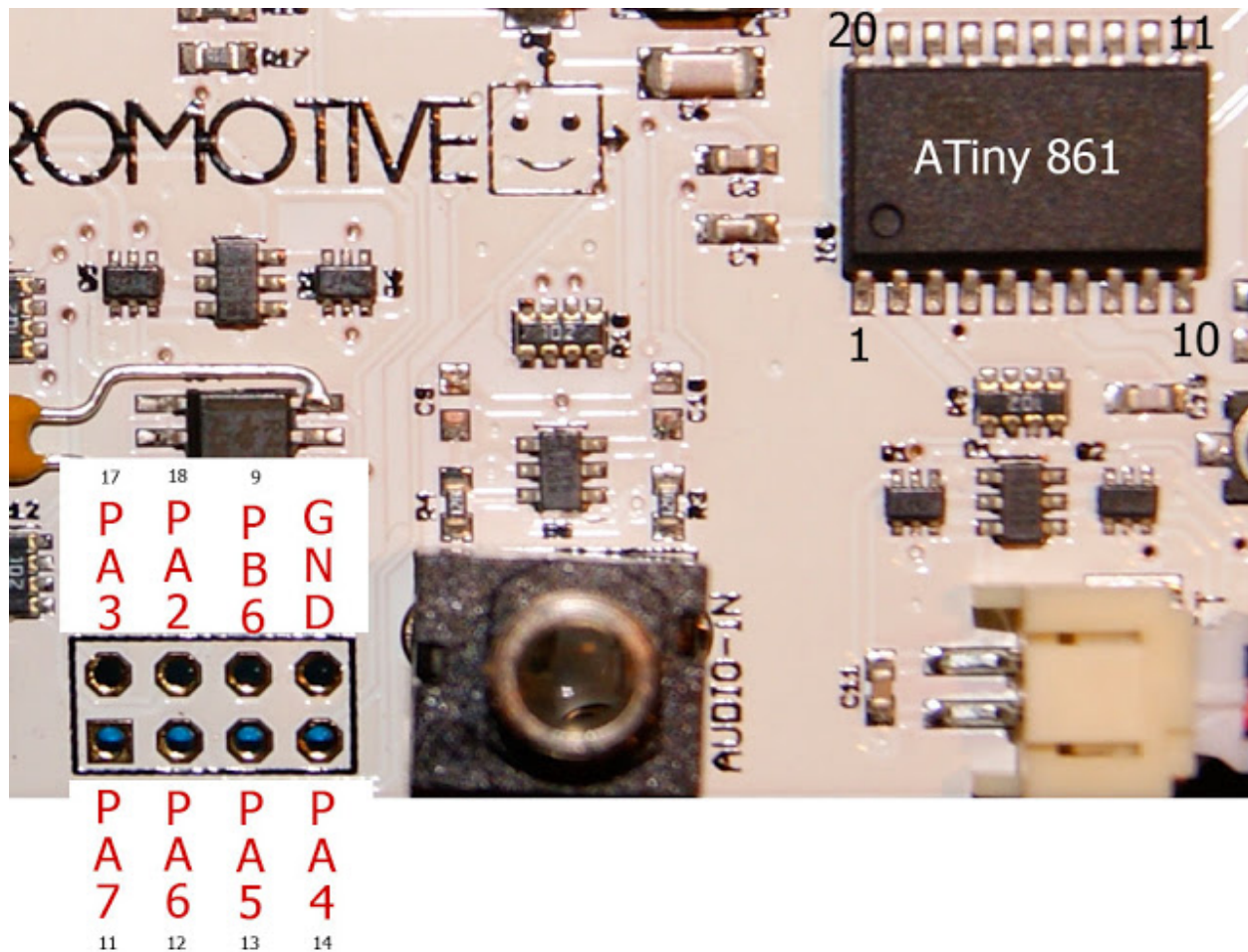
- Romotive Pin-out for Programming and Debugging



[http://4.bp.blogspot.com/-uDT9toEu_Lw/T3ocGrmSSVI/AAAAAAAAAdXg/UP2hM9_E7og/s1600/romotive-pinout.jpg]

Buy a programmer here, includes headers and tutorials [<http://goo.gl/WE8d6>]

- Romotive Extra Pins



[http://1.bp.blogspot.com/-D1lQbdk45hQ/T3oGPKUZVRI/AAAAAAAAAdXA/_slvww-WBIA/s1600/romotive-extra-pinout.jpg]

These pins make no sense to me yet. Especially that pins 20,19 the ones used for Serial Communication seem to be connected to ... nothing?

- **Motors**

Link to website [<http://robotmarketplace.com/products/0-GM11A.html>] <-- I thought these were the motors but they are actually 100:1- Still good link to have



[<http://4.bp.blogspot.com/-Xr0THuWVjKA/T3oPODjAwTI/AAAAAAAAAdXY/FFg7S9wMSOM/s1600/images.jpg>]

56:1 Micro Geared Motor (100-1 - the rest is the similar)
Part# 0-GM11A

Typical operating voltage 1.7-5.0VDC (tested upto 9v & 12v works fine apparently)

No load speed 480 rpm

No load current 300 mA

load current 550 mA +/- 30%

Starting torque 11.1 oz-in (800 g-cm)

True gear ratio 56.8:1

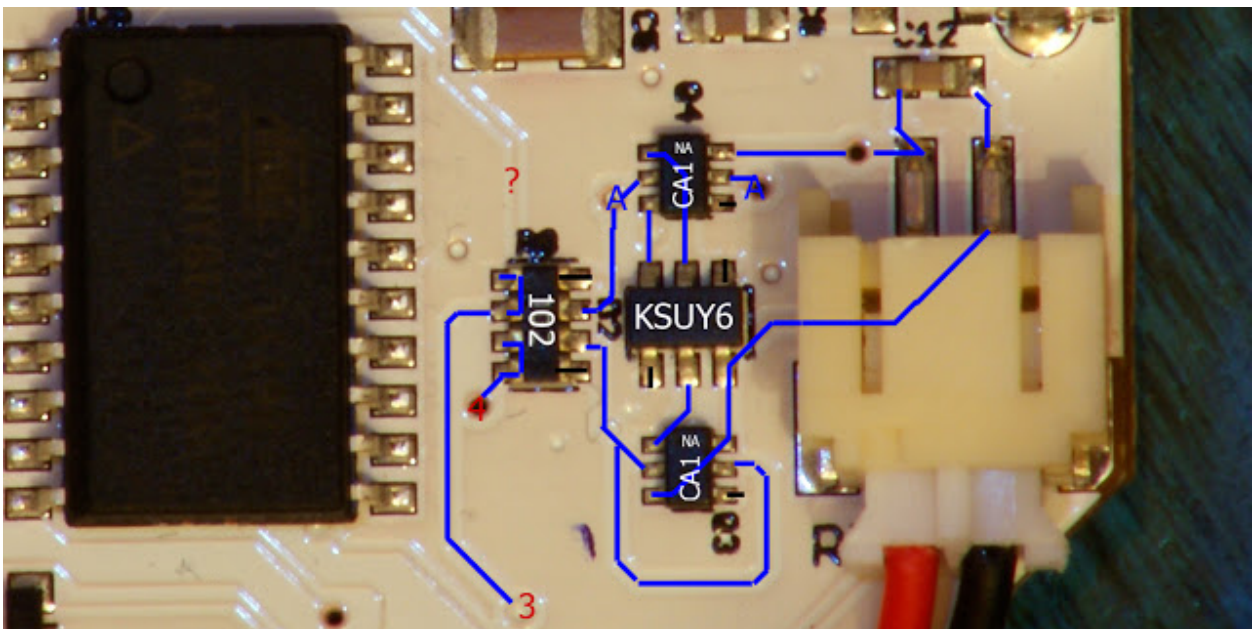
Shaft Size 3mm diameter. 7.4mm (.29") long

Size 0.47" x 0.39" x .94 (12mm x 10mm x 24mm)

Weight 7.8 grams (0.27 oz)

- **Motor Pin-outs**

Right Motor (Pins 3,4)



[<http://2.bp.blogspot.com/-xzGTvVdTwgk/T3ynjYIldKI/AAAAAAAAAdas/wa3hmRLBqpY/s1600/Romotive-Motor-PinOut.jpg>]

Left Motor (no pic) (Pins 1,2)

Bottom Half 8MP @300mm Macro 5.5mb

[<http://www.kula.org.uk/public/romotive/pcb/Romotive-Blown-Up.jpg>]

NB! Motor shares some of the same pins for programming the Atmel chip. I am not sure yet if the motors can stay connected while being flashed... Motors can stay connected and the Right motor will turn a bit while programming because it triggers the H-Bridge.

- **Audio Input**

It uses an amplification chip. R4558 [<http://www.kula.org.uk/public/romotive/datasheet/romotive-r4558.pdf>]

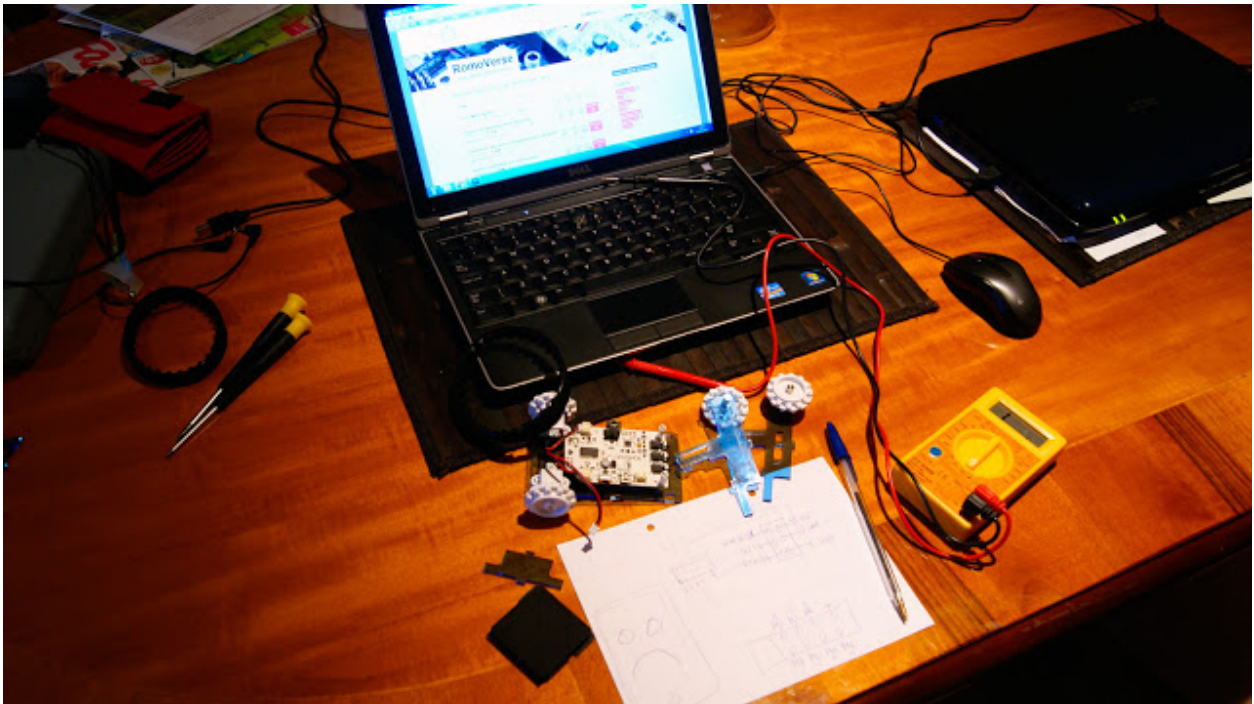
I am not interested in working out how this works- I have tried tracing how it connects but I cannot really make sense of

it yet.

- Other

Looks like [Electrical Engineering on Stack Exchange \[http://electronics.stackexchange.com/q/29283/4160\]](http://electronics.stackexchange.com/q/29283/4160) is giving a shot at reverse engineering Romo too :-)

Hey- Maybe they forgot to programme mine :-)



[\[http://3.bp.blogspot.com/-ltFNgWdJ5xg/T3oMoKBW4iI/AAAAAAAAAdXQ/Yf0Wgukuj_U/s1600/romo-is-ded.jpg\]](http://3.bp.blogspot.com/-ltFNgWdJ5xg/T3oMoKBW4iI/AAAAAAAAAdXQ/Yf0Wgukuj_U/s1600/romo-is-ded.jpg)

Posted 4th April 2012 by [Piotr Kula](#)

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