

P68A

Pico 1A Autaset Speed Controller



WHY USE 'pico' INSTEAD OF A SERVO AMP?

Servo amps are made to drive servos and suffer from lack of slow control and a very poor centre dead-band (the bit of stick movement around centre where the motor should not run). If the motor is used to directly drive the prop, it may easily exceed the rating of its amplifier because servo amps are designed to drive a motor with a gearbox. Finally, as most of them use SMT (Surface Mount Technology) modern servo amps are not repairable.

'pico 1' uses a microcomputer to control a special IC which was designed to drive motors on compact disc players and video recorder loading doors. It will shut down if overheated or current limit is exceeded. It is VERY current-efficient as its uses include battery-driven equipment. Not previously available in UK, ACTION has imported the device just for this project.

'pico' P68a features:

No adjustments; low frequency; linear speed increase; failsafe operation; over-current & over-temperature shutdown; simple connection; light weight; low cost; miniature size; screwed case. It plugs into the receiver like a servo; only a 4-cell battery pack is required to power the whole model. This is a tried and tested design with hundreds in use worldwide.

Ideal for use on its own in the smallest of plastic model kit conversions, or fit two in conjunction with the P82 Micro Motor Mixer in tiny, twin-motor models.

MICROCOMPUTER & CUSTOM IC DESIGN

Functions

Radio control channels required

Neutral setup

Working receiver voltage (4 x nicad)

Working receiver voltage (4 x alkaline)

Maximum current rating (stall)

Forward & reverse/speed

One

Autaset (allow 2 seconds)

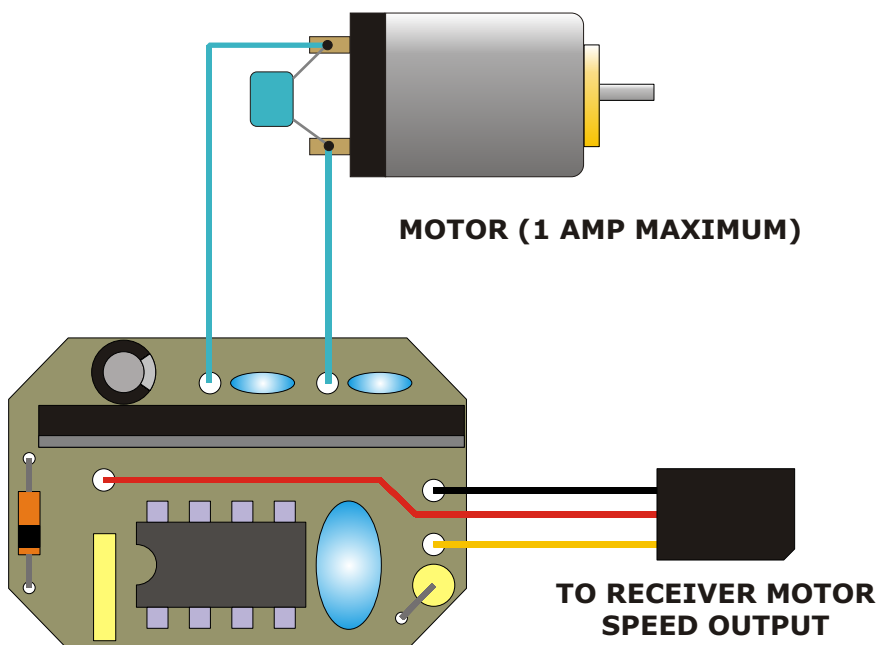
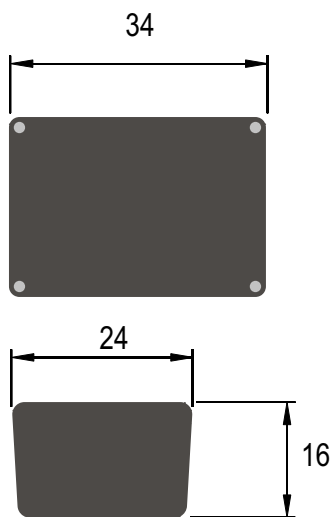
4.8 volts

6 volts*

1 amp peak

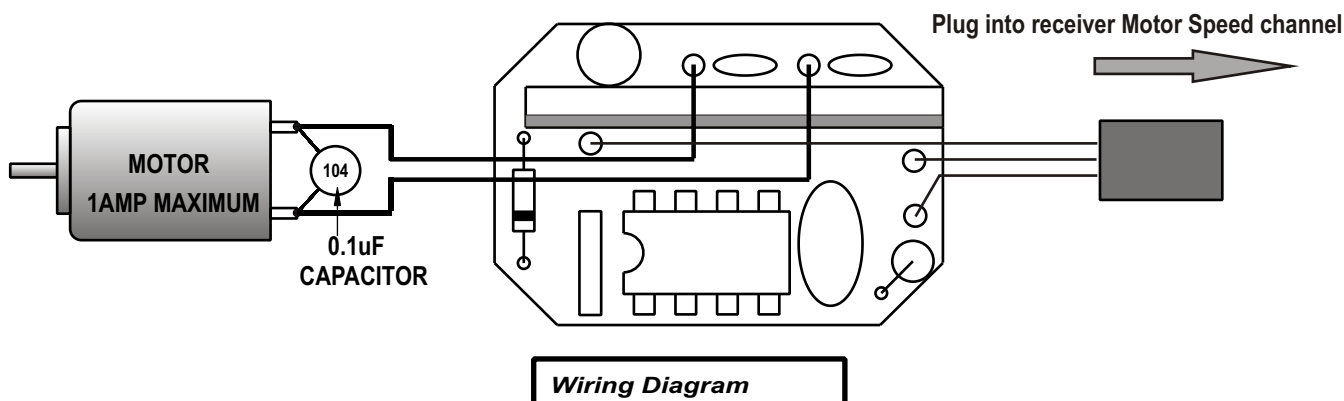
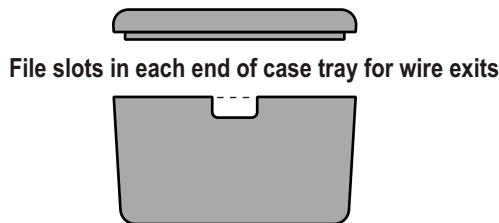
*Do NOT use a 5-cell rechargeable pack or 6v Lead-acid battery to power the receiver *directly*; it will fatally damage the unit. Power *via* a regulated 5v supply such as an ACTION P19 or P99 will be fine.

Case Dimensions



P68A

pico 1A AUTOSET SPEED CONTROLLER



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P68A

Pico 1A Autaset Speed Controller



Functions

- Radio control channels required
- Neutral setup
- Working receiver voltage (nicad)
- Working receiver voltage (dry batt)
- Maximum current rating
- Case size

Forward & Reverse/speed

- One
- Autoset (allow 2 seconds)
- 4.8 volts (Rechargeable) or 6v (Alkaline)*
- 6 volts
- 1 Amp (peak)
- 34mm x 24mm x 16mm

*Do NOT use a 5-cell rechargeable pack or 6v Lead-acid battery to power the receiver *directly*; it will fatally damage the unit. Power *via* a regulated 5v supply such as an ACTION P19 or P99 will be fine.

SETUP

Connect the servo lead to your receiver, ensuring that the receiver power is switched off. Centralise the trim lever on the transmitter throttle/motor-speed stick. Switch on your transmitter first, then switch on the receiver. Wait for 2 seconds for the AUTOSET neutral to operate. You can now move the stick up and down to run the motor forward and reverse. You may have to use the reverser switch on your transmitter to change over the forward and reverse operation; alternately swop over motor wires.

RECOVERY SERVICE

A recovery or repairs service ensures that you will not be left with a dead unit for any reason. The Service Charge for this kit is £11.00 including parts (including return shipping cost in UK). All returns should include full Credit Card details (name & Address of cardholder, Card Number, Expiry date, Security Number)

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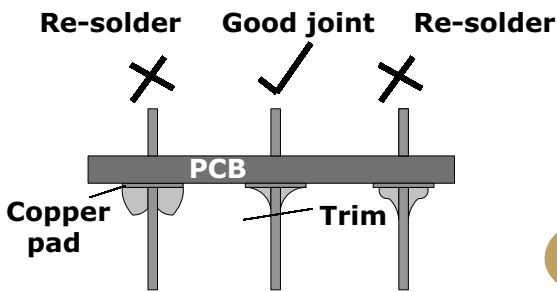
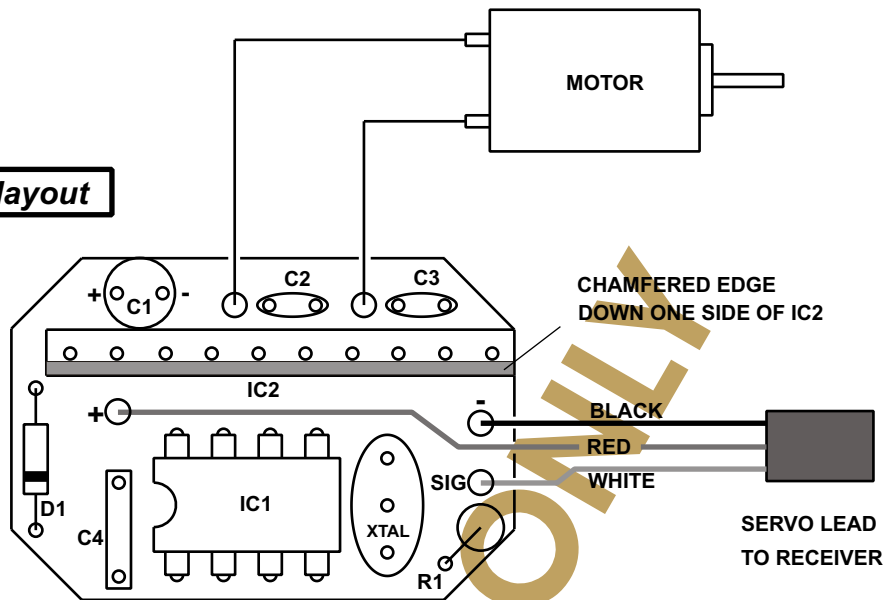
The small print.....

Action R/C Electronics guarantee all products to be free from manufacturing defects for 12 months from date of purchase. This does not cover suitability for specific applications; components worn or damaged by use, tampering or incorrect connection; alteration to original components; damage to batteries or other equipment through use; misuse, or shipping damage. Where goods are found to be faulty, the customer shall return them to ACTION R/C Electronics in their original condition and with their original instructions, packaging etc. Our liability is limited to repairing or replacing goods to their original specification and will not exceed the cost of the goods. By using the product the user accepts all liability. Where a fixed repair charge is applicable, ACTION R/C Electronics shall undertake repairs to the extent that they are judged economically viable. Where such is not the case then the customer will be offered the option of crediting the repair charge towards the cost of a new unit or having the faulty unit returned and the charge refunded (less the cost of return carriage). We reserve the right to modify this guarantee without notice.

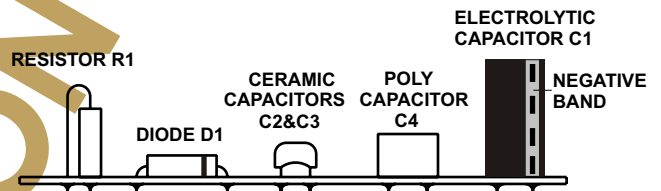


P68A pico 1A SPEED CONTROLLER
Instructions for Kit version

Component layout



Soldering Tips



Component mounting details

PARTS LIST

- IC1 PIC12C508/04 (programmed) IC + 8 pin IC socket (see notes on handling)
- IC2 BA6286N (10 inline pins)
- XTAL 4.0mhz solid state crystal (blue, 3 legs)
- D1 1N4148 diode (small glass component)
- R1 1k ohm resistor 1/8 watt (BROWN/BLACK/RED/GOLD bands)
- C1 22uf min radial electrolytic capacitor
- C2,3 0.1uf monolithic ceramic (marked 104)
- C4 0.22uf poly capacitor (marked .22 J 63)
- Case Type RX2005
- PCB Type P68A
- Lead Futaba generic type supplied, with alternative HiTec/JR type plug.
- WIRE Not supplied with kit - any really fine flexible wire is suitable for motor current

P68A KIT INSTRUCTIONS

TOOLS

For construction you will require a soldering iron with a fine pointed bit and flux cored solder (22 SWG recommended), a small pair of wire cutters and, of course, a good level of light.

PARTS

DO NOT HANDLE ITEMS IN BLACK CONDUCTIVE FOAM UNTIL INSTRUCTED. (MOS DEVICES)

- The PCB has an insulated (Component Side) and a tinned track side. Components are mounted on the insulated side and soldered on the track side. The PCB for this Project is fully prepared and requires no additional work. Look carefully at the area of the PCB you are working on when soldering to ensure that you do not apply an extra connection with a splash of solder
 - The short bar with colour bands and a wire at each end is a resistor. Only one in this kit so no mistakes can arise.
 - The tubular electrolytic capacitor (C1) is marked with the value and working voltage, it also has a band down one side of the plastic sleeve with (-) Negative signs on it which signifies which leg goes to the negative. The opposite leg of the capacitor, of course, goes to the positive. Capacitor polarisations (+ and -) are clearly shown on the drawing.
 - The small Capacitors C2 & C3 (usually coated blue and marked 104) and Poly Capacitor C4 (marked .22 63) have two wires and are not polarised, so they can be fitted either way round.
 - The short glass bar with two wires is a diode D1; note the dark band at one end of it. This band is marked on the drawing in black and D1 must be fitted with its dark bar as shown.
 - The 8-pin integrated circuit (IC1) is marked with its type code; see the drawing together with the Parts List. It is delivered in conductive foam and should be left in the foam until you are about to fit it. Being a MOS device, it can be damaged by static electricity and care must be exercised when handling. It is supplied with a socket. This will enable the builder to solder in the socket during construction, then fit the IC at the end of construction.

NOTES ON CMOS DEVICE HANDLING. USE A SHEET OF ALUMINIUM, COOKING METAL FOIL WILL DO.

Place it on the work surface. Place the PCB, solder side down on it. Place the black conductive foam on it, touch the metal with the soldering iron tip and then rest your hands on it, holding them there while you read through this part of the instructions. The PCB, any tools, the MOS IC and you are now all at the same potential, i.e. static neutralised.

CONSTRUCTION

As very few parts are used in the construction of the "pico", no construction notes are really needed, just a few pointers. I would suggest that you fit the socket for IC1 first, it will help to give you your bearings as to what goes where. Note the small notch at one end of the plastic moulding and ensure that it is fitted as shown in the drawing, soldering all pins carefully. The ICs (IC2 and IC1) should be respectively soldered in and plugged into the IC socket, as the last operation of construction.

WARNING - DO NOT use the black foam as a packing foam in the finished unit, it is CONDUCTIVE.

WIRING

A 3-wire ribbon lead is supplied for connection to the receiver. The positive lead will have to be cut either shorter or longer than the other two, depending on which way you wish the lead to run out of the case. Connect the Positive + lead (Red) and Negative - lead (Black) to the + and - holes as per the drawing. The third lead is the pulse signal lead (White); it is connected to the SIG hole as per the drawing. Care will have to be taken to ensure that you get these connections right.

Fit two fine flexible wires to your motor and the holes in the PCB; these can be any colour.

That's it, the PCB construction is complete. The rear of the board can now be cleaned with something like an old toothbrush and some spirit cleaner. Meths will do but Isopropyl is very much better. Then check all over the soldered side of the board for good joints and no solder bridges between tracks or round pads.

CASE

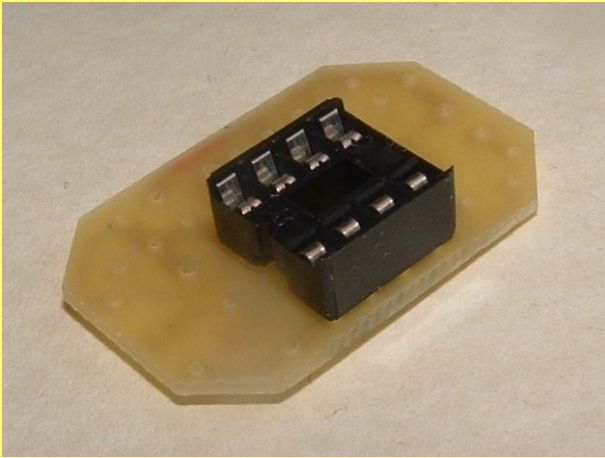
File out a narrow section at the top edge of the case body for the servo lead and a similar slot for the motor wires, in any position that suits your installation.

TESTING

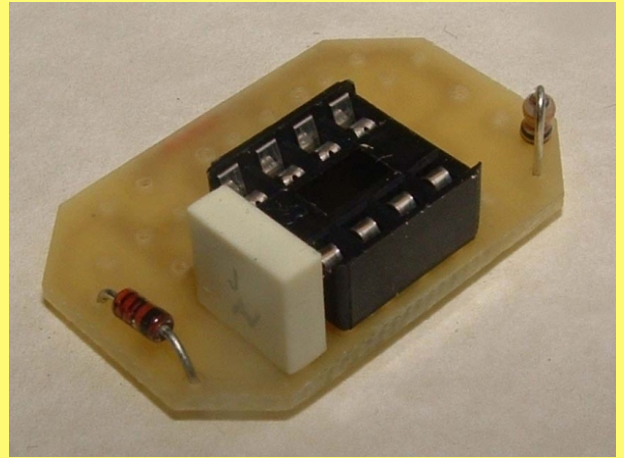
Having built the unit connect the servo lead to your receiver, ensuring that the receiver power is switched off. Switch on your transmitter, then receiver. Allow a couple of seconds after switch on for the Autaset function to set.. You can now move the stick up and down to run the motor forward and reverse. You may have to use the "servo reverse" switch on your transmitter to change over the forward and reverse operation; alternatively just swap over the two wires to the motor contacts.

P68A PICO 1A SPEED CONTROLLER

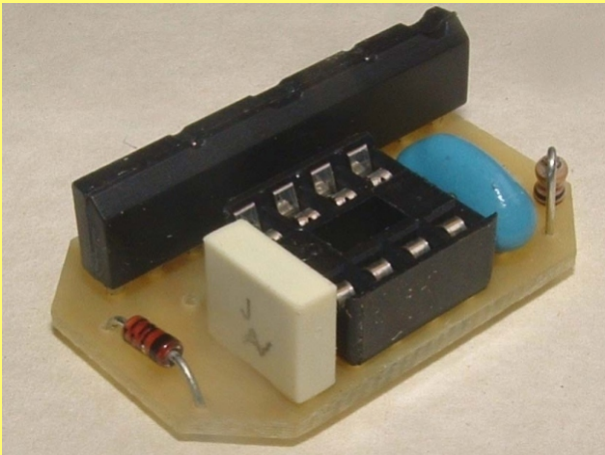
PHOTOGRAPHIC BUILD SEQUENCE FOR KIT VERSION ONLY



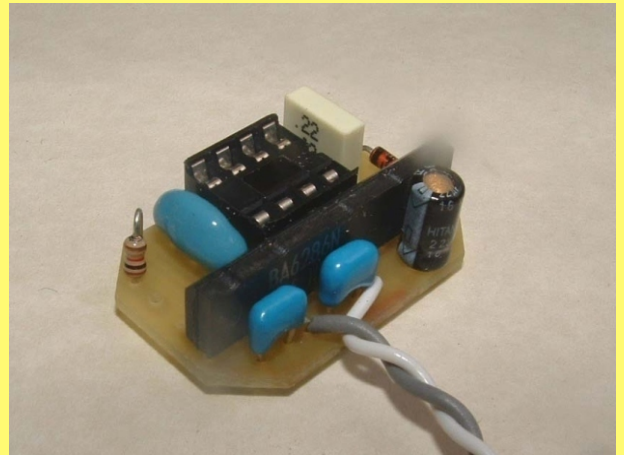
PICTURE 1: PCB with I/C socket fitted



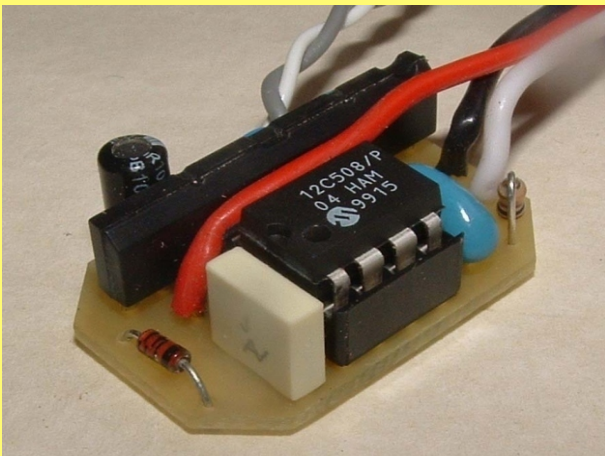
PICTURE 2: Resistor, diode and capacitor added



PICTURE 3: Crystal and power I/C added



PICTURE 4: Remaining capacitors and motor leads fitted



PICTURE 5: Solder Rx lead in place. Plug PIC chip into socket last. NOTE! ANTI-STATIC PRECAUTIONS REQUIRED



PICTURE 6: File slots in case for leads. Fit lid