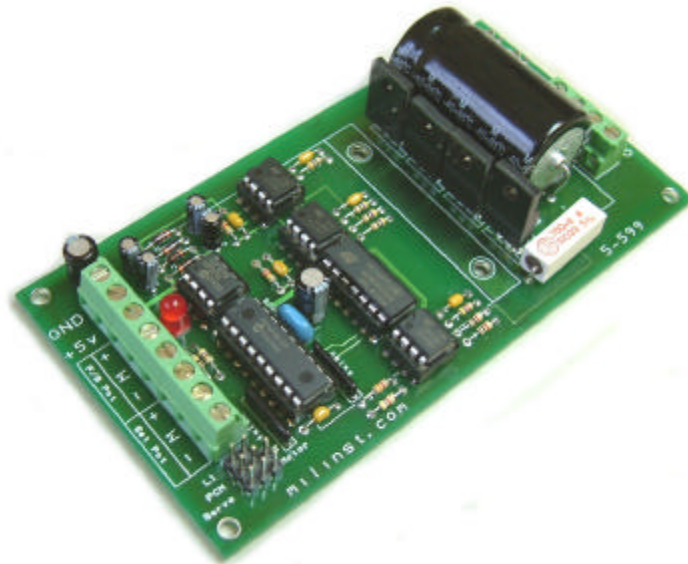# (Servo) Motor Controller

Build your own powerful servo motor.
This (Servo) Motor controller allows standard DC motors (eg car windscreen wiper motors) to be converted into powerful, long-life servos with the same control signals as standard R/C servo motors or with a 0-5V position signal.

The board may be configured to drive the DC motor simply as a variable speed, reversible motor or with the addition of a position feedback potentiometer, to create a powerful servo motor controller for accurate positioning purposes.
The (Servo) Motor controller will drive DC motors rated at up to 36V at 5A continuous current.

Connections and Controls
Motor Connection (+/-)
Connection to the DC motor.

Motor Supply
Maximum rating is 36V DC at 5A continuous (shipped as standard with a 10A fuse)

Electronics Supply
The electronics power supply **must** be electrically separate from the motor power supply.
Requires 5V DC at 250mA.

<u>FeedBack Potentiometer</u>
For servo use, connect a 10K linear potentiometer to these contacts- centre contact to the potentiometer wiper.

<u>Limit Switch Jumper (L1)</u>
If required, connect limit switches to these terminals. The terminals are active when closed and will disable the motor drive amplifier until the short is removed. Connect multiple limit switches in parallel.

<u>PCM-Potentiometer Control Select Jumper (L2)</u>
Select the jumper position for either control by a potentiometer (10k linear recommended) connected to the 'Set Pot ' contacts – the pot wiper is the centre contact or control via PCM (ie the standard 1 to 2msec pulse from an R/C type receiver). Connect the PCM signal to the Wiper connection and the signal ground to the '-' connection.
Note that in PCM mode, if a suitable PCM signal is not detected in approximately 1 second, the drive amplifier will switch off.

<u>Motor-Servo Select Jumper</u>
Select the jumper position for either servo action or for variable speed, reversing motor control operation.

Motor Operation
Set the M-S switch to M and set J2 depending on whether control is by PCM or local potentiometer.

Switch on the power supplies to the controller the motor should start to rotate. The speed and direction of rotation of the motor may now be controlled by adjusting the control signal or potentiometer value. The motor should be stationary with a PCM signal of approximately 1.5msec duration or with the potentiometer in the mid-way position.
If the motor does not respond, make sure you have nothing connected across the Limit terminals.

Servo Operation
Set the M-S switch to S and set J2 depending on whether control is by PCM or local potentiometer.

Connect a feedback potentiometer to the 3-way terminal block. The feedback potentiometer must be physically driven by the mechanism you are controlling and should incorporate a slip coupling in case of over travel.
The servo will give approximately 300 degrees of control depending on the type of feedback potentiometer you use- if this is less or more than you require, you will need to include appropriate gearing into your equipment to give this amount of rotation. Linear potentiometers may also be used.
For long term usage, we recommend a high quality feedback potentiometer with a high mechanical cycle rating such as the Spectrol 357-2-0-103 series (with end stops). This particular unit is rated at 10 million cycles and 340 degrees rotation. By comparison, you can expect approximately 25,000 cycles with standard carbon potentiometers.

DC Motor

Your Equipment

Feedback
Potentiometer

Servo-Motor
Controller

Slip coupling
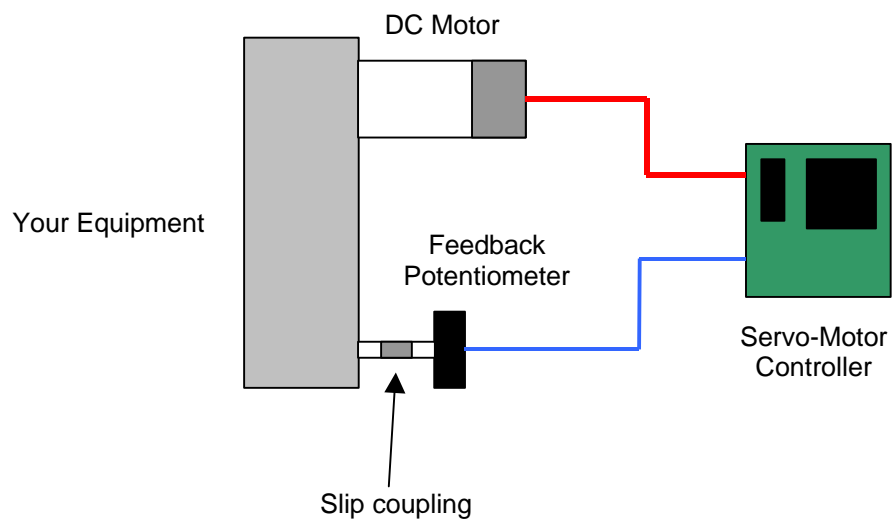
This is how we modified a standard motor-gearbox:
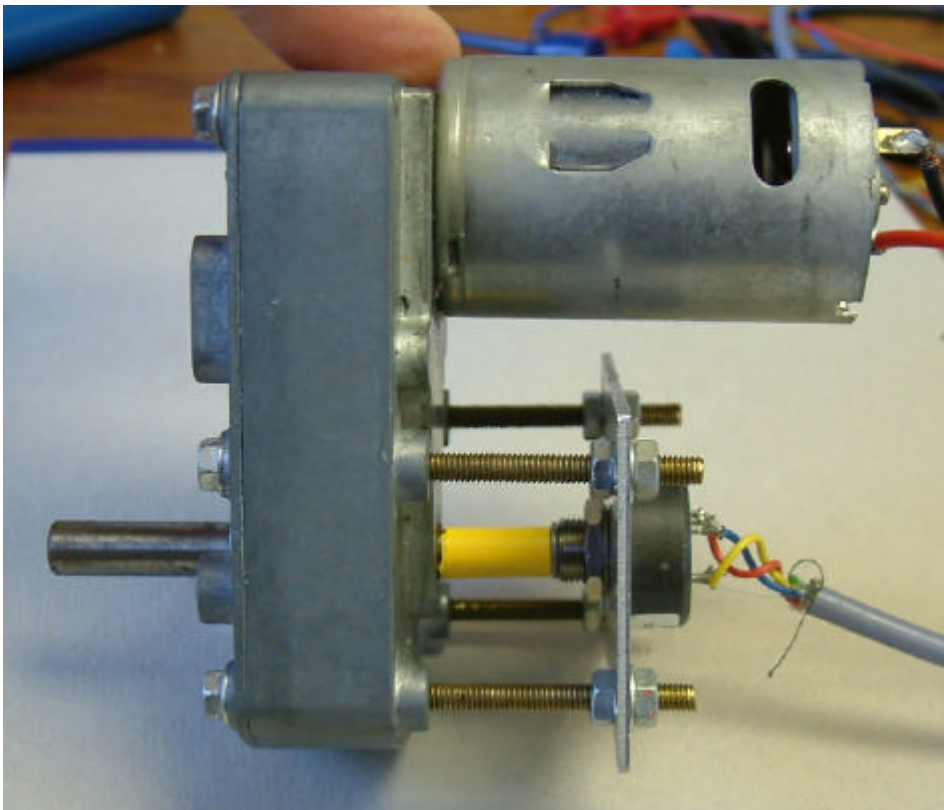
Before connecting the motor supply, bare in mind you have a 50/50 chance of having the motor connections reversed. Make sure you can disconnect the motor power quickly!

Switch on the power supplies to the controller. The motor should start to hum and rotate until the feedback potentiometer value matches the set point.
If the motor continues to move or judder, switch off the power and reverse the motor connections.

If the motor does not respond, make sure you have nothing connected across the Limit terminals.

Board size
The (Servo) Motor controller pcb size is 120 x 65 x 30mm high