

**Astro 020 Planetary Geared Motor  
020 Planetary System with control p/n 803P  
020 Planetary Motor only.....p/n 803PM**

Congratulations you have just purchased one of the finest brushless planetary motors made for electric models. The new Astro 020 Brushless Motor has the latest advances in hi-tech, a samarium cobalt rotor and a Lithium compatible sensorless speed controller.

**The Astro 020 Planetary Motor** is very small. It is only 0.975 inches in diameter, 2.75 inches long and weighs only 3.75 ounces. On a ten cell Nicad pack, the Astro 020 Geared motor can handle over 300 watts. .

**The Sensorless Control** has a decoder for the radio receiver signal and a micro processor for controlling the motor. Actual commutation is done by a six phase Mosfet bridge housed in six tiny surface mount packages. The control can safely handle 25 amps but the motor should be limited to 20 amps maximum for continuous running. **We recommend choosing a propeller that limits the current draw on the ground to a maximum of 25 amps on a fully charged battery pack.** This way the current draw in the air will be about 20 amps for best motor efficiency and longest flights. The entire control is very small measuring 1 inch by 3/4 inch and 1/8 inch thick. The control weighs 1/2 ounce. One side of the circuit board contains the 1 amp BEC circuit and the other side contains the commutation control chip and the power mosfets. The control comes with Astro 2 pin connectors and is Lithium Compatible.

**No Adjustments** The sensorless speed control has no adjustments and is set up to work with any airplane radio control unit. The control adjusts to your radio low throttle command as long as the command is between 1ms and 1.3 ms.

Motor speed will increase linearly up to full throttle as the transmitter pulse width is increased by 0.7 ms.

**Safe Start** The speed control has a safe start feature. The software requires a continuous low throttle command between 1ms and 1.3ms for five seconds after battery power is applied before it allows the motor to start. When first setting up your transmitter you may have to set the throttle trim low and the throttle stick low before advancing the throttle stick to get the motor to run. Once the motor starts running the control will respond to radio command as long as battery power is present. If the motor does not start, set your throttle gain to plus 100% and minus 100% and set the transmitter throttle reversing switch to reverse position.

**Brakes** The control is manufactured with brakes. The brakes can be activated and de-activated. To de-activate the brakes disconnect battery power and set the transmitter to **Full throttle**.

1. Connect battery power and wait for led to flash.
2. Go to **half throttle** and wait for flash.
3. Go to **full throttle** and wait for flash.
4. Go to **half throttle** and wait for flash.
5. Go to **low throttle**, and then disconnect motor battery. Next time you power up the brakes it will be de-activated. To re-activate the brakes, repeat the above procedure except at step 5 go to **Full throttle**.

**Reverse** The brushless 020 Motor can be run in either direction. To reverse the motor direction, interchange any two of the three motor wires connecting the motor to the control.

**BEC** This speed control has a BEC circuit so that you do not need to install a separate receiver Nicad in your model.

**Voltage cut off.** This speed control has an automatic voltage cut off to prevent your battery from being discharged too far. This is especially important for Lithium Polymer batteries.

## Astro 020 Motor Characteristics

<b>Part No.</b>	<b>803P</b>
<b>Name</b>	<b>020 Planetary</b>
<b>Winding</b>	<b>5 turns #20</b>
<b>Kv of motor</b>	<b>2567 rpm/volt</b>
<b>Winding Resistance</b>	<b>0.070 ohms</b>
<b>Gear Ratio</b>	<b>4.4 to 1</b>
<b>Kv of Geared Motor</b>	<b>583 rpm/volt</b>
<b>No load current</b>	<b>1 amp</b>
<b>Magnets</b>	<b>Sm Cobalt</b>
<b>Bearings</b>	<b>Ball Bearings</b>
<b>Motor Diameter</b>	<b>0.98 inches</b>
<b>Length Geared Motor</b>	<b>2.75 inches</b>
<b>Weight Geared Motor</b>	<b>3.75 ounces</b>
<b>Motor Shaft Diameter</b>	<b>1/8 inch</b>
<b>Prop Drive Diameter</b>	<b>4mm</b>
<b>Control Type</b>	<b>Sensorless</b>
<b>Control Rating</b>	<b>25 Amps</b>
<b>B. E. C. Rating</b>	<b>1 A @ 5V</b>
<b>Voltage cut off</b>	<b>Automatic for Lipo</b>
<b>Power Connector</b>	<b>Astro 2 pin</b>
<b>Servo Connector</b>	<b>Universal</b>
<b>Voltage Range</b>	<b>6 to 12 volts</b>
<b>Maximum Current</b>	<b>25 amps</b>
<b>Maximum Power</b>	<b>200 watts</b>

**Expected Performance with CAM 14 x 8 prop**

Battery	Amps	Watts	Rpm
2 Lithium	14 amps	111 watts	3,900 rpm
8 Nicad	17 amps	153 watts	4,400 rpm
3 Lithium	23 amps	260 watts	5,100 rpm
10 Nicads	26 amps	312 watts	5,400 rpm

**Expected Performance with a CAM 15x13 prop**

Battery	Amps	Watts	Rpm
2 Lithium	24 amps	184 watts	3,200 rpm
8 Nicads	27 amps	234 watts	3,400 rpm

**Expected performance with 16x10 APC-E**

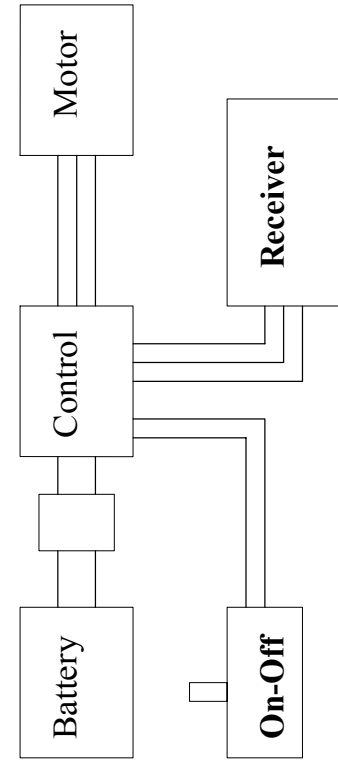
Battery	Amps	Watts	Rpm
6 Nicads	16 amps	110 watts	3,200 rpm
2 Lithium	20 amps	151 watts	3,400 rpm
8 Nicads	24 amps	215 watts	3,800 rpm

**Other parts you may need**

Stock No	Name	Price
101	Super Whattmeter	\$59.95
105	Servo Tester	\$19.95
109	Deluxe Lithium Charger	\$129.95
110	Deluxe Digital Charger 1-24 cells	\$129.95
202	25 Amp Speed Control	\$74.95
521	Astro 3 pin connector	\$9.95
525	Astro 2 pin connector	\$5.95
710	Helical Gear Box 3.3 ratio	\$34.95

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**Wiring Diagram**



Connect servo cable from control to throttle channel of receiver

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