

# Mini - Skymaster

## Miniature Speed Controller

### Purpose

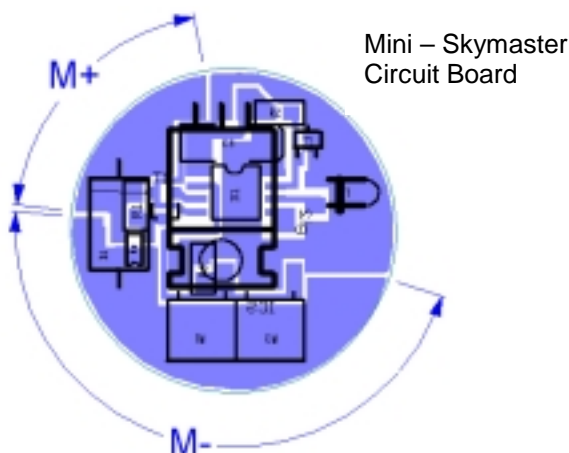
Mini - Skymaster was specifically designed for electric model aircraft running "stock" 27 turn motors on 6 to 12 cells. It will handle currents up to 20 Amps continuous on variable throttle with proper ventilation.

### Features

- Small Package (only 32mm dia x 9mm thick)
- BEC for radio 1Amp continuous.
- Low battery voltage motor shutdown to keep enough battery power in reserve to run radio and servos during gliding.
- Low on resistance (~7mΩ)
- Inbuilt soft start to prevent damage to lightweight propellers.
- Brake to assist folding propeller operation and prevent wind milling.
- Radio signal loss failsafe. Applies brake after 1/8th sec. without radio pulse train. Flashes LED to indicate failure.
- LED which shows radio signal failure, full throttle and brake.

### Mounting and Connections

1. Mini - Skymaster was designed to be soldered directly to the motor terminals; however, wires can be used if desired. Solder the motor positive terminal to any part of the M+ area marked in the following diagram, and the M- terminal to the corresponding M- area. Extend motor terminals if necessary.
2. Connect the radio lead to the throttle slot in the radio receiver. Swap leads in the plug if necessary. (JR type plug attached).
3. Finally, attach the battery to the power leads (Red = +ve).
4. No external Schottky diode is required as it is included in the device.
5. Keep the radio lead as far away from the power leads and motor as possible to reduce interference.
6. If connecting the motor to Mini - Skymaster with wires, keep the leads as short as possible. Make sure radio interference capacitors are fitted to the motor. These measures will help prevent radio interference.



### Programming

Mini - Skymaster does not require programming, throttle range is preprogrammed.

### Operation

Mini - Skymaster is designed to be used on non-centring throttle radios (standard 3 channel or more model radio transmitters). The throttle range operates from a fairly low stick position to almost full stick movement for full throttle.

Throttle trim may have to be adjusted so that the full range can be achieved.

As throttle is applied from the "OFF" position, Mini - Skymaster will start to apply power from 20% of the maximum. This should be a high enough value to cause folding propellers to activate. The power up is restricted by an internal soft start, which limits the increase in power to 10% per 1/10th of a second. This means that even though the throttle may be increased immediately to full throttle, full throttle won't be achieved till ~0.8 second later. When full throttle is reached the LED lights to indicate this.

Reducing throttle has an immediate effect; power reduces immediately as the throttle is reduced. When the off position is reached, the motor is allowed to "spin down" for 1 second before the brake is applied, at which time the LED again lights to indicate brake.

Low battery check occurs 1 second after full throttle is reached, and then continuously during full throttle (this prevents high start up currents from triggering the shutdown). When shutdown occurs (4.2 V controller supply voltage or less), the motor is disabled and throttle cannot be reapplied. The radio is still operational.

To reset the Mini - Skymaster shutdown, disconnect it from the battery and reconnect.

### Ventilation

All electrical power components produce heat. The heat produced by the Mini - Skymaster is removed by the surrounding air. Model aircraft are normally very enclosed spaces. Please ensure enough ventilation to prevent the heatsink (M- track) from exceeding 70°C. The ventilation required for motor cooling would normally be enough for the Mini - Skymaster as well, particularly at lower current drains.

**Warranty** - Mini - Skymaster is warranted for life against faulty parts or workmanship. Abuse, reverse connections & exceeding maximum ratings are not covered

### Specs

Dimensions	32mm dia x 9 mm
Rating	6 - 18Vdc, 20Amp continuous with BEC
BEC radio connection	5Vdc, 1Amp continuous
Controller power consumption	6 mAmps maximum
Maximum heat sink temp.	70°C

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### Disclaimer

Although great care was taken in designing, programming and assembly of this speed controller, the end user will take all responsibility for any damage or injury caused by any device containing this controller. Due to the nature of radio control, no guarantees can be given as to the safe use of this product.