

# CIRRUS MICRO JOULE OPERATIONS SHEET

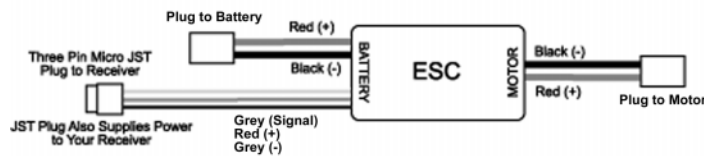
## FOR S-5A1 ESC, S-5A2 ESC, 4-CHANNEL MICRO RECEIVER AND CS-3 ULTRA-MICRO SERVO

This instruction sheet covers the four separate items listed above. Service and warranty information is listed on the back of this sheet.

### CIRRUS MICRO JOULE S-5A1 AND S-5A2 ELECTRONIC SPEED CONTROLS:

#### Important Information:

- The installation of both ESCs is the same. Specifications for both ESCs are listed below



#### Specifications for S-5A1:

Dimensions: 6.5mm x 12.5mm x 3.6mm

Weight: 1.9 Grams (.067 Ounces)

Input Voltage: 2.7 Volts - 4 Volts

Continuous Current: 5 Amps

Surge Current: 8 Amps

Switching Frequency: 2000Hz

BEC: Yes - Output .5 Amps

Auto Cutoff: Yes @ 2.6 Volts

Recommended Cells: 1 Lithium Polymer or 2-3 NiCD/NiMH

#### Introduction:

The Cirrus Micro Joule S-5A series of electronic speed controls are designed for DC brush-type motors in micro electric aircraft. Its factory-installed micro JST plugs make it easy to install in most micro electrics. For those with experience, weight can be saved by direct-wiring to the motor. The Micro Joule S-5A series ESCs are designed to extend motor and battery life, and increase flight time. Its high-frequency and smooth powerband are programmed to eliminate current loss and to reduce motor brush arcing. Please read this guide carefully before operating your new Micro Joule S-5A series ESC.

#### Safety Warnings:

- Do not** short-circuit any of the wires.
- Do not** attempt any type of soldering to or from the PC board.
- Follow the input and output wiring diagram carefully. Connecting the battery to the motor plug will produce immediate speed control failure and possible fire, and will not be covered by the warranty.
- Double-check the plug wiring polarity and order before connecting the ESC to the receiver.
- Keep hands, body parts and any objects out of the way of the propeller. Test the operation of the ESC before installing the propeller.
- Do not** subject the ESC to moisture or water.
- Do not** attempt to operate the ESC outside of its specifications.
- Keep the ESC out of direct sunlight and away from extreme temperatures.
- Keep the ESC away from the receiver and the receiver antenna.
- Install the proper motor capacitors onto your motor - described below.



Capacitors eliminate electronic noise from the motor, preventing radio interference. Three capacitors should be installed.  
**(View of Motor Endbell)**

#### Specifications for S-5A2:

Dimensions: 8mm x 18.75mm x 6.25mm

Weight: 2.78 Grams (.099 Ounces)

Input Voltage: 7.2 Volts - 12 Volts

Continuous Current: 5 Amps

Surge Current: 8 Amps

Switching Frequency: 2000Hz

BEC: Yes - Output .5 Amps

Auto Cutoff: Yes @ 72% of Fully Charged Li-Po or Li-Ion Battery

Recommended Cells: 2-3 Lithium Polymer or 3-6 NiCD/NiMH

#### S-5A1 and S-5A2 ESC Features:

- Electronic Arming:** Throttle must be cycled from low to high, and back to low before the ESC can arm.
- High Frequency:** The ESC operates at 2000Hz. This provides smooth motor response at low throttle settings and allows the motor to run cooler.
- BEC/Auto-Cutoff Reset:** After the auto-cutoff has engaged, (when the battery has reached the minimum safe voltage) the ESC will reset after the throttle stick is held in the "off" position, then recycled as described in the installation and setup section below. Low battery voltage will result in the motor cutoff, but reserve battery power can be used to reset the ESC in the air for a safe return to the field.
- Auto-Cutoff for S-5A2 ESC:** Auto-cutoff for this ESC is based on a percentage (72%) of a fully charged battery. For proper operation, it's important to use a fully charged battery with this ESC.

#### Installation and Setup:

- Install three capacitors to your motor, using the diagram at bottom left.
- Connect the motor wires on the ESC to your motor.
- For safety, remove the propeller from your motor. Once testing is complete, reinstall the propeller onto your motor.
- Connect the ESC throttle lead (JST plug) to your receiver. Check the polarity and plug orientation to ensure that it is correct.
- Position the throttle stick on your transmitter to the low throttle (off) position. Turn on your transmitter.
- Connect a charged battery to the ESC. Connecting the battery turns on the ESC and airborne radio. There is no separate on/off switch.
- Cycle the throttle stick from low to high, then back to the low position. This cycles and arms the ESC. Now, move the throttle stick forward to make sure that the motor turns on. If the motor does not operate, move the stick back to the low position, then switch the throttle reversing switch on your transmitter. Remember, this speed control is electronically armed. This means that the motor will not operate until the transmitter throttle stick has been cycled as described.
- The motor speed should operate in direct relation to the throttle stick position on your transmitter.
- When the battery has reached a voltage too low to safely operate the airborne radio and the motor, the motor will be switched off. The motor can be rearmed by cycling the throttle stick as described previously.

## **CIRRUS MICRO JOULE 4 CHANNEL MICRO RECEIVER:**

### **Specifications:**

Dimensions: 7.9mm x 28.2mm x 8.4mm  
Weight: 3.05 Grams (.11 Ounces)  
Channels: 4  
Range: 100 Meters Minimum (110 Yards)  
Modulation: FM  
Power: 3.5 Volts - 7 Volts  
Shift: Automatic Shift Select  
Tuner: Single Conversion, Narrow Band  
Plug Type: Micro JST  
Compatibility: Any PPM or FM Modulation Hobby Transmitter

### **Important Information:**

- **Do not** reverse polarity of the power source.
- If you use all four channels, you must use a Y-harness to connect your flight battery to the receiver. Cirrus P/N 443484.
- **DO NOT** cut the receiver antenna shorter.
- After mounting the receiver, make sure to uncoil the receiver antenna completely.
- **Do not** use this receiver outside of the voltage range.
- This receiver is designed for small R/C aircraft **ONLY**.
- **Do not** get this receiver wet or expose it to moisture.
- **Do not** short circuit the input/output or PC board.

### **Crystal Information:**

- The receiver does not include a crystal. You must purchase the compatible crystal on the same frequency as your transmitter for the receiver to operate correctly. The Micro Joule 4 Channel Micro Receiver uses a UM1-compatible micro crystal, Cirrus P/N 4461xx. XX being the frequency number of your transmitter (i.e., if your transmitter is on frequency number 52, the crystal you would purchase would be P/N 446152).

## **CIRRUS MICRO JOULE CS-3 ULTRA-MICRO SERVO:**

### **Specifications:**

Dimensions: 6.3mm x 22.25mm x 10.10mm  
Weight: 2.85 Grams (.10 Ounces)  
Power: 3 Volts - 7 Volts  
Torque: @ 3 Volts - 300 Grams/Cm (10.5 Ounces/In)  
Torque: @ 4.8 Volts - 400 Grams/Cm (14 Ounces/In)  
Speed: @ 3 Volts - 0.20 Sec/60°  
Speed: @ 4.8 Volts - 0.18 Sec/60°  
Plug Type: Micro JST (Included)  
Compatibility: Any PPM or FM Modulation Hobby Transmitter

### **Important Information:**

- **Do not** reverse polarity of the power source.
- A Y-harness is available separately. Cirrus P/N 443484.
- **Do not** use this servo outside of the voltage range.
- This servo is designed for small R/C aircraft **ONLY**.
- **Do not** get this servo wet or expose it to moisture.
- **Do not** short circuit the input/output or PC board.
- The servo arm is held on with a small screw. Do not overtighten.
- Mount servo using a small dab of hot glue or 5 minute epoxy.

### **Servo Lead Compatibility Information:**

- The servo lead is removable by use of a factory-installed connector on the base of the servo. This allows you to replace the servo lead or change it to a different type (i.e., "Hitec S/JR lead). Replacement Micro JST leads are available. Cirrus P/N 443480. Replacement leads with "S/JR" plugs are also available. Cirrus P/N 443482.

## **SERVICE AND WARRANTY INFORMATION:**

Your new Cirrus Micro Joule product is guaranteed to be free of workmanship and component error for a period of 90 days (60 days for Micro Joule 4 Channel Receiver and CS-3 Ultra-Micro Servos) starting from the original time of purchase. Warranty claims must be accompanied by an itemized sales receipt that shows the purchase date.

In that Cirrus has no control over the final use of this product, by installing the product, the user accepts all liability resulting from or included with the installation and use of this product. In no instance will the liability cost of the speed control exceed the original purchase price of the speed control.



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