

Fits all kits designed for black powder "E" motors

# F21-4W

motor

# econojet™

RECOMMENDED FOR AGES 16 YEARS OR OLDER.  
Adult supervision recommended for those under 16.  
CAUTION: Keep out of the reach of small children.

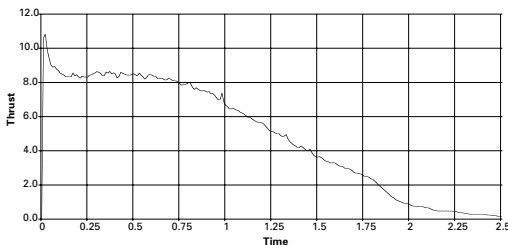
## F21-4W

motor

## Performance Specifications

Motor Type:	F21-4W
Delay:	4 sec.
Dimensions:	.94" x 3.75" (24 x 96 mm)
Motor Weight:	2.3 oz. (64 gms.)
Propellant Weight:	1.1 oz. (30 gms.)
Propellant Type:	White Lightning™
Propellant Effect:	Bright White Flame, Dense Tracking Smoke
Total Impulse:	12.4 lb-sec. (55 N-sec.)
Peak Thrust:	11 lbs. (48 N)
Average Thrust:	5 lbs. (22 N)
Burn Time:	2.4 sec.
Max. Recomm. Lift-off Wgt:	20 oz. (504 gms.)

This motor requires a 12V ignition system with at least 30 ft of cable



Prod. No.: 62104



## Read and Follow All Instructions Before and During Use!

Use these model rocket motors only in accordance with these instructions. Econojet Composite Model Rocket Motors are NOT toys! Handle all model rocket motors with care and respect. AeroTech strongly recommends the Interlock launch controller (or a comparable 12 volt system) be used with all Copperhead igniters.

### General Information

Econojet composite model rocket motors are the most technically advanced model rocket motors in the world. Econojet motors use the same propellant as America's space boosters. Pound for pound, this propellant delivers nearly 3 times the power of black powder used in other model rocket motors. Econojet composite model rocket motors allow you to fly larger rockets, heavier payloads, and achieve higher altitudes than ever before!

### Motor Classification

Each Econojet composite model rocket motor is marked with a code (e.g. F21-4W) which gives important information about the motor's performance. The letter indicates the total impulse (in Newton-seconds) produced by the motor. Each succeeding letter indicates a power level up to twice that indicated by the previous letter. For example, an "F" motor can be twice as powerful as an "E" motor. The number following the letter code indicates the motor's average thrust in Newtons. The next number of the code shows the time delay in seconds between propellant burn-out and the firing of the ejection charge. The letter following the time delay code shows the type of propellant formulation used in the motor. "W" for White Lightning™, "T" for Blue Thunder™, and "FJ" for Fast Black Jacket™.

### Storage and Handling

Store Econojet composite model rocket motors in a dry place where the temperature will remain between 45°F and 100°F. Do not cut, saw, attempt to alter the size, attempt to disassemble, attempt to modify, or drop an Econojet composite model rocket motor. Do not use an Econojet composite model rocket motor that you believe has been damaged or may be defective in any way. Do not ignite an Econojet composite model rocket motor indoors. Do not breathe fumes from the rocket motor exhaust.

### First Aid

For a minor burn, apply burn ointment. For a severe burn, immerse the burned area in ice water at once and see a physician as quickly as possible.

In the unlikely event of oral ingestion of the propellant, induce vomiting and see a physician as quickly as possible. The Econojet composite model rocket motor contains a propellant that consists of ammonium perchlorate and a rubber-like plastic elastomer.

### Disposal

Damaged, defective, or unwanted motors should be disposed of in the following manner. Pack the motor firmly in the ground, with just the nozzle showing, away from buildings, people, animals, and flammable materials. Be sure the nozzle is pointing straight up and is clear. Ignite electrically, per ignition instructions, from a distance of 30 feet or more. Propellant, delay, and ejection charge will burn until consumed. Do not approach for at least five minutes after the firing. Do not put any part of your body over the motor during the process. Dispose of spent motor in inert trash. **WARNING:** Remember that the motor will be very hot after firing. Allow time for it to cool down!

### Fire Safety

Controlled tests show that composite propellant model rocket motors will not explode in fires and normally will not ignite if subjected to intense, sustained fires for two minutes or less. Use water to fight fires in which Econojet composite model rocket motors may become involved; direct the water at the Econojet composite model rocket motors to keep them below their 550°F autoignition temperature. Foam and carbon dioxide fire extinguishers will NOT extinguish burning propellant of the type used in Econojet composite model rocket motors.



# econojet™

## Instructions for Use

### PLEASE READ CAREFULLY Copperhead™ Igniter Installation and Econojet™ Motor Ignition.

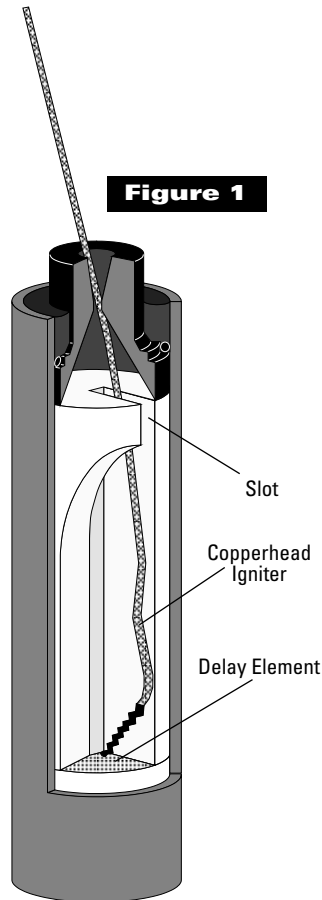
1. Select and carefully straighten one of the two AeroTech Copperhead™ igniters provided.
2. Holding the Copperhead™ between thumb and forefinger, insert the black-coated end into the nozzle and probe for the slot in the propellant grain. Slowly rotating the motor while probing with the tip of the igniter may help in finding the slot.
3. See Fig.1. Once the Copperhead™ has entered the propellant grain slot, continue inserting it until contact is made with the delay element at the forward end of the motor.

Approximately 3.125 inches of a Copperhead™ should enter an Econojet™ F motor.

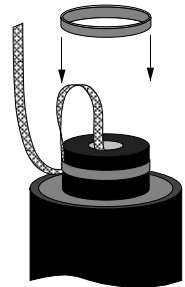
Failure to insert a Copperhead™ igniter as described may result in low-thrust ignition of the motor.

4. See Fig.2. Gently bend the end of the Copperhead™ that protrudes from the nozzle into an "S" and use one of the supplied elastic bands to secure the igniter to the side of the nozzle. (Avoid sharply bending a Copperhead™ as a crack in the copper foil may occur if the igniter is later straightened.)
6. Carefully inspect all elements of the rocket's recovery system to insure they are in good condition prior to their installation and the final assembly of the airframe.
8. Make sure your AeroTech Interlock™ electrical launch controller is disarmed and then attach the igniter clip to the Econojet's Copperhead™ igniter. For safe, reliable initiation of Copperhead™ igniters with other electrical launch controllers, use of the AeroTech Interlock™ igniter clip is strongly recommended.
9. Stand at least 30 feet from the launch pad when flying a model rocket powered by an AeroTech Composite Model Rocket Motor. Do not allow spectators to stand less than 30 feet from the launch pad. After arming the Interlock™ electrical launch controller give a loud, audible five second countdown before pressing the launch button.
10. Read and follow the Model Rocket Safety Code of the National Association of Rocketry (NAR)

**Figure 1**



Elastic Band



**Figure 2**

### STATEMENT OF WARRANTY

**Limitation of Liability:** As we cannot control the storage and use of our products, once sold we cannot assume any responsibility for product storage, transportation or usage. RCS Rocket Motor Components (RCS), Inc. shall not be held responsible for any personal injury or property damage resulting from the handling, storage or use of our product. The buyer assumes all risks and liabilities therefrom and accepts and uses Econojet/RCS products on these conditions. No warranty either expressed or implied is made regarding Econojet/RCS products, except for replacement or repair, at RCS's option, of those products which are proven to be defective in manufacture within one year from the date of original purchase. For repair or replacement under this warranty, please contact RCS. Proof of purchase will be required. Note: Your state may provide additional rights not covered by this warranty.

**Single-Use Motors:** Covered 1 year with a copy of your paid invoice or other proof of purchase: Case rupture, failure of delay to light or to remain lit (i.e., partial remaining unburned delay element), failure of ejection charge to function (must have intact ejection cap or no charring of bulkhead), case or bulkhead burn-through. Not covered: Failure to ignite, any failure of recovery system deployment (provided ejection charge functions).

AeroTech, AeroTech Consumer Aerospace, the AeroTech Consumer Aerospace logo, Copperhead, Econojet, the Econojet logo, Interlock, Mantis and the RCS Rocket Motor Components logo are trademarks of RCS Rocket Motor Components, Inc.