

# HP-G75M COMPOSITE MOTOR INSTRUCTIONS

## WARNING-FLAMMABLE: Read All Instructions Before Use Including Precautions About Sparks.

Use HP-G75M rocket motors only in accordance with these instructions. SALE TO PERSONS UNDER 18 YEARS OF AGE PROHIBITED BY FEDERAL LAW. For use only by certified users 18 years of age or older. DO NOT SMOKE when using these rocket motors or use in the vicinity of open flames or other heat sources. **CAUTION:** Keep out of reach of children. Produces showers of hot sparks!

### GENERAL INFORMATION

AeroTech composite rocket motors use the same type of propellant as America's space boosters. Pound for pound, this propellant can deliver over 3 times the power of black powder used in other model rocket motors. AeroTech composite rocket motors allow you to fly larger rockets, heavier payloads, and achieve higher altitudes than ever before!

### MOTOR CLASSIFICATION

Each AeroTech composite rocket motor is labeled with a code (e.g. HP-G75-10M) which gives important information about the motor's performance. The "HP" prefix indicates that this is a "high-power" motor for use only by certified consumers. The next 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, a "G" motor can be twice as powerful as an "F" 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: "M" for Metalstorm™, "W" for White Lightning™, "T" for Blue Thunder™, "FJ" for BlackMax™ and "R" for Redline™.

### STORAGE AND HANDLING

Store AeroTech composite 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 AeroTech composite rocket motor. Do not use an AeroTech composite rocket motor that you believe has been damaged in any way. Do not ignite an AeroTech composite rocket motor indoors. Do not breathe fumes from the rocket motor exhaust.

### USE

#### FirstFire Jr. Initiator

Use AeroTech composite rocket motors only in rockets designed and built for them.

Fig.-1

### IGNITION AND LAUNCHING

1. Select and carefully straighten the AeroTech FirstFire Jr.™ initiator provided.

2. Fig.-1 Holding the initiator between thumb and forefinger, insert the black-coated end through the nozzle and into the core of the propellant grain.

Core

Delay Element

3. Fig.-1 Once the initiator has entered the propellant grain core, continue inserting it until contact is made with the delay element at the forward end of the motor. Failure to insert the initiator as described may result in low-thrust ignition of the motor.

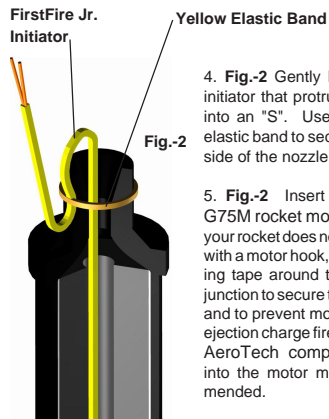


Fig.-2

4. Fig.-2 Gently bend the end of the initiator that protrudes from the nozzle into an "S". Use the supplied yellow elastic band to secure the initiator to the side of the nozzle.

5. Fig.-2 Insert the AeroTech HP-G75M rocket motor into your rocket. If your rocket does not have a motor mount with a motor hook, wrap a layer of masking tape around the motor tube/motor junction to secure the motor in the rocket and to prevent motor ejection when the ejection charge fires. "Friction fitting" an AeroTech composite rocket motor into the motor mount is NOT recommended.

6 Prepare the recovery system of your rocket. Make sure that all elements of the recovery system are in good working order.

7. Slide the rocket onto the rod or rail of your launch pad. Rockets powered by the AeroTech HP-G75M composite rocket motor must be flown from a launch pad having a launch rod or rail at least 36 inches long or two-thirds the combined length of the rocket body and nose cone, whichever is greater. Do not launch a rocket powered by an AeroTech composite rocket motor from any launch rod or rail shorter than that specified in the rocket kit assembly and use instructions. The AeroTech Mantis™ rocket launch pad will accommodate launch rods of several diameters and lengths and may be used with all types of 'G'-powered rockets weighing up to 3.3 pounds..

8. Make sure the electrical launch controller is disarmed and then attach the igniter clips to the initiator. Test the electrical launch controller for proper safe operation before each flying session.

9. Stand at least 50 feet from the launch pad when flying a rocket powered by the HP-G75M. Do not allow spectators to stand less than 50 feet from the launch pad. After arming the electrical launch controller give a loud, audible five second countdown before pressing the launch button.

10. Read and follow the Safety Codes of the National Association of Rocketry (NAR) and the Tripoli Rocketry Association (TRA) and comply with all federal, state and local laws in all activities with high-power rockets.

### MISFIRES

If a misfire occurs and an AeroTech composite rocket motor does not ignite for any reason within five seconds of pressing the launch button, release the launch button and remove the safety key from the Interlock™ electrical launch controller. WAIT ONE MINUTE before approaching or allowing anyone else to approach the rocket. Keep your fingers and hands out from underneath the rocket and away from the possible path of the exhaust jet. Do not place any part of your body over the launch pad. Disconnect the initiator clips from the

initiator. Carefully remove the rocket from the launch pad. Keeping the motor nozzle pointed away from your face and body - and away from any other person's face or body - remove the initiator, and repeat the motor preparation and launching process with a new initiator.

**CAUTION:** The nozzle and the plastic casing of an AeroTech composite rocket motor remain hot for several minutes after operation. Do not touch any part of the motor for at least five minutes after operation. Remove an expended motor casing from a rocket with pliers.

### FIRST AID

For a minor burn, apply a 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 AeroTech HP-G75M rocket motor contains a propellant that consists primarily 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 50 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 AeroTech composite propellant 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 AeroTech composite rocket motors may become involved; direct the water at the AeroTech composite 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 AeroTech composite rocket motors.

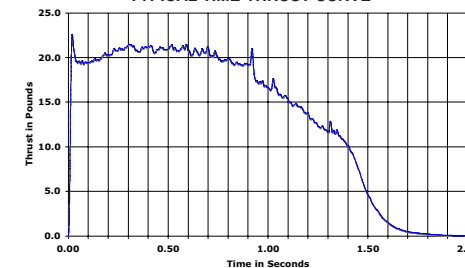
### PRECAUTIONS REGARDING METALSTORM "SPARKY" MOTORS

**CAUTION:** Metalstorm composite rocket motors produce showers of hot sparks during operation which may present a fire hazard. Clear the launch area of all combustible materials for at least a 75 foot radius. Follow the NAR and TRA safety codes at all times. Water or other firefighting media should be available in the event of fire.

### MOTOR PERFORMANCE DATA

MOTOR TYPE	PROPELLANT WEIGHT		TOTAL IMPULSE (TYP)		AVERAGE THRUST	
	oz.	gms	lb.-sec	N-sec.	lbs.	N
HP-G75M	2.36	66.8	27.0	120	16.9	75

### TYPICAL TIME-THRUST CURVE



### NAR HIGH POWER ROCKET SAFETY CODE

1. Certification. I will only fly high power rockets or possess high power rocket motors that are within the scope of my user certification and required licensing.

2. Materials. I will use only lightweight materials such as paper, wood, rubber, plastic, fiberglass, or when necessary ductile metal, for the construction of my rocket.

3. Motors. I will use only certified, commercially made rocket motors, and will not tamper with these motors or use them for any purposes except those recommended by the manufacturer. I will not allow smoking, open flames, nor heat sources within 25 feet of these motors.

4. Ignition System. I will launch my rockets with an electrical launch system, and with electrical motor igniters that are installed in the motor only after my rocket is at the launch pad or in a designated prepping area. My launch system will have a safety interlock that is in series with the launch switch that is not installed until my rocket is ready for launch, and will use a launch switch that returns to the "off" position when released. If my rocket has onboard ignition systems for motors or recovery devices, these will have safety interlocks that interrupt the current path until the rocket is at the launch pad.

5. Misfires. If my rocket does not launch when I press the button of my electrical launch system, I will remove the launcher's safety interlock or disconnect its battery, and will wait 60 seconds after the last launch attempt before allowing anyone to approach the rocket.

6. Launch Safety. I will use a 5-second countdown before launch. I will ensure that no person is closer to the launch pad than allowed by the accompanying Minimum Distance Table, and that a means is available to warn participants and spectators in the event of a problem. I will check the stability of my rocket before flight and will not fly it if it cannot be determined to be stable.

7. Launcher. I will launch my rocket from a stable device that provides rigid guidance until the rocket has attained a speed that ensures a stable flight, and that is pointed to within 20 degrees of vertical. If the wind speed exceeds 5 miles per hour I will use a launcher length that permits the rocket to attain a safe velocity before separation from the launcher. I will use a blast deflector to prevent the motor's exhaust from hitting the ground. I will ensure that dry grass is cleared around each launch pad in accordance with the accompanying Minimum Distance table, and will increase this distance by a factor of 1.5 if the rocket motor being launched uses titanium sponge in the propellant.

8. Size. My rocket will not contain any combination of motors that total more than 40,960 N-sec (9208 pound-seconds) of total impulse. My rocket will not weigh more at liftoff than one-third of the certified average thrust of the high power rocket motor(s) intended to be ignited at launch.

9. Flight Safety. I will not launch my rocket at targets, into clouds, near airplanes, nor on trajectories that take it directly over the heads of spectators or beyond the boundaries of the launch site, and will not put any flammable or explosive payload in my rocket. I will not launch my rockets if wind speeds exceed 20 miles per hour. I will comply with Federal Aviation Administration airspace regulations when flying, and will ensure that my rocket will not exceed any applicable altitude limit in effect at that launch site.

10. Launch Site. I will launch my rocket outdoors, in an open area where trees, power lines, buildings, and persons not involved in the launch do not present a hazard, and that is at least as large on its smallest dimension as one-half of the maximum altitude to which rockets are allowed to be flown at that site or 1500 feet, whichever is greater.

11. Launcher Location. My launcher will be 1500 feet from any inhabited building or from any public highway on which traffic flow exceeds 10 vehicles per hour, not including traffic flow related to the launch. It will also be no closer than the appropriate Minimum Personnel Distance from the accompanying table from any boundary of the launch site.

12. Recovery System. I will use a recovery system such as a parachute in my rocket so that all parts of my rocket return safely and undamaged and can be flown again, and I will use only flame-resistant or fireproof recovery system wadding in my rocket.

13. Recovery Safety. I will not attempt to recover my rocket from power lines, tall trees, or other dangerous places, fly it under conditions where it is likely to recover in spectator areas or outside the launch site, nor attempt to catch it as it approaches the ground.

**NOTICE:** 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 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 AeroTech/RCS products on these conditions. No warranty either expressed or implied is made regarding AeroTech/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.

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