AEROTECH CONSUMER AEROSPACE

Division of RCS Rocket Motor Components, Inc.

G142 HIGH POWER MOTOR INSTRUCTIONS

WARNING-FLAMMABLE: Read Instructions Before Use.

NOTE: SALE TO PERSONS UNDER 18 YEARS OF AGE PROHIBITED BY FEDERAL LAW. FOR USE ONLY BY CERTIFIED HIGH-POWER USERS 18 YEARS OF AGE OR OLDER. DO NOT SMOKE when using these motors or use in the vicinity of open flames. KEEP OUT OF REACH OF CHILDREN.

READ AND FOLLOW all instructions before and during use. Use these rocket motors only in accordance with these instructions. AEROTECH High-Power Rocket Motors are NOT toys! Handle with care and respect.

GENERAL INFORMATION

AEROTECH High-Power Rocket Motors are the most technically advanced high-power rocket motors in the world. AEROTECH 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 high-power rocket motors. AEROTECH High-Power Rocket Motors allow you to fly larger rockets, heavier payloads, and achieve higher altitudes than ever before!

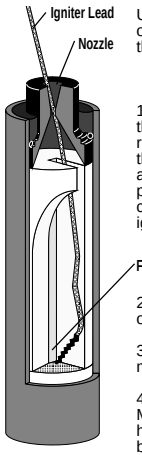
MOTOR CLASSIFICATION

Each AEROTECH High-Power Rocket Motor is identified with a code (e.g. H124-10J) which gives important information about the motor's performance. The first 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 "I" motor can be twice as powerful as an "H" 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 burnout and the firing of the ejection charge. A "P" indicates the motor is "plugged", with no ejection charge. Plugged motors must be used only in rockets fitted with an altimeter, timer or radio-activated parachute deployment system. 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 "J" for BLACK JACK™.

STORAGE AND HANDLING

Store AEROTECH High-Power Rocket Motors in a dry place where the temperature will remain between 45ºF and 100ºF. Do not cut, saw, attempt to alter the size, attempt to disassemble, attempt to modify, or drop an AEROTECH High-Power Rocket Motor. Do not use an AEROTECH High-Power Rocket Motor that you believe has been damaged in any way. Do not ignite an AEROTECH High-Power Rocket Motor indoors. Do not breathe fumes from the rocket motor exhaust.

USE



Use AEROTECH High-Power Rocket Motors only in high-power rockets designed and built for them.

IGNITION AND LAUNCHING

1. Insert a FirstFire™ or other suitable igniter into the motor's nozzle, coated end first. If necessary, rotate the motor to allow the igniter to slide into the propellant core space. Push the igniter as far as it will easily go to the forward end of the motor propellant core space. Failure to insert the igniter completely as described may result in low-thrust ignition of the motor.

2. Bend the protruding end of the igniter back over the nozzle end.

3. Secure the igniter to the motor nozzle with masking tape.

4. Insert the AEROTECH High-Power Rocket Motor into your rocket. If your rocket does not have a motor mount with a motor hook or motor block or has a motor block deeper than the motor length, simply wrap a layer of 1" wide masking tape tightly around the nozzle end of the motor to a thickness equal to that of the motor tube. 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. NEVER friction fit an AEROTECH High-Power Rocket Motor into the motor mount.

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

6. Slide the rocket onto the rod or rail of your launch pad. High-power rockets powered by AEROTECH High-Power Rocket Motors must be flown from a launch pad having a launch rod or rail at least 60 inches long or two-thirds the combined length of the rocket body and nose cone, whichever is greater. Do not launch a high-power rocket powered by an AEROTECH High-Power Rocket Motor from any launch rod or rail shorter than that specified in the rocket kit assembly and use instructions.

7. Make sure the electrical launch controller is disarmed and then attach the igniter clips to the igniter. Use only an electrical launch controller to initiate the igniter of an AEROTECH High-Power Rocket Motor. Test the electrical launch controller for proper safe operation before each flying session.

8. Stand at least 100 feet (but no less than the minimum distance specified in the High-Power Rocket Safety Code for your rocket and motor combination) from the launch pad when flying a high-power rocket powered by an AEROTECH High-Power Rocket Motor. Do not allow spectators to stand less than 150 feet (but again no less than the minimum distance specified in the High-Power Rocket Safety Code for your rocket and motor combination) from the launch pad. After arming the electrical launch controller give a loud, audible five second countdown before pressing the launch button.

9. Read and follow the High-Power Rocket Safety Code of the National Association of Rocketry (NAR) and the Tripoli Rocketry Association (TRA) and comply with all federal, state and local laws and ordinances in all activities with high-power rockets.

MISFIRES

If a misfire occurs and an AEROTECH High-Power 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 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 igniter clips from the igniter. 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 red plastic cap or tape and the igniter, and repeat the motor preparation and launching process.

CAUTION: The nozzle and casing of an AEROTECH High-Power 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 high-power 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 High-Power 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!

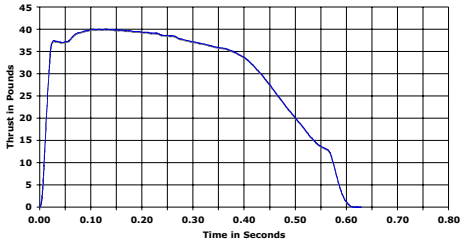
FIRE SAFETY

Controlled tests show that AEROTECH High-Power 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 High-Power Rocket Motors may become involved; direct the water at the AEROTECH High-Power Rocket Motors to keep them below their 550ºF autoignition temperature. Foam and carbon dioxide fire extinguishers will NOT extinguish burning propellant of the type used in AEROTECH High-Power Rocket Motors.

MOTOR PERFORMANCE DATA

MOTOR TYPE	PROPELLANT WEIGHT		TOTAL IMPULSE (TYP)		AVERAGE THRUST	
	oz.	gms	lb.-sec	N-sec.	lbs.	N
G142	1.36	38.6	18.9	84	31.9	142

TYPICAL TIME-THRUST CURVE



High Power Safety Code of the National Association of Rocketry

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 at least one half the minimum launch site dimension, or 1500 feet (whichever is greater) 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.

MINIMUM DISTANCE TABLE

Installed Total Impulse (Newton-Seconds)	Equivalent High Power Motor Type	Minimum Diameter of Cleared Area (ft.)	Minimum Personnel Distance (ft.)	Minimum Personnel Distance (Complex Rocket) (ft.)
0 -- 320.00	H or smaller	50	100	200
320.01 -- 640.00	I	50	100	200
640.01 -- 1,280.00	J	50	100	200
1,280.01 -- 2,560.00	K	75	200	300
2,560.01 -- 5,120.00	L	100	300	500
5,120.01 -- 10,240.00	M	125	500	1000
10,240.01 -- 20,480.00	N	125	1000	1500
20,480.01 -- 40,960.00	O	125	1500	2000

Note: A Complex rocket is one that is multi-staged or that is propelled by two or more rocket motors.

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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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