

## Chapter 2. Liner & Case Assembly (Cont'd)

- 2-16. **Fig-18:** Place the greased forward (1/8" thick X 2-3/4" O.D.) O-ring into the forward (bulkhead) end of the case until it is seated against the forward seal disk.
- 2-17. **Fig-19:** Thread the forward closure assembly into the forward end of the motor case by hand until it is seated against the case.
- 2-18. **Fig-20:** Place the motor assembly in a horizontal position. Place the greased aft (1/8" thick X 2-3/4" O.D.) O-ring into the groove around the nozzle.
- 2-19. **Fig-21:** Thread the aft closure into the aft end of the motor case by hand until it is seated against the case. **NOTE:** There will be considerable resistance to threading in the closure during the last 1/8" to 3/16" of travel. It is normal if a slight (1/16" to 3/32") gap remains between the closure and the case after tightening.



Fig-18



Fig-19



Fig-20



Fig-21

## Chapter 3. Preparation For Flight

- 3-1. Insert the coated end of a Firestar™ or other igniter through the nozzle throat, aligned with the offset "moon" core, until it stops against the forward seal disk.
- 3-2. Secure the igniter to the nozzle with a piece of masking tape.
- 3-3. Install the motor into the rocket's motor mount tube. Ensure that the motor is securely retained in the rocket by using positive mechanical means to prevent it from being ejected during recovery system deployment.
- 3-4. Prepare the rocket's recovery system and then launch the rocket in accordance with the Tripoli Rocketry Association (TRA) Safety Code and National Fire Protection Association (NFPA) Code 1122.

## Chapter 4. Post-Recovery Cleanup

**NOTE:** Perform motor clean-up as soon as possible after motor firing. Propellant and delay residues become difficult to remove after 24 hours and can lead to corrosion of the metal parts. Place the spent motor components in the reload kit plastic bags and boxes and dispose of properly.

- 4-1. After the motor has cooled down, unthread and remove the forward and aft closures.
- 4-2. Remove the smoke charge insulator from the forward closure and discard. Using wet wipes or damp paper towels, remove all delay and propellant residue from the closures.
- 4-3. Remove and discard the forward and aft O-rings from the motor case. Remove the liner, forward seal disk and nozzle from the casing by pushing on the seal disk end. Remove the forward seal disk from the liner, and remove and discard the forward seal O-ring. **DO NOT DISCARD THE FORWARD SEAL DISK!** Using wet wipes or damp paper towels, wipe the inside of the casing and forward seal disk to remove all propellant residue.
- 4-4. Apply a light coat of grease to all threads and the inside of the motor case. Reassemble metal parts and store motor in a dry place.

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## Chapter 5. 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/RCS composite propellant consists primarily of ammonium perchlorate and a rubber-like plastic elastomer.

## Chapter 6. Disposal

Damaged or defective reload kits should be returned to RCS.

## Chapter 7. Fire Safety

Tests show that the pyrotechnic components of RMS™ reload kits will not explode in fires and normally will not ignite unless subjected to direct flame and then will burn slowly. Use water to fight any fires in which AeroTech/RCS RMS™ reload kit pyrotechnic components may become involved. Direct the water at the AeroTech/RCS RMS™ reload kit pyrotechnic components to keep them below their 550 deg. F autoignition temperature. Foam and carbon dioxide fire extinguishers will NOT extinguish burning propellants of the type used in RMS™ reload kit pyrotechnic components. Keep reload kit pyrotechnic components away from flames, sources of heat and flammable materials.

## Disclaimer and Warranty

**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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**AEROTECH**  
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Division of RCS Rocket Motor Components, Inc.

# HIGH-POWER RMS™

## Reloadable Motor System™

### RMS™ 75/7680 White Lightning™

**This Package Contains One Reload Kit:**

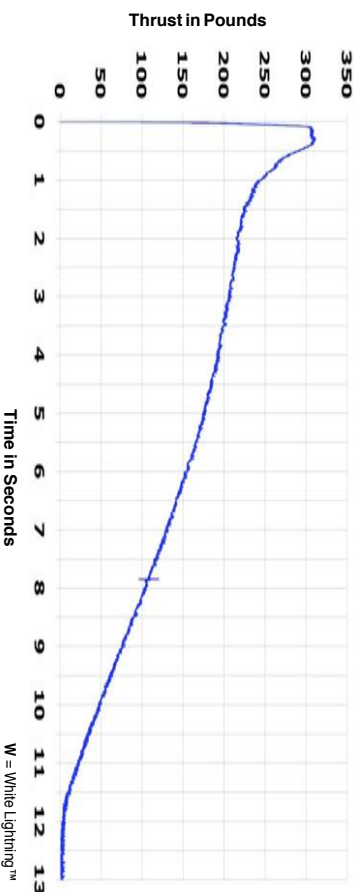
M685W-P (75/7680)

**NOTE:** This reload kit **MUST** be used with separately packaged M685W propellant grains (5 X P/N 03627 & 1 X P/N 03627-1) and motor liner tube (P/N 03035-6). RMS™-75 reload kits do not include an ejection charge. RMS™-75 motors must be used in conjunction with a timer, altimeter or radio-actuated recovery system.

**NOTE:** This reload kit is **ONLY** for use in AeroTech/RCS, Dr. Rocket™ or Rouse-Tech™ RMS™ 75mm high-power motor hardware. Certified by the Tripoli Rocketry Association (TRA).

**DO NOT OPEN RELOAD KIT UNTIL READY TO USE**

## Typical Time-Thrust Curve:



## RMS™ 75/7680 White Lightning™ Reload Kit Data

Hardware Designation	Performance Designation	Total Impulse (Typical)	Propellant Weight	Loaded Motor Weight
RMS™-75/7680	M685W-P	7,741 N-sec	4,176 g (9.21 lb)	6,880 g (15.17 lb)

## RMS™ 75mm Hardware Data

Hardware Designation	Motor Diameter	Motor Length	Hardware Weight	Reload Used
RMS™-75/7680	2.965" (75mm)	36.36"	1,910 g (4.21 lb)	M685W-P

**NOTE:** Motor lengths are measured from end of aft closure to end of forward closure.

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

## READ THIS BEFORE YOU BEGIN

- **SAFETY:** This is a high speed rotating assembly. THE DIRECTION OF ASSEMBLY IS EXTREMELY IMPORTANT. READ ALL INSTRUCTIONS BEFORE USE. USE ONLY APPROVED AND RELIABLE RMS™ PARTS AND ACCESSORIES. ALWAYS WEAR YOUR SAFETY GOGGLES AND PROTECTIVE GEAR. ALWAYS WEAR YOUR SAFETY GOGGLES AND PROTECTIVE GEAR. ALWAYS WEAR YOUR SAFETY GOGGLES AND PROTECTIVE GEAR. ALWAYS WEAR YOUR SAFETY GOGGLES AND PROTECTIVE GEAR.
- **DO NOT MODIFY ANY PARTS OF THE RMS™.** ANY MODIFICATION WILL VOID THE WARRANTY. CONTACT US AT 1-800-451-7438 or email at [service@high-power-rms.com](mailto:service@high-power-rms.com).
- **DO NOT MODIFY THE MOTOR OR ANY PART.** Modification of the motor or the wheel is strictly prohibited. Do not modify the motor or the wheel in any way. Do not modify the motor or the wheel in any way. Do not modify the motor or the wheel in any way.
- **USE ONLY APPROVED RMS™ RELIABLE RMS™ PARTS AND ACCESSORIES TO REPAIR YOUR RMS™ MOTOR.** The manufacturer does not have any responsibility for any modifications made to the motor or the wheel. Do not modify the motor or the wheel in any way. Do not modify the motor or the wheel in any way.
- **DO NOT REMOVE ANY OF THE DISMOUNTABLE PARTS OF THE RMS™ RELIABLE RMS™.** This includes the bearings and the wheels. These components have been designed to be used together and should not be separated. Do not remove any of the parts of the RMS™.
- **Wash up after you try.** Although the RMS™ operates at low temperatures the high speed rotation, the high torque capability of the aluminum motor parts may lead to some overheating. It is necessary to wash your hands after the motor has cooled to a safe level.
- **Never use the safety side of the Top Flange Assembly (TFA) and only with a battery, and not use it at activities involving high speed rotation.**

## Chapter 1. Nervous Chassis Assembly

- 3-1. **Fig-1:** NOTE: Motor harness shown in photo, but assembly process is the same for this motor. Apply a light coat of Super Lube™ or other grease to all threads, sealing surfaces and o-rings. This will facilitate assembly and prevent the threads from seizing.  
- 3-2. **Fig-2:** Insert the smoke change element into the smoke change insulator until it is flush with both ends of the insulator. 
- 3-3. **Fig-3:** Apply a liberal amount of grease to one end of the smoke change element and the outside of the smoke change insulator. 
- 3-4. **Fig-4:** Insert the greased end of the smoke change assembly into the smoke change cavity of the forward closure until it is seated against the forward end of the cavity. Set the compressed forward closure assembly aside. 
- 3-5. **Fig-5:** Dispense approximately 20 grams of 15 or 30 minute epoxy and mix thoroughly. 
- 3-6. **Fig-6:** Apply epoxy to one end of the 1" (left chamfered) 8.2" grain. NOTE: The chamfered end of the 1" grain faces the nozzle and is not coated with epoxy. 

## Chapter 2. Liner & Case Assembly

- 2-3. **Fig-8:** Stack the 1" & 2" grains together with the exposed ends facing each other and be sure in visual alignment. NOTE: The chamfered end of the 1" grain should be facing the table surface. 
- 2-4. **Fig-9:** Repeat steps 2-1 through 2-3 for the 3" and 4", and the 5" and 6" grains. You should now have three (3) sets of two (2) grains, each bonded together. Allow to cure completely before proceeding to the next step. 
- 2-5. **Fig-10:** Mix and apply epoxy to the top surface of the 2" unretained grain, then slide the liner over the top exposed grain. 
- 2-6. **Fig-11:** Insert the nozzle into the all (left) retained grain end of the liner. NOTE: The all grain spacer being shown in the photo is not used with this retinal. 
- 2-7. **Fig-12:** Insert the liner assembly into the nozzle. Ensure that the nozzle flange is seated against the end of the liner. 
- 2-8. **Fig-13:** Mix and apply epoxy to both ends of the 3" and 4" grain stack. Note: (5) right grain shown in Fig. 10 and Fig. 12. 
- 2-9. **Fig-14:** Drop the 3" and 4" grain stack into the liner until seated against the 1" and 2" grain stack with their cones in visual alignment, then insert a wood dowel into the cone and wiggle around to align the cones. Allow the epoxy to cure before proceeding with step 2-12. 
- 2-10. **Fig-15:** Mix and apply epoxy to both ends of the 5" and 6" grain stack. 
- 2-11. **Fig-16:** Drop the 5" and 6" grain stack into the liner, until it is seated against the 3" and 4" grain stack with their cones in visual alignment, then insert the wood dowel into the cone and wiggle around to align the cones. Allow the epoxy to cure before proceeding with step 2-12. 
- 2-12. **Fig-17:** Place the greased forward seal disk o-ring (3" 30" thick X 2.6" O.D.) into the groove in the forward seal disk. 
- 2-13. **Fig-18:** Insert the reduced diameter (o-ring) end of the seal disk assembly into the open end of the liner until seated and flush. 
- 2-14. **Fig-19:** Apply a liberal amount of grease to the upper 2" - 3" of the liner and the top surface of the forward seal disk. 
- 2-15. **Fig-20:** Slide the motor assembly over the liner. 

## DO NOT OPEN RELOAD KIT UNTIL READY TO USE

### PARTS:

- 1 20mm standard or enlarged all closure
  - 1 20mm case
  - 1 20mm plugged forward closure
  - 1 20mm forward seal disk
- RELOAD KIT**
- 1 Nozzle (black plastic part)
  - 1 Liner (3-3/4" O.D. black plastic tube)
  - 1 All (right) grain (10" dia. plastic "toaster" cone)
  - 1 Forward retained grain (7" dia. "toaster" cone)
  - 1 Part & all o-ring (1.8" thick X 3-3/4" O.D.)
  - 1 Smoke change grain (1.3" long, 1.3" dia. part)
  - 1 Smoke change insulator (1.1" O.D. tube)
  - 1 Forward seal disk o-ring (3.0" thick X 3-3/4" O.D.)

### ITEMS NEEDED FOR USE:

- 15 or 30-minute epoxy resin
- Super Lube™, Super Lube™ or other grease
- 1.0" - 1.8" diameter wooden dowel
- Electric match, matches, lighter or other igniter
- Smoking pipe
- Wet wipes or damp paper towels

## SAVE THE RELOAD KIT PLASTIC BAG AND GRAIN BOXES FOR THE USED RELOAD KIT. DISPOSE OF BAG, BOXES AND PARTS PROPERLY.