## High-Power RMS™ Assembly and Operation Instructions

**READ THIS BEFORE YOU BEGIN:**

- **DO NOT OPEN RELOAD KIT UNTIL READY TO USE.**
- **PARTS:**
  - RMS™-98 HARDWARE
    - 98mm standard or enlarged aft closure
    - 98mm plugged forward closure
    - 98mm forward seal disk
  - RELOAD KIT
    - Nozzle (black plastic part)
    - Liner (3-5/8" O.D. black plastic tube)
    - Propellant grain (1-1/8" dia. chambered "moon" core)
    - Forward propellant grain (1-1/8" dia. "moon" core)
  - **ITEMS NEEDED FOR USE:**
    - 15 or 30-minute epoxy resin
    - Synco™ Super Lube™ or other grease
    - 3/8" - 1" diameter wooden dowel
    - Electric match with thermaflite, Firestar™ or other igniter
    - Masking tape
    - Wet wipes or damp paper towels

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### Chapter 1. Forward Closure Assembly

2-1. Fig.-1: Apply a light coat of Synco™ Super Lube™ or other grease to all threads, sealing surfaces and o-rings. This will facilitate assembly and prevents the threads from seizing.

2-2. Fig.-2: Insert the smoke charge element into the smoke charge insulator until it is flush with both ends of the insulator.

2-3. Fig.-3: Apply a liberal amount of grease to one end of the smoke charge element and the outside of the smoke charge insulator.

2-4. Fig.-4: Insert the greased end of the smoke charge assembly into the smoke charge cavity of the forward closure until it is seated against the forward end of the cavity. Set the completed forward closure assembly aside.

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### Chapter 2. Liner & Case Assembly

2-1. Fig.-5: Dispense approximately 20 grams of 15 or 30 minute epoxy and mix thoroughly.

2-2. Fig.-6: Stack the 1st & 2nd grains together with the epoxied ends facing each other and the cores in visual alignment. **NOTE:** The chamfered end of the aft (1st) grain should be facing the table surface.

2-3. Fig.-7: Mix and apply epoxy to the top surface of the 2nd (unchamfered) grain, then slide the liner over the two epoxied grains.

2-4. Fig.-8: Install the nozzle and grain spacer (3/16" thick X 3-3/8" O.D. o-ring) into the aft (chamfered grain) end of the liner. **NOTE:** Multi-throat Medusa™ nozzle shown in illustrations. The N1000W-P motor uses a single-throat nozzle.

2-5. Fig.-9: Stand the liner assembly on the nozzle. Ensure that the nozzle flange is seated against the end of the liner.

2-6. Fig.-10: Mix and apply epoxy to both ends of the 3rd and 4th grain stack. **Note:** Single grain shown in Fig. 10 and Fig. 12.

2-7. Fig.-11: Drop the 3rd and 4th grain stack into the liner until seated against the 1st and 2nd grain stack with their cores in visual alignment, then insert a wood dowel into the core and wiggle around to align the cores.

2-8. Fig.-12: Mix and apply epoxy to one end of the 5th and 6th grain stack.

2-9. Fig.-13: Drop the 5th and 6th grain stack into the liner, epoxy-coated end first, until it is seated against the 3rd and 4th grain stack with their cores in visual alignment, then insert the wood dowel into the core and wiggle around to align the cores.

2-10. Fig.-14: Place the greased forward seal disk o-ring (3/32" thick X 3-3/8" O.D.) into the groove in the forward seal disk.

2-11. Fig.-15: Install the reduced diameter (o-ring) end of the seal disk assembly into the open end of the liner until seated and flush.

2-12. Fig.-16: Apply a liberal amount of grease to the upper 2" - 3" of the liner and the top surface of the forward seal disk.

2-13. Fig.-17: Slide the motor casing over the liner.
Chapter 2. Liner & Case Assembly (Cont’d)

2-16. Fig.-18: Place the greaseforward (3/16" thick X 3-5/8" 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 (3/16" thick X 3-5/8" 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. 

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 1127.

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 disk 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.

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 rocket in accordance with the Tripoli Rocketry Association (TRA) Safety Code and National Fire Protection Association (NFPA) Code 1127.

Disclaimer and Warranty

NOTE: 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 therefore 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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