



# IRON MAN

## Heavy Lift Launch Vehicle

Includes the revolutionary new **FX System™** with:

- Interchangeable engine mounts.
- Pre-lift-off smoke.

### Product No. LS 100

Model kit requires assembly. Recommended for ages 10 to adult. Adult supervision recommended for ages 12 years and under.



#### TECHNICAL PROFILE

- SKILL LEVEL:** THREE - Advanced
- LENGTH:** 24 inches
- DIAMETER:** 2.0 inches
- WEIGHT:** 4.0 ounces
- RECOMMENDED ENGINES:** C6-3 D12-5
- FX** (use with C6-3 or D12-5)

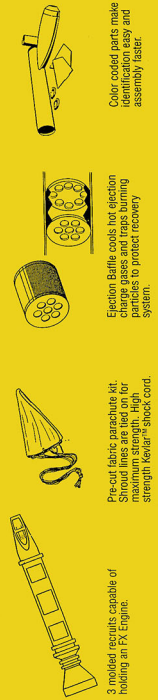
#### FX System™

The interchangeable engine mounts included in this kit allow you the optimum choice of engine type based on your available flying area, altitude desired, or visual effect you are looking for - with a simple twist of the mount.



#### EXCELLENCE IN PRODUCT ENGINEERING AND DESIGN.

These are just some of the features included in each kit that set Concept II products apart from the rest.



3 molded recruits capable of holding an FX Engine.

Pre-cut fabric parachute kit. Shroud lines are tied on for strength versus shock cord.

Ejection Baffle cools for ejection charge gases and traps burning embers to protect recovery system.

Color coded parts make identification easy and assembly faster.

# IronMan

Prod. No LS-100

Skill Level Three: Advanced

## SAFETY INSTRUCTIONS

For the safe and reliable performance of your model rocket  
PLEASE NOTE:

1. Model rockets are not "toys" - that they are capable of causing personal injury to you and to others as well as property damage.
2. That you and you alone are responsible for the safe operation of your rocket.
3. That you must properly build and operate your rocket with a clear sense of that responsibility; that means taking no chances or risks which might endanger yourself or others.
4. Read and observe the rules of the Model Rocket Safety Code printed on this sheet.

## HELPFUL HINTS

Before building this kit gather the necessary tools and materials and read all instructions thoroughly. In addition, keep the following points in mind.

1. Read and understand each step and study the drawings before beginning any part in that step.
2. Always test fit the parts before putting glue on them.

## TOOLS REQUIRED

1. Modeling knife
2. #00 grit sandpaper
3. Pencil
4. Ruler

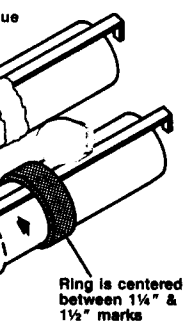
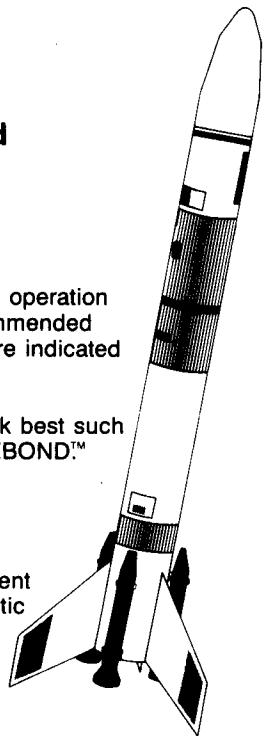
## GLUES REQUIRED

Proper glue joints are vital for the safe operation of your model rocket. Use these recommended glues or glues of similar qualities where indicated in these instructions.

**White Glue** - Aliphatic resin glues work best such as PACTRA TUBE O'PHATIC™ or TITEBOND™

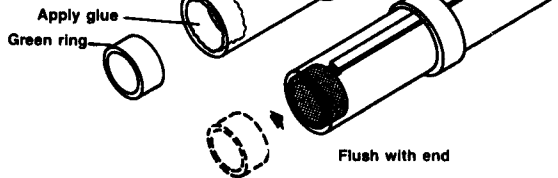
**Cyanoacrylate** - Medium or slow viscosity.

**Liquid Solvent Plastic Cement** - Solvent cements that chemically bond the plastic together such as WELD-ON™ Acrylic plastic cement, MICRO-WELD™ or TESTORS™ liquid plastic cement.



### STEP THREE.

- A. Apply a small ring of white glue around inside of yellow tube as shown.
- B. Insert one of the green engine block rings until it is flush with the end of the yellow tube. Wipe away any excess glue.



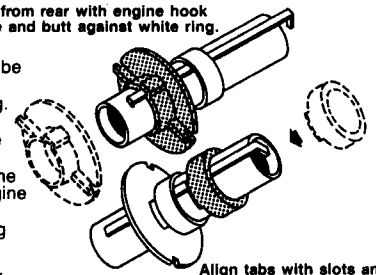
Ring is centered between 1/4" & 1/2" marks

### STEP FOUR.

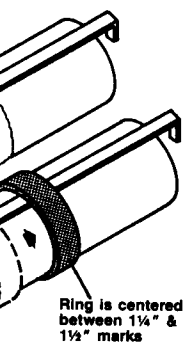
- A. Slide the plastic single engine mount plate onto the yellow tube from the rear as shown until it butts up against the white ring.
- B. Slide one of the plastic single engine snap rings on from the front of the yellow tube.
- C. Align the two snap tabs with the corresponding slots in the engine mount plate and snap the two plastic parts together centering them over the white ring.

For maximum strength and safety re-inforce all plastic to plastic and plastic to paper joints with Cyanoacrylate type glue.

Slide on from rear with engine hook in groove and butt against white ring.

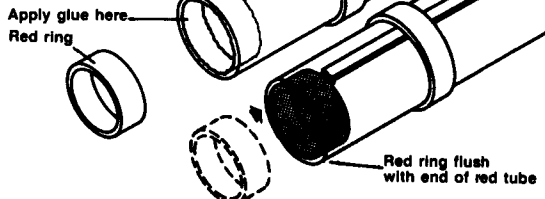


If engine mount plate fits too tight - sand inside edges to loosen fit.



### STEP THREE.

- A. Apply a small ring of white glue around inside of red tube as shown.
- B. Insert the red engine block ring until it is flush with the end of the red tube. Wipe away any excess glue.



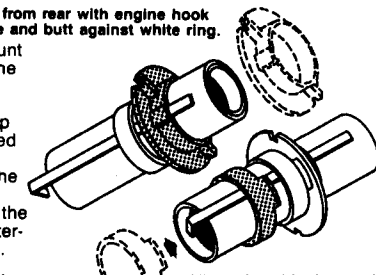
Ring is centered between 1/4" & 1/2" marks

### STEP FOUR.

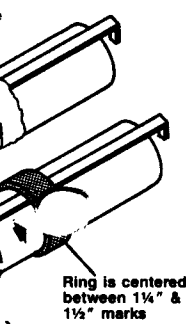
- A. Slide the plastic D engine mount plate onto the red tube from the rear as shown until it butts up against the orange ring.
- B. Slide the plastic D engine snap ring on from the front of the red tube.
- C. Align the two snap tabs with the corresponding slots in the D engine mount plate and snap the two plastic parts together centering them over the orange ring.

For maximum strength and safety re-inforce all plastic to plastic and plastic to paper joints with Cyanoacrylate.

Slide on from rear with engine hook in groove and butt against white ring.

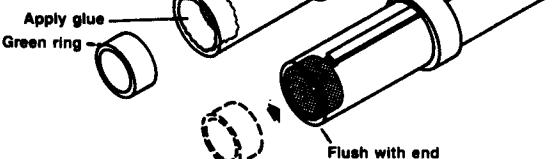


If D engine mount plate fits too tight - sand inside edges to loosen fit



### STEP THREE.

- A. Apply a small ring of white glue around inside of yellow tube as shown.
- B. Insert one of the green engine block rings until it is flush with the end of the yellow tube. Wipe away any excess glue.



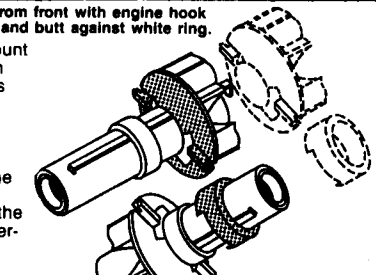
Ring is centered between 1/4" & 1/2" marks

### STEP FOUR.

- A. Slide the plastic FX engine mount plate onto the yellow tube from the front as shown until it butts up against the white ring.
- B. Slide one of the plastic single engine snap rings on from the rear of the yellow tube.
- C. Align the two snap tabs with the corresponding slots in the FX engine mount plate and snap the two plastic parts together centering them over the white ring.

For maximum strength and safety re-inforce all plastic to plastic and plastic to paper joints with Cyanoacrylate type glue.

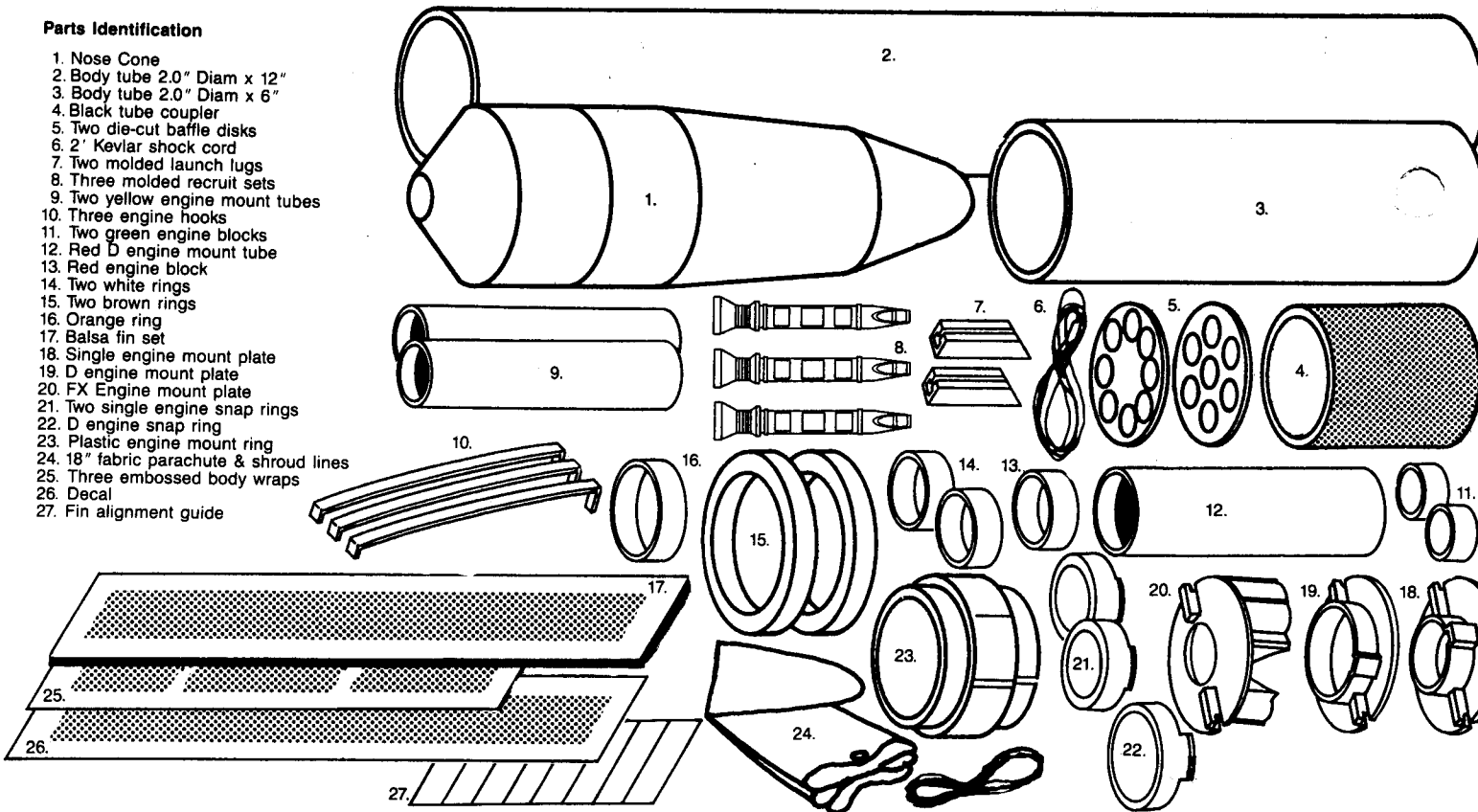
Slide on from front with engine hook in groove and butt against white ring.



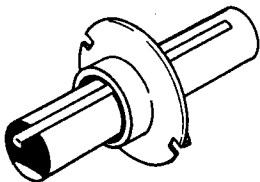
If engine mount plate fits too tight - sand inside edges to loosen fit.

**Parts Identification**

1. Nose Cone
2. Body tube 2.0" Diam x 12"
3. Body tube 2.0" Diam x 6"
4. Black tube coupler
5. Two die-cut baffle disks
6. 2' Kevlar shock cord
7. Two molded launch lugs
8. Three molded recruit sets
9. Two yellow engine mount tubes
10. Three engine hooks
11. Two green engine blocks
12. Red D engine mount tube
13. Red engine block
14. Two white rings
15. Two brown rings
16. Orange ring
17. Balsa fin set
18. Single engine mount plate
19. D engine mount plate
20. FX Engine mount plate
21. Two single engine snap rings
22. D engine snap ring
23. Plastic engine mount ring
24. 18" fabric parachute & shroud lines
25. Three embossed body wraps
26. Decal
27. Fin alignment guide

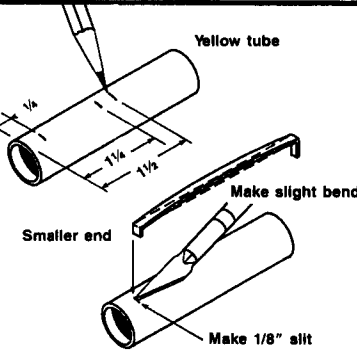


**Single TRACKER Engine Mount**



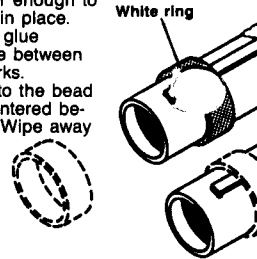
**STEP ONE.**

- A. Mark one of the yellow engine mount tubes  $\frac{1}{4}$ ",  $1\frac{1}{4}$ ", and  $1\frac{1}{2}$ " from one end.
- B. Cut a  $\frac{1}{8}$ " slit in the tube at the  $\frac{1}{4}$ " mark.
- C. Put a slight bend in one of the engine hooks.
- D. Make a note that the engine hook has one end larger than the other. Insert the smaller sized end of the hook into the slit as shown.

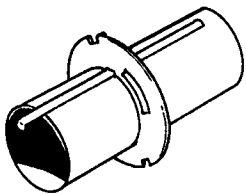


**STEP TWO.**

- A. Slide one of the white rings onto the yellow tube just far enough to hold the engine hook in place.
- B. Apply a bead of white glue around the yellow tube between the  $\frac{1}{4}$ " and  $1\frac{1}{2}$ " marks.
- C. Slide the white ring into the bead of glue so that it is centered between the two marks. Wipe away any excess glue.

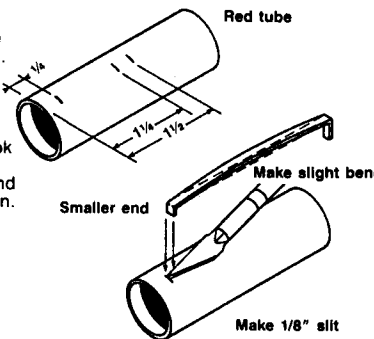


**D Size Engine Mount**



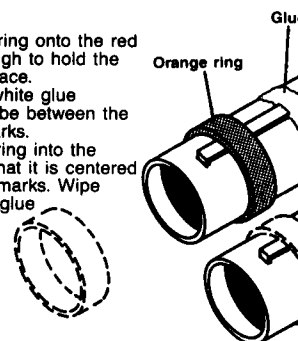
**STEP ONE.**

- A. Mark the red engine mount tube  $\frac{1}{4}$ ",  $1\frac{1}{4}$ ", and  $1\frac{1}{2}$ " from one end.
- B. Cut a  $\frac{1}{8}$ " slit in the tube at the  $\frac{1}{4}$ " mark.
- C. Put a slight bend in one of the engine hooks.
- D. Make a note that the engine hook has one end larger than the other. Insert the smaller sized end of the hook into the slit as shown.

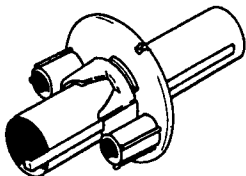


**STEP TWO.**

- A. Slide the orange ring onto the red tube just far enough to hold the engine hook in place.
- B. Apply a bead of white glue around the red tube between the  $\frac{1}{4}$ " and  $1\frac{1}{2}$ " marks.
- C. Slide the orange ring into the bead of glue so that it is centered between the two marks. Wipe away any excess glue.

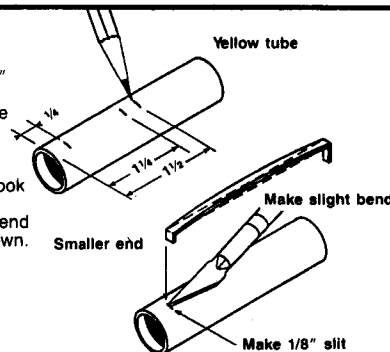


**FX Engine Mount**



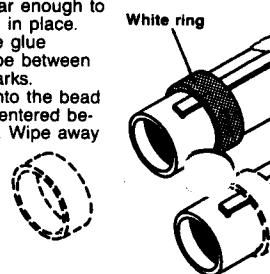
**STEP ONE.**

- A. Mark one of the yellow engine mount tubes  $\frac{1}{4}$ ",  $1\frac{1}{4}$ ", and  $1\frac{1}{2}$ " from one end.
- B. Cut a  $\frac{1}{8}$ " slit in the tube at the  $\frac{1}{4}$ " mark.
- C. Put a slight bend in one of the engine hooks.
- D. Make a note that the engine hook has one end larger than the other. Insert the smaller sized end of the hook into the slit as shown.



**STEP TWO.**

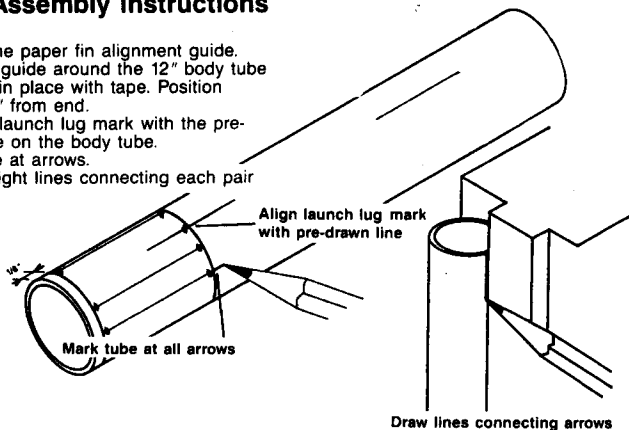
- A. Slide one of the white rings onto the yellow tube just far enough to hold the engine hook in place.
- B. Apply a bead of white glue around the yellow tube between the  $\frac{1}{4}$ " and  $1\frac{1}{2}$ " marks.
- C. Slide the white ring into the bead of glue so that it is centered between the two marks. Wipe away any excess glue.



## Rocket Assembly Instructions

### STEP ONE.

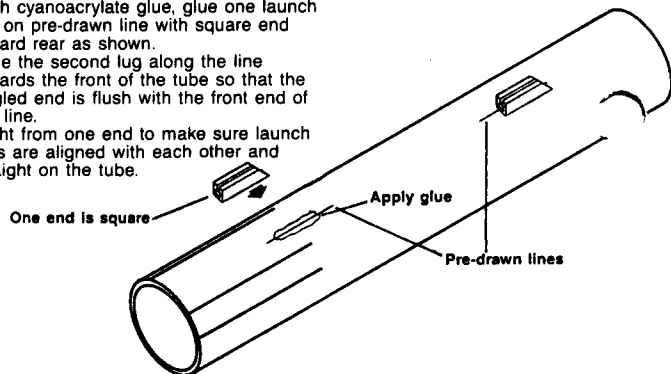
- Cut out the paper fin alignment guide.
- Wrap the guide around the 12" body tube and hold in place with tape. Position guide 1/8" from end.
- Align the launch lug mark with the pre-drawn line on the body tube.
- Mark tube at arrows.
- Draw straight lines connecting each pair of marks.



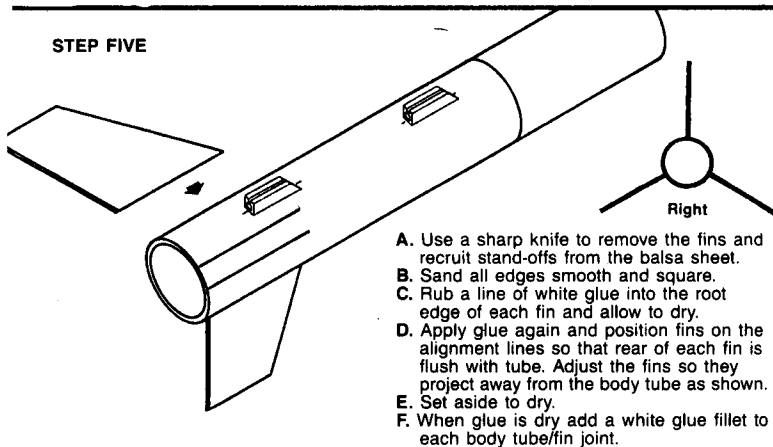
### STEP TWO

Note that one end of each molded launch lug is square and the other angled.

- With cyanoacrylate glue, glue one launch lug on pre-drawn line with square end toward rear as shown.
- Glue the second lug along the line towards the front of the tube so that the angled end is flush with the front end of the line.
- Sight from one end to make sure launch lugs are aligned with each other and straight on the tube.

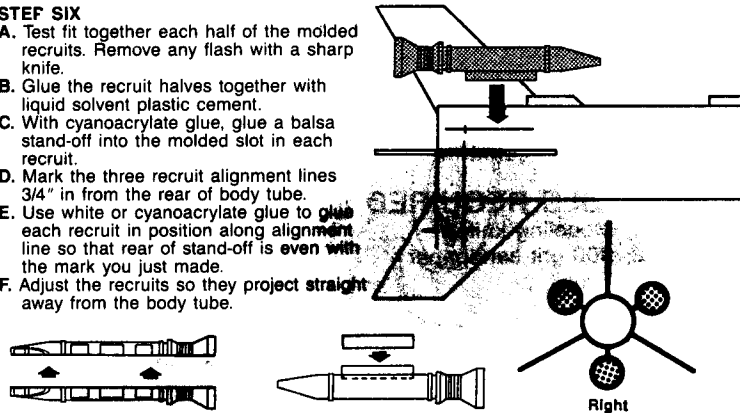


### STEP FIVE



### STEP SIX

- Test fit together each half of the molded recruits. Remove any flash with a sharp knife.
- Glue the recruit halves together with liquid solvent plastic cement.
- With cyanoacrylate glue, glue a balsa stand-off into the molded slot in each recruit.
- Mark the three recruit alignment lines 3/4" in from the rear of body tube.
- Use white or cyanoacrylate glue to glue each recruit in position along alignment line so that rear of stand-off is even with the mark you just made.
- Adjust the recruits so they project straight away from the body tube.



## Painting your rocket

A good paint job on your model will greatly enhance the way it looks and add to the realism of the **FX System** pre-lift-off smoke.

Apply sanding sealer to all balsa surfaces. Allow to dry and sand lightly. Repeat sealing and sanding until all balsa grain is filled and smooth.

Priming your rocket with a spray primer and then sanding before painting will fill the seams on the body tube and produce a very professional looking finish on your rocket.

Paint the entire model gloss white. Paint the upper 6" body section and all three recruits gray.

We recommend the following colors:

Pactra Astro Color™  
 Rocket Paint:  
 AC511 DELTA WHITE  
 AC519 VIKING GRAY

Pactra Sanding Sealer in spray or brush on.

Follow the instructions on each can for best results.

## Applying Decals

Let paint dry overnight before applying decals. Refer to the front panel of this package for proper placement.

Apply the silver embossed body wraps where shown. Peel the paper backing off and carefully stick one end down on the tube. Check that it is straight along tube before wrapping all the way around tube.

To apply decals, cut each out, dip in lukewarm water for 30 seconds or until it uncurls. Slip decal off backing sheet and onto model. Blot away excess water.

## Flying Your Rocket

### Pre-flight preparation

- Always inspect your rocket before each flight for any damage that may have occurred from its previous flight or during storage.
- The ejection baffle system in your rocket eliminates the need to use any recovery wadding.
- Carefully pack the parachute into the rocket and replace the nose cone. Check fit of nose cone to be sure it is loose.

### Engine Mount Installation

The three interchangeable engine mounts included in this kit allow you the optimum choice of engine types used based on your available flying area, altitude desired, or visual effect you are looking for.

To insert any of the mounts, make note that there are two molded tabs on each engine mount plate. These tabs lock over two corresponding ridges inside the plastic fin mount ring. The parts may fit very tightly the first few times you attempt installation. Gently work the parts back and forth a few times to loosen them up. For maximum safety do not attempt to alter the fit by sanding or removing any plastic with a knife. The fit should remain fairly tight to prevent the engine's ejection charge from blowing the mount out the rear of the rocket.

### To install:

- NOTE:** The mounts have more strength and are easier to grip with an engine installed. Install an engine without the igniter in place during insertion or removal of mount.
- Simply insert the engine mount with the tabs aligned and twist clockwise firmly. Mount should travel about 1/4" to fully lock.
  - Pull on the mount gently to be sure it is seated properly.
  - Install the igniter as per the instructions included.

### To remove:

- Wait until the engine is cool enough to touch by hand (usually two or three minutes).
- Twist engine mount counter-clockwise and pull.

**WARNING:** Do not attempt to remove engine mount with pliers while engine is still hot. This can result in permanent damage to your engine mount.

### RECOMMENDED ENGINES

First flight: C6-3

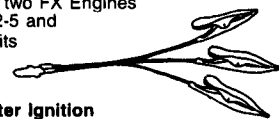
Large flying area: D12-5

Special visual effects:

- Use FX mount with C6-3 and two FX Engines
- Use D engine mount with D12-5 and FX Engines in each of the recruits

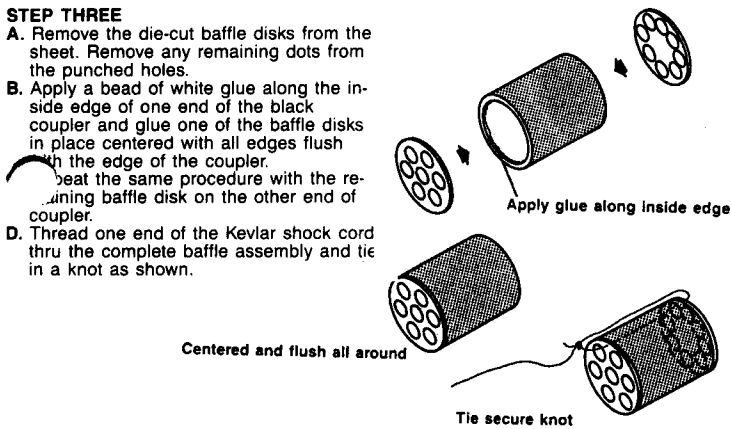
### NOTE: FX Engine Recruit Cluster Ignition

Because the distance between each of the recruits makes attaching a pair of normal micro clips very difficult, you will need a "clip whip" to enable you to grip all the igniter leads and distribute current evenly to each. You will need 6 micro clips and some 22 gauge wire to make two clips. Assemble each as shown here.



### STEP THREE

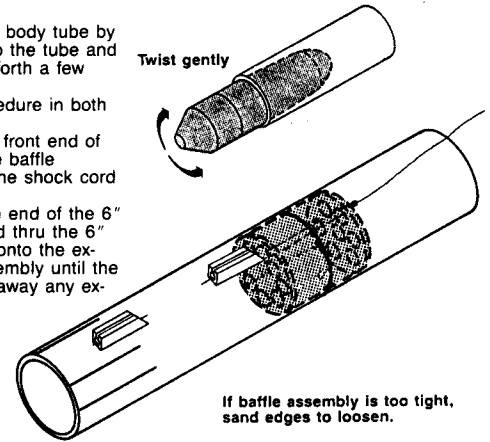
- A. Remove the die-cut baffle disks from the sheet. Remove any remaining dots from the punched holes.
- B. Apply a bead of white glue along the inside edge of one end of the black coupler and glue one of the baffle disks in place centered with all edges flush with the edge of the coupler.
- C. Repeat the same procedure with the remaining baffle disk on the other end of coupler.
- D. Thread one end of the Kevlar shock cord thru the complete baffle assembly and tie in a knot as shown.



### STEP FOUR

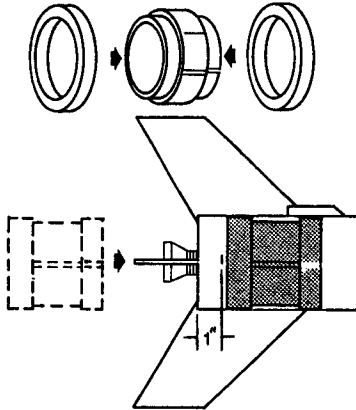
- A. Stretch the front end of the body tube by inserting the nose cone into the tube and gently twisting it back and forth a few times.
- B. Repeat this stretching procedure in both ends of the 6" tube.
- C. Apply white glue inside the front end of the 12" body tube and slide baffle assembly half way in with the shock cord facing forward.
- D. Apply white glue inside one end of the 6" tube. Thread the shock cord thru the 6" tube and slide the 6" tube onto the exposed section of baffle assembly until the two tube ends meet. Wipe away any excess glue.

Remove any flash from launch lugs with knife before gluing.



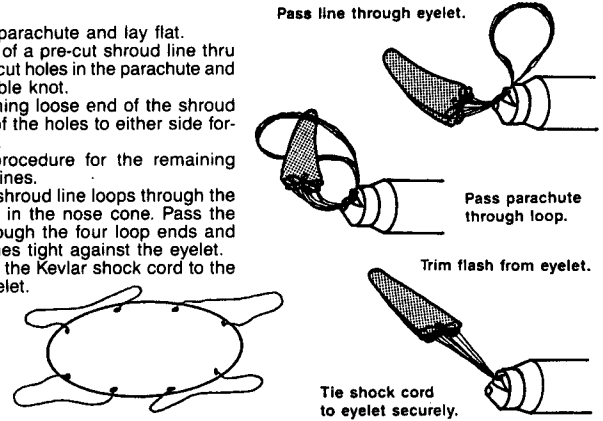
### STEP SEVEN

- A. Use cyanoacrylate glue to glue the large brown paper rings onto each end of the molded plastic engine mount ring.
- B. On the inside of body tube make a mark 1" in from rear edge.
- C. Note that on inside of molded plastic engine mount ring one end has three slots. THIS END MUST FACE FORWARD WHEN INSERTED IN TUBE.
- D. Apply a ring of white glue inside the body tube just past the 1" mark.
- E. The end with the three slots must be inserted first for the next step.
- F. In one quick motion, push the engine mount assembly into the body tube to the 1" mark.
- G. Apply a bead of glue around inside ring/tube joint.



### STEP EIGHT

- A. Unfold fabric parachute and lay flat.
- B. Pass one end of a pre-cut shroud line thru one of the pre-cut holes in the parachute and tie with a double knot.
- C. Tie the remaining loose end of the shroud line thru one of the holes to either side forming a "loop".
- D. Repeat this procedure for the remaining three shroud lines.
- E. Pass the four shroud line loops through the molded eyelet in the nose cone. Pass the parachute through the four loop ends and pull shroud lines tight against the eyelet.
- F. Tie free end of the Kevlar shock cord to the nose cone eyelet.



### Launch Procedure

1. Disarm the launch system by removing the safety key. Always be sure the key is in your possession when hooking the igniter leads up.
2. Slide the rocket down the guidance rail or rod of your launcher. Make sure the rocket slides freely.
3. Attach the micro-clips to the igniter wires. Arrange the clips so they do not touch each other or the metal blast deflector.
4. Move back from your rocket as far as the launch wire will permit (at least 15 feet).
5. Clear the launch area and follow all range safety procedures.
6. Arm the launch system by inserting the safety key.
7. Countdown to launch!
8. Remove safety key from system after successful launch.

Always follow the Model Rocket Safety Code when flying your rocket.

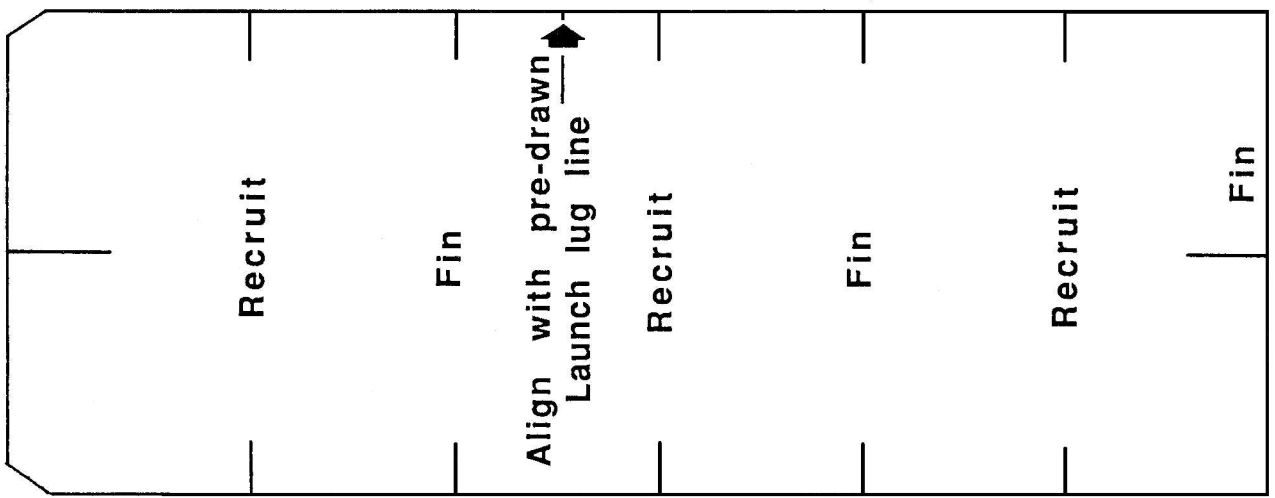
### MODEL ROCKET SAFETY CODE

1. **Construction**—My model rockets will be made of lightweight materials such as paper, wood, rubber, and plastic, without any metal as structural parts.
2. **Engines**—I will use only pre-loaded factory-made NAR Certified model rocket engines in the manner recommended by the manufacturer. I will not alter or dismantle model rocket engines or their ingredients in any way or attempt to reload these engines.
3. **Recovery**—I will always use a recovery system in my rockets that will return them safely to the ground so that they may be flown again. I will use only flame-resistant recovery wadding in my rockets.
4. **Weight Limits**—My model rocket will weigh no more than 1500 grams (53 ozs.) at lift off, and the engines will contain no more than 125 grams (4.4 ozs.) of propellant. My model rockets will weigh no more than the engine manufacturer's recommended maximum lift-off weight for the engines used or will use the engines recommended by the manufacturer for my rocket.
5. **Stability**—I will check the stability of my model rockets before their first flight, except when launching models of already proven stability.
6. **Payloads**—My model rockets will never carry live animals or payloads that are intended to be flammable or explosive.
7. **Launch Area**—I will launch my model rockets outdoors in a cleared area, free of tall trees, power lines, and buildings. I will ensure that people in the vicinity are aware of the pending rocket launch and are in a position to see the rocket's lift-off before I begin my audible 5-second countdown.
8. **Launcher**—I will launch my model rockets from a rod or other device which provides rigid guidance until the rocket has reached a speed adequate to ensure a safe flight path. To prevent accidental eye injury, I will always place the launcher so that the end of the rod is above eye level or will cap the end of the launch rod when approaching it. I will cap or disassemble my launch rod when not in use and will never store it in an upright position. The launch device will have a jet deflector to prevent the engine exhaust from hitting the ground directly. I will always clear the area around my launch device of brown grass, dry weeds, and other easy-to-burn materials.
9. **Ignition System**—The system I use to launch my model rockets will be remotely controlled and electrically operated and will contain a switch that will return to "off" when released. The system will contain a removable safety interlock in series with this firing switch. When launching, all persons will remain at least 15 feet away from any model rocket when igniting engines totalling 30 N-sec of total impulse or less and at least 30 feet when igniting engines totalling more than 30N-sec total impulse. I will use only electrical igniters which will ignite my rocket engine within one second of actuation of the launching switch.
10. **Launch Safety**—I will not let anyone approach a model rocket on a launcher until I have made sure that the safety interlock has been removed or the battery has been disconnected from my launcher. In the event of a misfire, I will wait one minute before allowing anyone to approach the launcher.
11. **Flying Conditions**—I will launch my model rocket only when the wind is less than 20 miles per hour, and under conditions where the model will not fly into clouds, fly near aircraft in flight, or be hazardous to people or property.
12. **Launch Area**—When conducting research activities with unproven designs or methods I will, when possible, determine their reliability through pre-launch tests. I will conduct launchings of unproven designs in complete isolation from persons not participating in the actual launching.
13. **Launch Angle**—I will not launch rockets so their flight path will carry them against targets. My launch device will be pointed within 30 degrees of vertical. I will never use model rocket engines to propel any device horizontally.
14. **Recovery Hazards**—If a model rocket becomes entangled in a power line or other dangerous place I will not attempt to retrieve it.

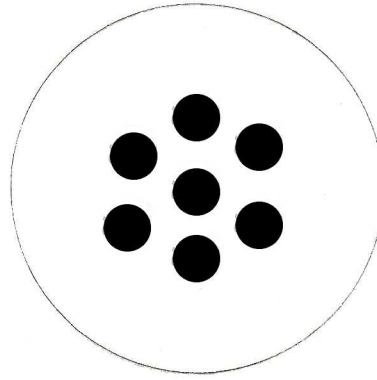
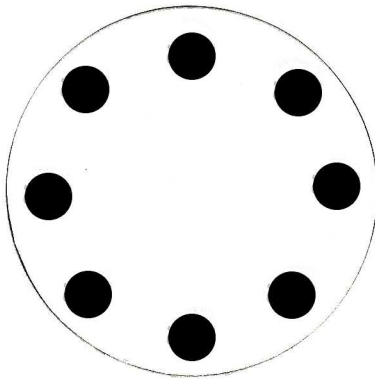
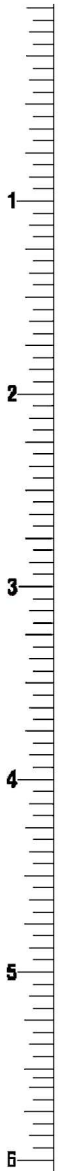


Model Rectifier Corporation  
200 Carter Drive  
Edison, New Jersey 08817

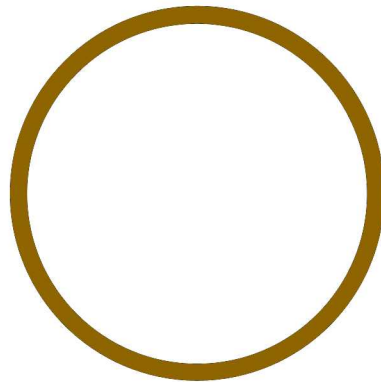
Model Rectifier Corporation © 1990



### FIN ALIGNMENT GUIDE

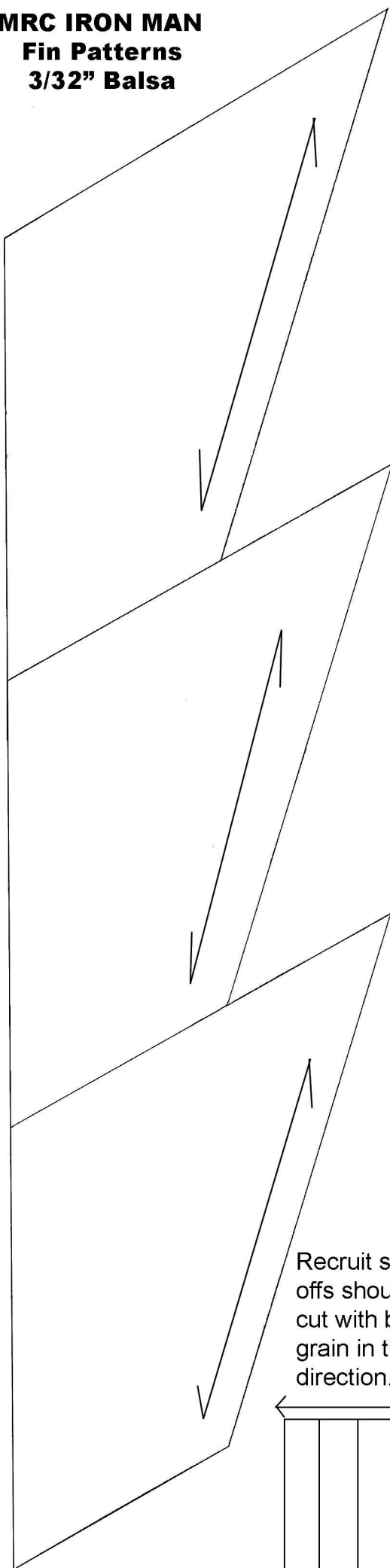


Centuri-style ejection baffle.

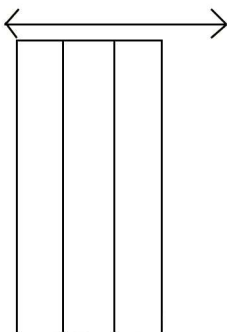


Centering rings for plastic motor mounts. (Need 2)

**MRC IRON MAN  
Fin Patterns  
3/32" Balsa**



Recruit stand-offs should be cut with balsa grain in this direction.





**MRC LS 100 Iron Man  
Silver Embossed Body Wraps**

