

INFORMATION ABOUT THE **ASTRON SPRITE**

The Design

Most model rockets require parachutes, streamers, or other drag members to break their aerodynamic stability during their descent. These systems usually work well, but they have some disadvantages. Parachutes and streamers add unnecessary bulk and weight. If the wind is blowing, a parachute rocket will end up a long way from the launch area. If trees are present any rocket which returns in two pieces connected by a string is apt to end up 40 feet off the ground looking like a fancy bird's nest.

The Astron Sprite is radically different in its design. Even though, at first thought, it might seem impossible to make a rocket fly upward and then refuse to fly down again, it can be done. This is where the Astron Sprite differs from most model rockets. It flies up and then comes tumbling down, head over heels, in one piece with no parachute to carry with the wind or catch in a tree. Read the enclosed technical report, No. TR-1, carefully. Then read the following paragraphs. You will not only learn how this rocket does the "impossible," but you will also learn one of the most important principles of all rocketry, large or small, regardless of the type of recovery system used.

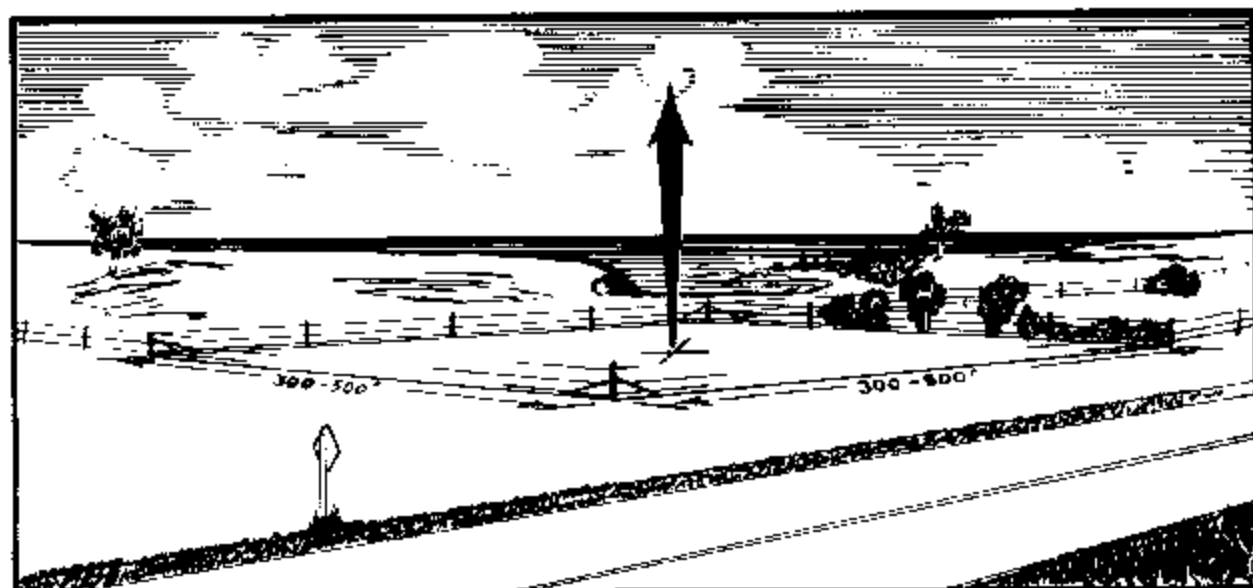
The Astron Sprite rocket is designed so that, in flight, the engine sits forward against the front of the engine holder. With the engine in this position the center of gravity is about 1/2" ahead of the center of pressure. According to the principles outlined in TR-1, the rocket will be stable and fly straight.

When the rocket reaches its peak altitude an ejection charge which is built into the engine is activated. This pressurizes the forward end of the rocket body and forces the expended engine casing rearward. The engine casing is caught by the rear hook of the engine holder and held in this position. This shifting of weight moves the center of gravity rearward approximately 5/8 inch so that the center of gravity is now behind the center of pressure. With the center of gravity behind the center of pressure the rocket can not fly straight and will return, tumbling, to a soft landing since the wind drag on an unstable object is extremely high.

Even if at first you do not understand this principle, your rocket will still perform correctly if you have built it according to the instructions. If you do understand it, you have learned one of the most important principles of all rocketry.

Flying the Bird

The best place to fly models is on a model rocket range. Many such ranges have been set up by organized groups of rocket enthusiasts. However, if such a range is not available it is best to select a place, free of trees and houses, large enough to recover the rocket within the area. Generally the field should be from 300 to 500 feet on a side. Launch the Astron Sprite from the center of the area as shown below.



For launching you may construct an ignition system of your own design or you may order one from Estes Industries or from the store where you purchased your rocket. The launching rod for the Astron Sprite must be at least 30" long.

If there is no model rocket club in your area and you would like to start one, Estes Industries will be glad to send you their Guide for Rocket Clubs, containing much helpful information on forming and operating a model rocket club. To obtain a copy, send a stamped, self-addressed envelope to Estes Industries, Inc., Box 227, Penrose, Colo., and request the Club Guide.

Launching

When setting the Astron Sprite on the launch pad make sure the engine is in its forward position. If the engine is not in its proper position the rocket may not be stable at takeoff. Much greater realism and safety are possible by launching the rocket electrically. To add to the realism, give a countdown: "Five... four... three... two... one... ignition!" The launch switch is pressed at "Ignition," and in a fraction of a second the rocket is zooming skyward. If a group is present a countdown is a must so others will know when the rocket is going to be launched.

Since the Astron Sprite lands harder than some rockets, it will be particularly ideal if the area is covered with grass. Occasionally the rocket may land on too hard a surface and break a fin. Broken fins can be reglued or replaced, however, and the rocket will be good as new.

Be sure all persons in the launching area and the recovery area are aware that you are going to launch a model rocket. Do not launch in picnic areas or other places where people are engaged in other recreations. Do not launch rockets in high winds or in the vicinity of low flying aircraft.

Engines to Use

The Astron Sprite is designed to be flown only with Series III engines manufactured by Estes Industries. The weight distribution (center of gravity—center of pressure relationship) of this rocket is very critical and other types of engines will not work. The types recommended are the 1/4A, 8-2S, 1/2A, 8-2S and 1/2A, 8-4S.

Changing Engines

Removal of the expended engine from the Astron Sprite is a simple matter of springing the rear end of the engine holder outward slightly to release the old engine. Make sure the paper cap from the old engine is removed before installing a new engine. If the cap is allowed to remain it will interfere with proper recovery system operation. Recovery system reliability will be improved if ejection charge residue is brushed out after each flight. An old tooth brush is a good tool for this and should become a permanent part of your range kit.

To insure proper fit of the new engine first see that it slides easily into place against the front end of the engine holder. Then make sure it can be expelled rearward by shaking the rocket. The engine should slide out of the body tube and stop against the rear of the engine holder.

Storage Care

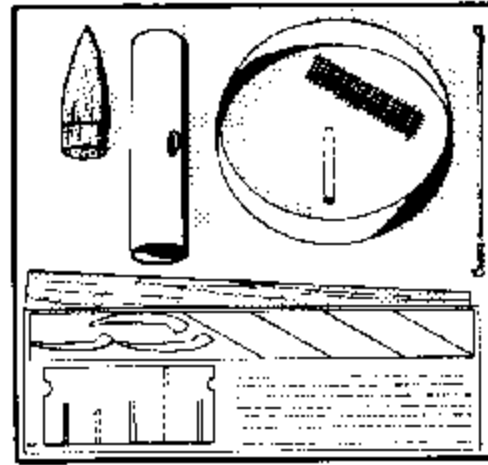
In a dry climate the rocket may be just set upon the shelf where it won't be knocked off on the floor or crushed. In humid climates it will be necessary to protect the rocket from moisture. It should always be kept in a dry place. If it is being stored for a long period under extremely high humidity it should be dried thoroughly and placed in a tightly closed polyethylene bag. The residue which builds up on the inside of the rocket body is hygroscopic and will become damp and sticky if exposed to excessive humidity.

Astron Sprite Assembly Instructions

BODY TUBE ASSEMBLY

Your Astron Sprite kit consists of the following materials as illustrated in the drawing on the right:

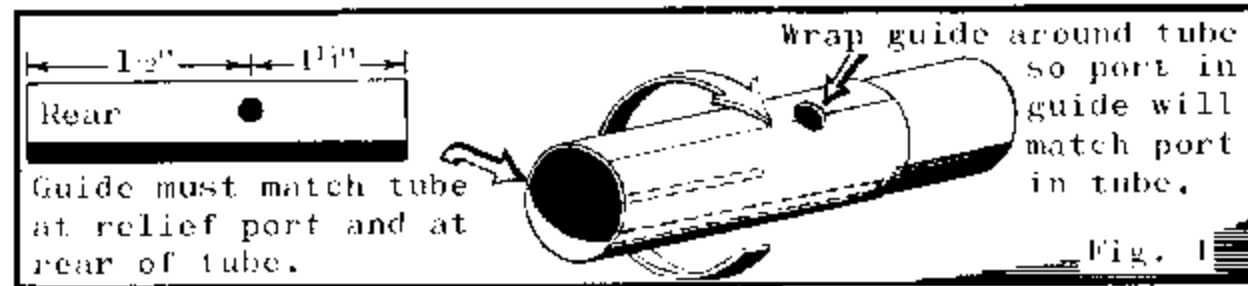
1 Balsa Nose Cone	Part #BNC-30D
1 Body Tube	Part #BT-30K
1 Fin Ring	Part #RT-70
1 Engine Holder	Part #EH-2
1 Balsa Fin Stock	Part #BFS-40S
1 Launching Lug	Part #LL-1A
1 Sheet Gauze Reinforcing	Part #GR-3
1 Fin Pattern Sheet	Part #SP-15



In addition to the parts included in the kit, you will need a sharp knife, white glue, one sheet each of fine and medium sandpaper, a pencil and scissors.

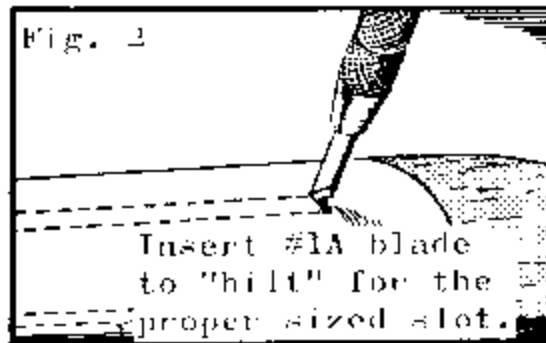
Check to be sure your kit is complete, then read the entire instructions before beginning construction.

1) Cut out the body tube marking guide and wrap it around the body tube so that the relief port on the guide matches the port in the body tube and the rear of the guide is even with the rear of the body tube. If the guide overlaps the end of the body tube by 1/4", turn the guide around—you've got it over the wrong end of the tube. Mark the body tube for fin, launching lug and engine holder positions as shown on the marking guide.

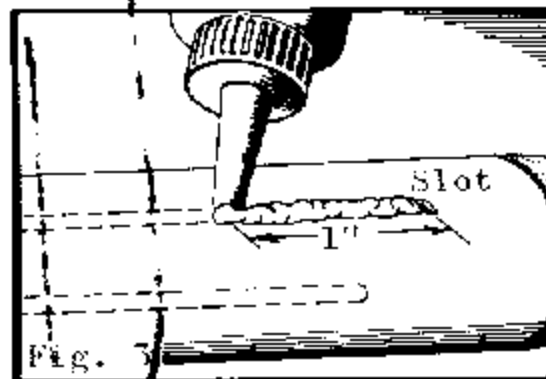


2) Place the nose cone in the forward end of the body tube and check the fit. If the shoulder of the nose cone is higher than the body tube, sand the entire nose cone until the body line is smooth from nose to tail. Remove the nose cone and smear glue around the inside of the body tube to a 1/2" depth. Insert the nose cone to its shoulder and wipe off any excess glue.

3) Cut a small slot in the body tube with the point of your model knife as shown in Fig. 2. The hole should be at the forward end of the engine holder position. The front end of the engine holder will reach through the hole to keep the engine in place during powered flight.

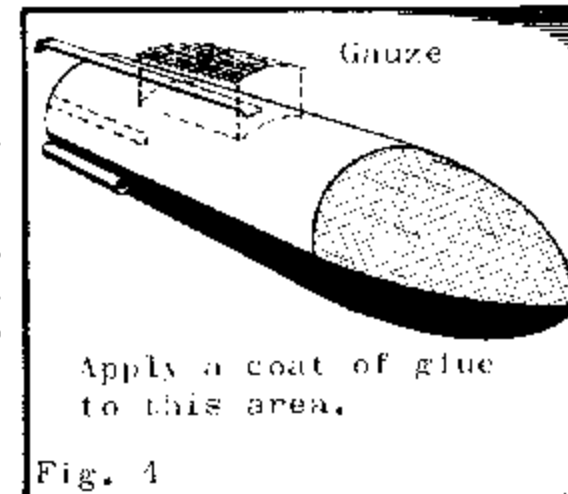


4) Apply a line of glue to the body tube along the line the engine holder will follow as shown in Fig. 3. Do not run glue more than 1" back from the slot. Install the engine holder, temporarily holding it in place with a rubber band or tape.



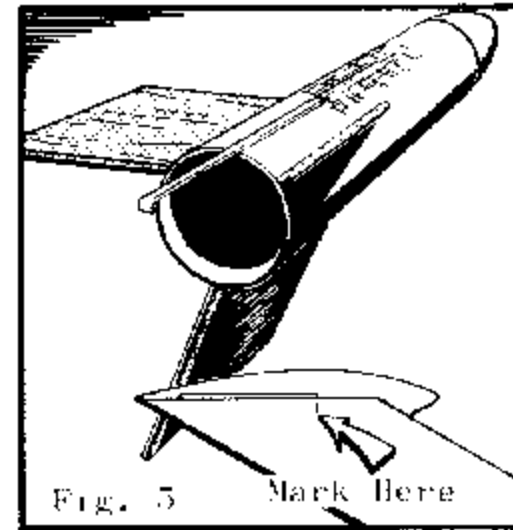
5) Install the launching lug in the position marked from the guide.

6) Cut out a 1/2" x 1-1/2" piece of gauze, coat it with glue and place it over the top of the forward end of the engine holder. Position it so 1" of the engine holder is covered and 1/2" of the gauze extends forward as in Fig. 4. Center the gauze so that about 1/4" extends to each side of the engine holder. Set this assembly aside to dry.



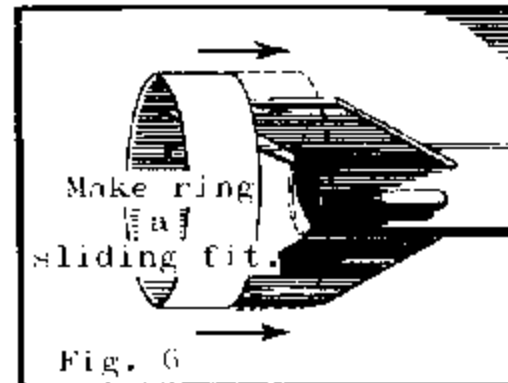
7) Cut out the fin patterns exactly on their edge lines. Trace around the patterns onto the balsa with the wood grain aligned as indicated on the patterns. Cut out all fin pieces. Be especially careful to cut the slot in each fin-cap to the exact size shown. This slot will be used to mark the correct position of the fin-ring.

RING AND FIN ASSEMBLY

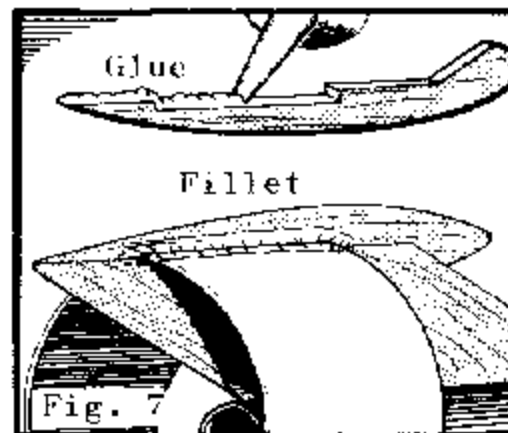


8) Glue the main fins in place on the body tube. Align them carefully so they are perfectly parallel to the body and project straight away from it. When the glue has set on the fin-body joints place the fin-caps on the fin ends to check the fit but don't glue them yet. Mark the main fin at the leading edge of the ring slot as in Fig. 5. This will be the mark to which you will bring the fin-ring when installing it.

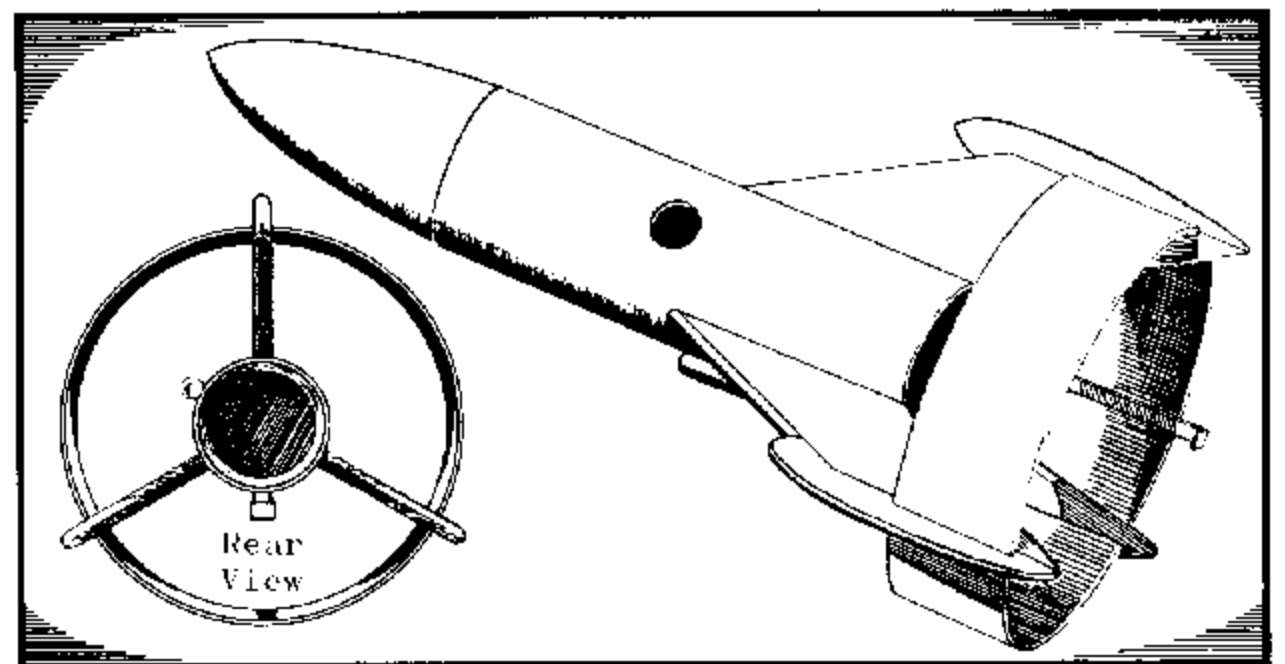
9) Round the leading and trailing edges of all main fins by sanding lightly. Sand both sides of each fin with extra fine grit sandpaper. Sand all fin-cap outer edges to a rounded shape with fine sandpaper. Apply a fillet of glue to the body-fin joint of each fin and allow to dry completely.



10) Fit the fin-ring into place but do not glue it. Sand the tips of the main fins as needed to give a smooth slide fit to the ring without stretching it from its round shape. When this has been done, apply glue to the fin tips where the ring will seat and slide the ring into place. (See Fig. 6.)



11) Apply glue to each fin-cap and place on the outside edge of the ring-fin assembly as in Fig. 7—capping each main fin and securing the ring. When these joints have set apply a glue fillet to all inside and outside edges where the ring meets the fins and to the points at which the fin-caps meet the fins. Allow all glue to dry completely.

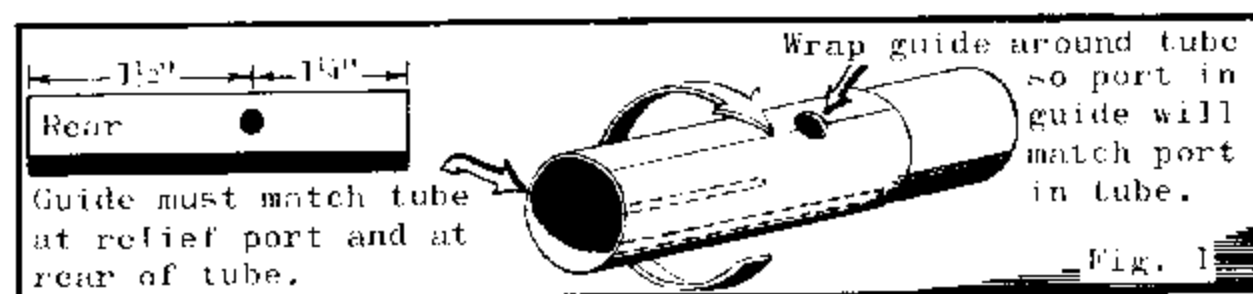


FINISHING

12) Your Astron Sprite may be finished with either butyrate dope or spray enamel in your favorite colors, but for ease of painting spray enamel is recommended. First apply a coat of sanding sealer to all wood surfaces. Let it dry completely and then sand lightly. Mylar backed sanding material is best for this as it will fold and allow close sanding in tight places. Apply another coat, sand and apply still another coat until all the pores in the balsa are filled and the surfaces look and feel smooth. When the sanding sealer is completely dry brush on the butyrate dope finishing coats or spray on the enamel finish. If you choose enamel spray the entire model with one or more coats of gloss white to obtain a clean base for following colors.

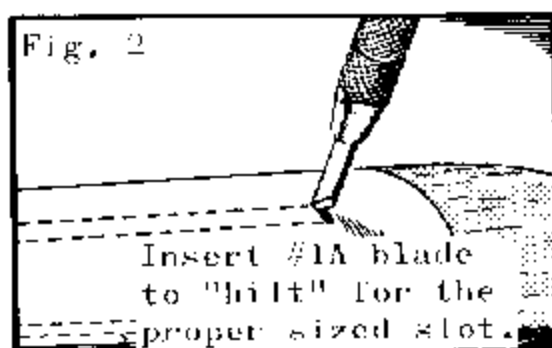
For an extra slick finish apply a coat of paste wax, let dry and buff to a high gloss. Use wax only when the paint is completely dry. Do not use wax over fluorescent paints. NOTE: Spray enamels may be applied over completely dry butyrate dope, but never attempt to brush dope over enamel as it will make the enamel craze and blister.

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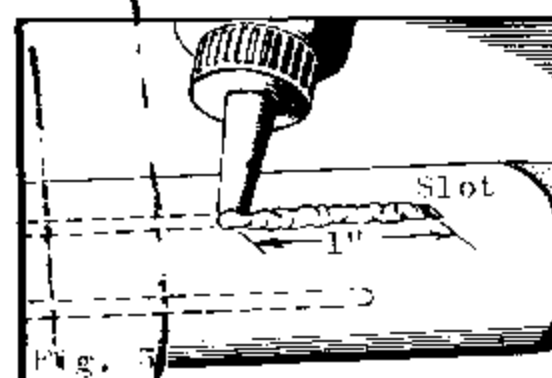


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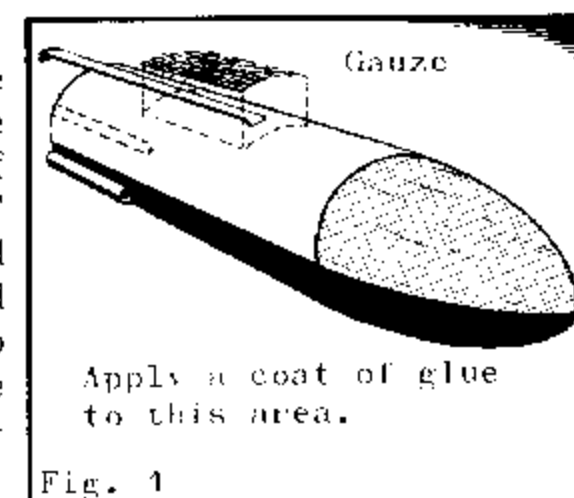


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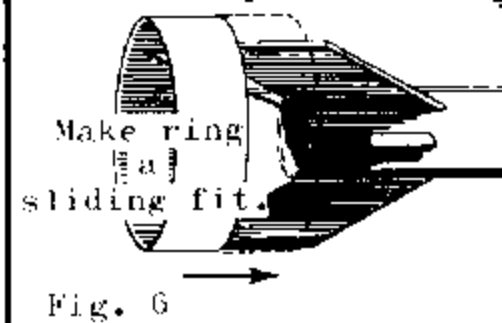


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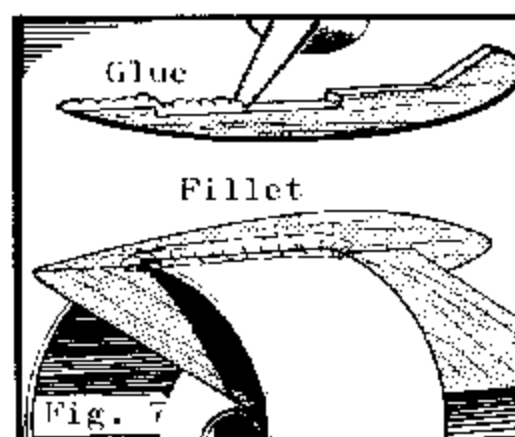
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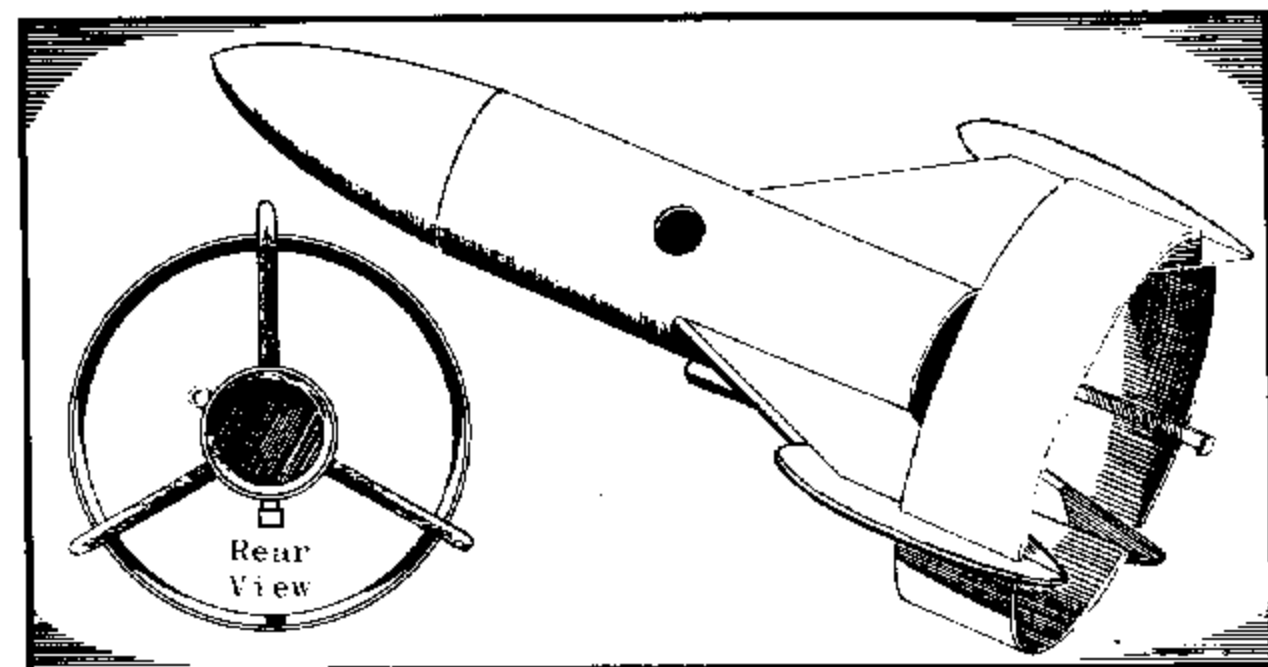
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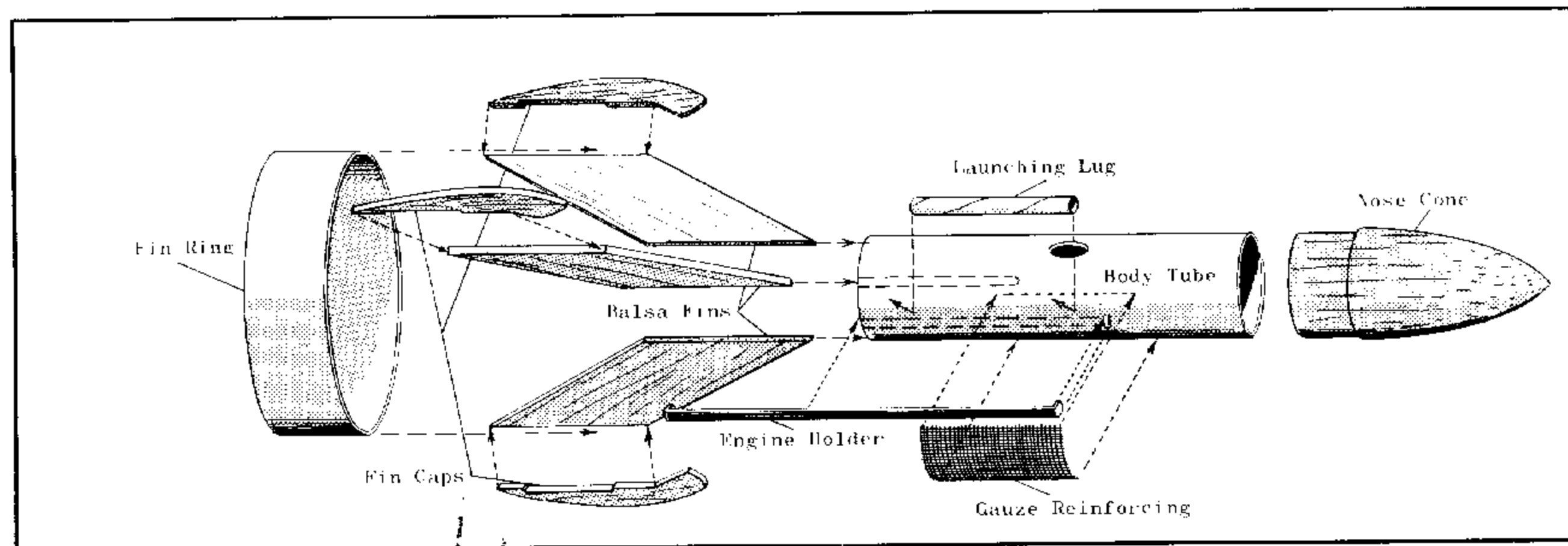
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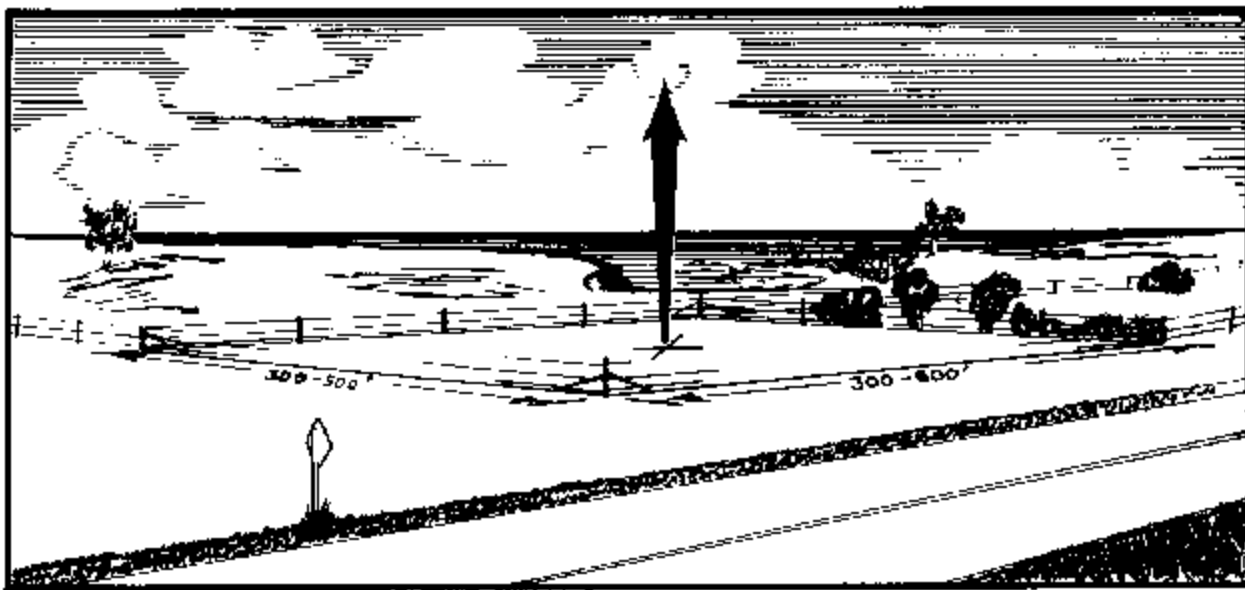
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Kit No. 641-K-15

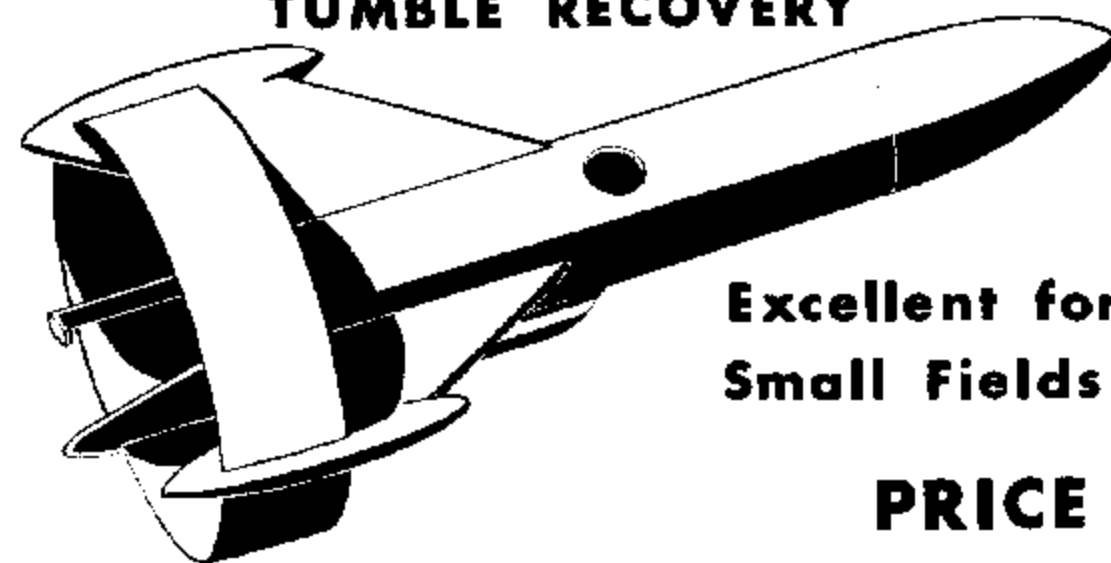
Astron Sprite

Pat. No. 3,114,317

Designed for Series III Engines

Estes Industries, Inc.,

TUMBLE RECOVERY



Excellent for
Small Fields!

PRICE \$.75

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