



MODEL

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ROCKET ROCKET

Volume 37, Number 1 • Issue 92

NEWS

Feel
the
Force!



STAR WARS

TM

MESSAGES FROM LAUNCH CONTROL

ESTES MEANS MUCH MORE THAN ROCKETS!



Welcome!

Here's another exciting issue of the *Model Rocket News!*

I'm Matt Steele, the new editor of the *Model Rocket News*. I started flying model rockets in 1967 with an Estes Astron® Alpha. In the time since then, I have built and flown nearly every Estes kit ever offered.

I've participated in

many forms of national and international competition winning a number of medals and national championships. Professionally, I have worked with the Army Pershing missiles and at Thiokol, where I was involved in a number of Navy missile programs. When the defense industry slowed down, I turned to the hobby market, running North Coast Rocketry®, and eventually ending up at Estes.

I have been a rocketeer since I was ten years old, and have lived, breathed, and eaten rockets since that time. I know how much fun you can have in model rocketry, since I've done nearly everything you can do in rocketry over the past 30 years. Hopefully, we'll show you how to have a fantastic time with model rocketry as well!

Keep 'em Flying!

These days, Estes means a whole lot more than model rockets! In the past three years, Estes has expanded its product line to include nearly every type of flying model!

The growth started with the Light Gliders series. Easy to assemble, these airplanes gracefully soar across the sky, adding new dimensions to rubber band power!



Shortly after, the West Wings balsa scale glider series was released. These are balsa wood gliders scaled to resemble real military aircraft. Printed with authentic details and markings, the West Wings gliders are impressive in the air and on display. The catapult launched F-111 Aardvark and F-15 Eagle really zoom into the sky, just like the real things!



In 1995, the Sterling™ line of model airplanes and boats came into the Estes family. Sterling™ Models, a well known name for over 50 years, is a series of sophisticated free flight, control line and radio control airplanes, as well as model sail boats, racing boats, and warships. Designed for the true craftsman, Sterling™ Models offers a level of challenge seldom seen in the modeling world.



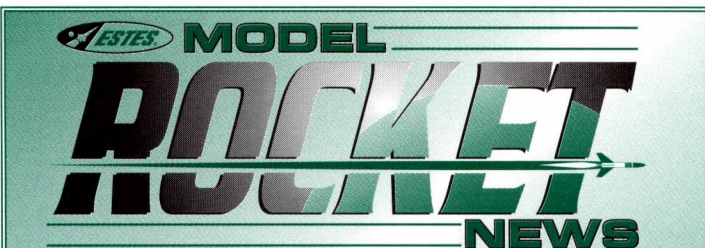
Not forgetting about rockets, Estes joined forces with North Coast Rocketry® to develop a new line of high impulse model rockets and motors for adult enthusiasts. These large rockets, up to 4" in diameter and over 5' tall, are powered by advanced F and G class motors. When you're ready for BIG rockets, North Coast Rocketry is ready to launch!



For over 50 years, Cox has filled the air with the sound of propellers and the fantasy of flight. Now, Estes and Cox have joined together! With the combination of aviation and aerospace expertise, Cox should soar into the next century. If you are intrigued by free flight, control line, or radio control airplanes, Cox has a model for you! Cox also boasts the legendary .049 engine, a mighty mini powerplant with which most model airplane fliers start.



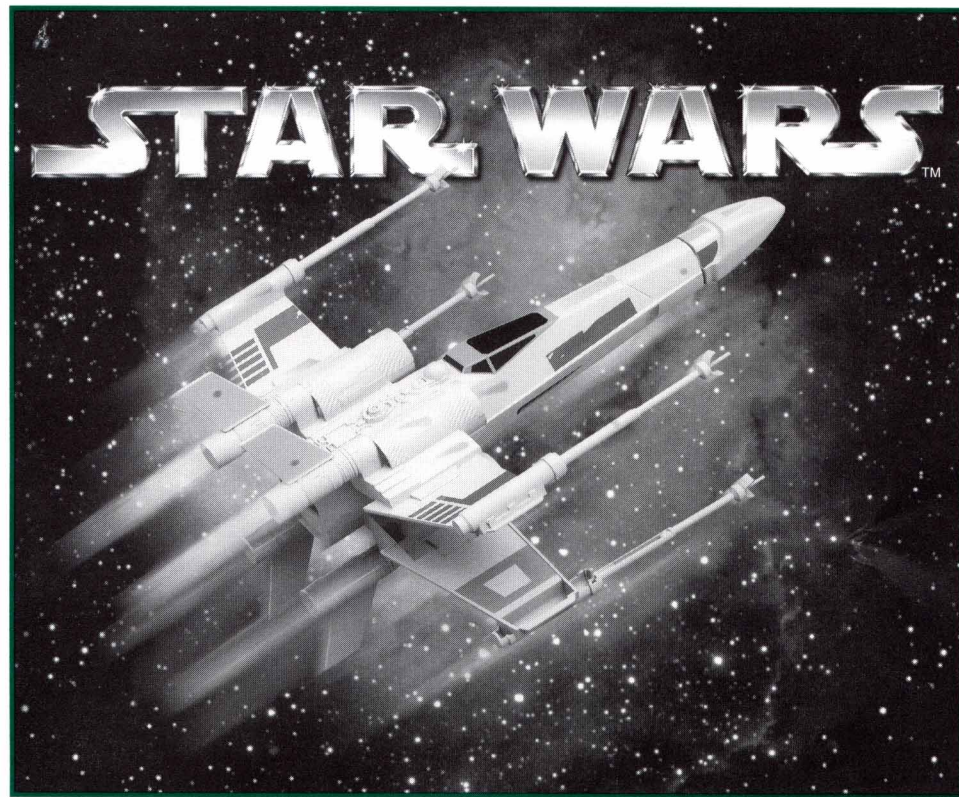
As you can see, it has been a busy time at Estes, as these product lines have been integrated into the operations in Colorado. Rest assured, our model rocket offerings will be better than ever (We hope our 1998 product offerings prove that!) and we're trying to expand our horizons even further!



Editor: Matt Steele
Art Director: Kent Jodrie
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Contributors: Mike Hellmund, Dave Talbot
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The *Model Rocket News* is published twice annually and is available to Estes customers who have ordered at least \$30 worth of merchandise every year. Ordering assures that your name will remain on our active mailing list.

STAR WARS™



Estes Industries proudly announces the release of a brand new set of *Star Wars* models! Brought to you by the world leader in model rocketry, the new Estes *Star Wars* models set new standards for detail and accuracy, as well as ease of construction. Each model has been faithfully scaled from the real movie models used by Lucasfilm™ for *Star Wars*, *The Empire Strikes Back*, and *Return of the Jedi*. The results are stunning.. you'll want to have each of these models, both for flight and as a collectable!

Blast-off with the Estes X-wing and join in the epic space adventure of *Star Wars*! Now you can fly an X-wing starfighter just like Luke Skywalker with the new X-wing starter set! The Estes X-wing flying model rocket is built to withstand the heat of battle and light speed. The kit comes with detailed injection molded plastic wings for easy assembly with magnificent detailing. The rocket can fly over 400 feet high and is recovered by a 12" parachute. Of particular interest is the inclusion of realistic "laser shots" and battle damage decals in the kit (For more tips on

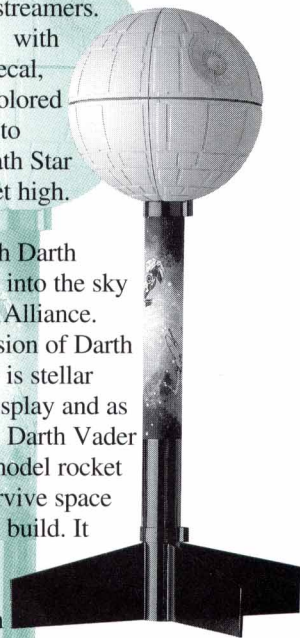


how to give your model the "action" look, consult the article on the following page.) As with all Estes kits, the X-wing can be launched again and again!

Travel back to Dagobah, when Artoo took to the sky after being expelled by the swamp serpent and launch your own R2-D2! The new 1997 Estes version of the R2-D2 flies through the air and returns to earth via a rear ejected parachute. The Estes R2-D2 flying model rocket is designed to be trouble free (unlike its movie counterpart) and a blast to fly over and over. The Estes R2-D2 comes with highly detailed plastic parts and self-stick decals. It can be built in a short amount of time and can reach altitudes over 250 feet!

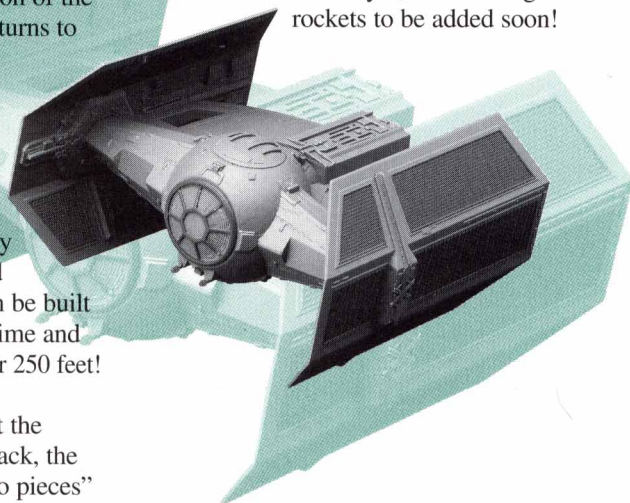
Just when you thought the Empire would strike back, the Death Star is "blown to pieces" in mid-air. The Estes Death Star flying model rocket kit is a safe, exciting, and interactive flying model that you'll enjoy launching many

times over! The Estes Death Star is designed to "burst apart in the sky" at peak altitude. The four Death Star remnants are safely recovered individually with bright, fluorescent orange streamers. The launch vehicle, with a cool body wrap decal, comes down on a colored 12" parachute. Fun to build, the Estes Death Star can fly over 250 feet high.



Now you can launch Darth Vader's TIE fighter into the sky and repel the Rebel Alliance. The 1997 Estes version of Darth Vader's TIE fighter is stellar looking both as a display and as a flying model. The Darth Vader TIE fighter flying model rocket is constructed to survive space battle and is easy to build. It comes with a removable flight probe and can reach altitudes of 250 feet. It is safely recovered with a brightly colored 18" parachute so that you can "battle" with it again and again. The detailed plastic parts are a snap to build and paint. You may even want to have a fleet of TIE fighters!

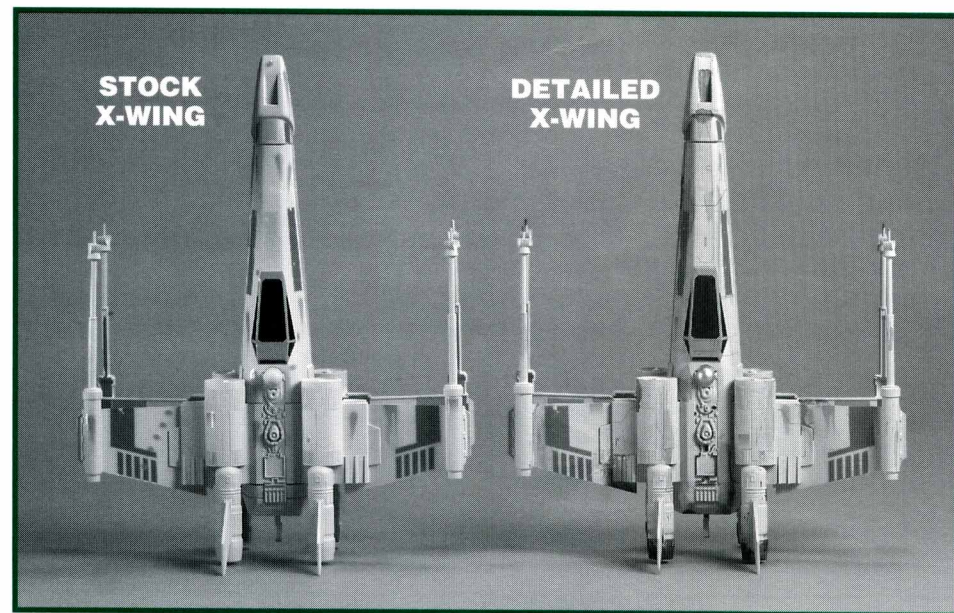
The models shown here are just the beginning of the Estes line. Look for the Star Destroyer, and Y-wing rockets to be added soon!



ESTES MODEL
ROCKET
ROCKET
NEWS

ULTRA-REALISTIC DETAILING FOR YOUR X-WING FIGHTER

BY MATT STEELE



As you've seen in the *Star Wars* movies, the fighters are not exactly pristine. They show signs of dirt, dust and deterioration. The trick is for you, the modeler, to replicate that look on your models.

There are a variety of techniques that you can use to achieve the battle worn look. Most plastic airplane and armor model builders are well versed in the subject, but it is unusual to apply such a treatment to rockets. The *Star Wars* models are an exception.

There are a few basics to consider. First of all, weathering effects will not hide poor workmanship, but rather exaggerate it, so take time and care in building your model. Also, consider that too much weathering can ruin a model. Work in stages, so that you can stop when you feel the effect has reached its peak. After all, there's no sense in spending so much time building the model, only to ruin it in the final steps!

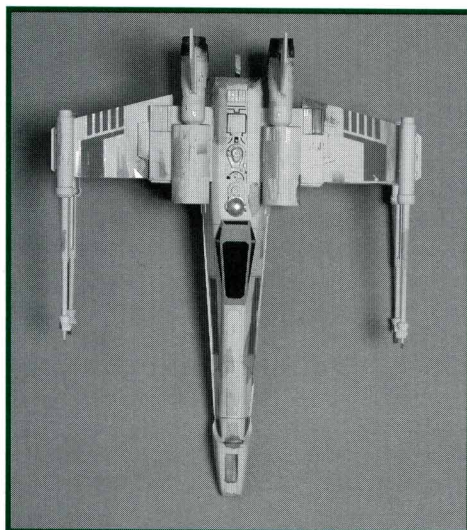
You may wish to use an airbrush at various steps of the application for better results.

BUILDING THE MODEL:

Follow the stock kit instructions, up through, and including decal application. Allow any paint to dry at least 24 hours.

CLEAR COAT THE MODEL:

Wipe the model with a tack rag to remove any dust. Spray the model with a clear coat at this stage to seal and protect the decals and the paint. Use a water based clear gloss acrylic for best results and ease of clean up. Be sure that the clear coat you use is compatible with your base layer of paint by testing it on a small, innocuous spot before committing the entire model, as some types of clear will wrinkle or bleed the base colors of paint. Apply several light coats rather than one thick one. This prevents the clear from running, and builds a good barrier. Allow the clear coat to dry for 24 hours.



PANEL LINES AND DETAILING:

One of the most interesting ways to enhance your models is to add panel lines to simulate where various sheets of metal come together. There are a number of ways to accomplish this, but my two favorites are using dry transfers and/or using a marking pen or pencil.

Dry transfers work best on relatively flat surfaces. Usually, you can use black or gray lines (depending on the effect you wish to achieve) to simulate the panel lines. Most good hobby shops and graphic art stores will carry a wide variety of dry transfers that can represent lines, rivets, and even panels and hatches.

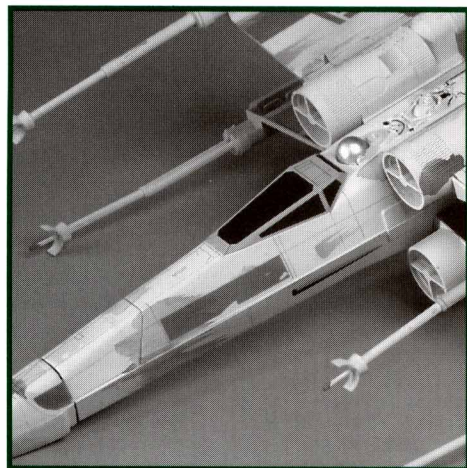
Carefully lay out each line on the model, rub the transfer briskly, and the line will appear on the model. If you don't like the position of the line, you can remove it by pressing a piece of tape to the transfer and lifting it off. Once you are satisfied with the location of all transfers, you can spray the model with another clear coat to seal the transfers in place.

If you want to enhance engraved lines on the model, a pencil, a permanent marking pen, or a technical pen (such as a Rapidograph) works well. These require a steady hand and a "do it right the first time" attitude, as mistakes are hard to repair. Usually, best results can be obtained by tracing the engraved lines with the pen. As with the dry transfers, cover the model with clear coat to seal the markings and prevent them from running or smearing.

ADD A BLACK WASH

The best way to give your models that "used" look is to add a "black wash" that suggests oil, dirt, and general wear and tear to the models. The suggested wash is a thin mix of gloss black, white, dark gray, and thinner. The wash should be thin enough to flow quickly into the detailing, but not so thin as to have no effect at all. We suggest a ratio of three parts thinner to one part each black, white, and gray. Be aware that the mixture may thicken as you use it; be sure to keep it thin, as the whole idea is to simulate the flow of material on the airframe. Black wash the parts of the model with a fine tipped brush or a Q-tip. Let the

application dry thoroughly, then go back and apply a second wash to areas that need more definition. At this point, the model may look terrible, but don't worry about it. Areas to concentrate on the X-wing fighter include the ion engines, the top and bottoms of the wings, the nose area, and the aft end of the kit.



When the paint has dried for 24 hours, the time has come to remove the excess. Using a clean, lint free cloth, apply a couple of drops of thinner to the rag, and wipe over the surface. Wipe off the wash in the direction of the airflow to give the effect a directional look. Don't rub too long or hard in any one area, and don't rub in circles.

For those areas difficult to reach, apply a drop of thinner with a small brush and use it to wipe away the excess wash. Again, a Q-tip or a toothpick may also come in useful. Don't go too far and remove the clear gloss. If you do, let the area dry, then lightly sand the area until it blends in with the surrounding area. Repaint, re-gloss and re-wash the area.

If you can't get the wash off an area and it looks ugly, you'll have to mask the area off and re-paint it with the base color. Then re-gloss the area.

DRY BRUSHING:

You can dry brush detailing in as well. This technique can accentuate high points and adds depth to detailing in low spots. To use this technique, you can get a hobby "weathering" kit, or you can make your own by sanding an artist's charcoal marker and collecting the dust.

Using a paint brush, gently brush the charcoal onto the areas you want to accentuate. (The brush you use will no longer be usable for painting.) On the X-wing, the aft end of

the engines should receive this treatment. Be careful, as a little bit goes a long way. Once you have applied the charcoal, carefully blow the model clean to remove any loose particles, and then clear coat the parts.

You can also dry brush silver to highlight and give the look of worn metal. Using an old paint brush, dip the brush into silver paint, get most of it out, then use the brush to apply silver to high points. This gives the effect of wear and bare metal where the paint and primer has worn through.

FINAL TOUCHES

Adding detail to R2-D2 tops off the perfect model. Be sure to paint the dome silver and the exposed parts of his legs white. If you're really into detailing, you can add blue highlights with paint or a decal.

Getting the paint to look just right, on an X-wing can be tricky. Use a fine brush, and take your time, and the results should be stunning!

PHOTO CONTEST!

We're holding a photo contest to get "the best" photos for upcoming issues of the *Model Rocket News!* If you have a great shot of an Estes product, please send it to us! You could turn that photo into hundreds of dollars worth of exciting Estes merchandise! Just send it in!

Grand Prize: \$200 in merchandise certificates
 First Runner Up: \$100 in merchandise certificates
 Second Runner Up: \$75 in merchandise certificates
 Third Runner Up: \$50 in merchandise certificates
 Any other photo selected for use : \$25 per photo in merchandise certificates

Rules:

- 1 Winning photos will be selected for clarity, composition, and subject matter. The decision of the judges is final.
- 2 All entries must be postmarked by January 15 and received by January 30, 1998 to be eligible.
- 3 Prints (either black and white or color) must be 3" x 3" or larger. Please include negatives with prints if at all possible. Slides (mounted) or transparencies are also accepted.
- 4 Include your name, address, phone number, and a caption on the back of or with each photo.
- 5 All entries become the property of Estes Industries.
- 6 Entry in the contest constitutes permission to use the photograph(s) for promotional purposes.
- 7 Photos can not be returned. Sorry!
- 8 Send all entries to:
Estes Photo Contest
Estes Industries
1295 H Street
Penrose, CO 81240.
- 9 Employees of Estes Industries and their immediate families are not eligible.
- 10 You may enter as many times as you like.
- 11 Winners will be announced in a future issue of *Model Rocket News.*

CONTRIBUTORS NEEDED!

Send us your rocket news, how-to articles, ideas, tips, and suggestions! Articles on model rocketry are welcome, especially those that deal with technical aspects of model rocketry, club activities, and just plain fun. Send your articles to:

Editor, *Model Rocket News*
 Estes Industries
 1295 H Street
 Penrose, CO 81240

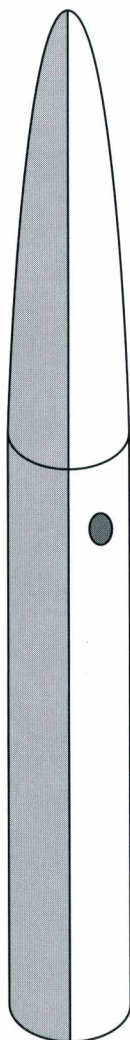
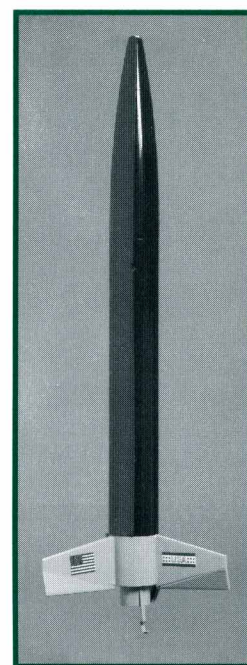
All submissions become the property of Estes Industries and will not be returned.

DESIGN OF THE QUARTER WINNER

Designed by Nathan Chronister (Kingston, NY)
Estes Rocket Plan #128

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- **Challenging to build!**
- **FAST pre-flight prep!**
- **Extremely unique design and flight characteristics!**



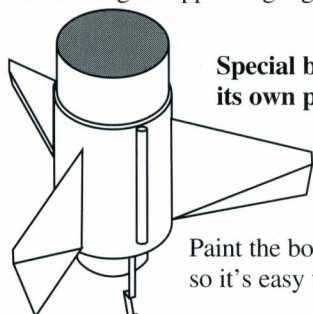
Finless, spin stabilized upper stage allows straighter flights to higher altitudes: The usual weathervaning of multistage rockets has been overcome!

Amazing color change illusion!

Half of the upper stage is painted red, the other half green, as shown in the picture at right. As soon as it takes off, the rocket begins to spin at a very high rate, causing the two colors to optically mix. The rocket appears to be yellow!

Rear ejection or, no recovery wadding needed. The parachute is ejected by a simple piston device. The piston does not separate from the rocket so recovery and preflight are even easier than in a typical model.

Instant stage-coupling requires no tape!
Uses proven nested-engine upper stage ignition.



Special booster has its own parachute!

Paint the booster a light color so it's easy to find.

Suggested Engines:
D12-0 booster, B6-6 upper stage.

Parts list:

Part	Prod. No.	Description	Cut to:	Qty.
A	30396	BT-60 body tube	9 3/8"	1
B	30176-5	JT-60C coupler	3/4"	1
C	30316	BT-20 body tube	8 5/8"	1
D	30128	RA-2060 ring		4
E	30162-2	EB-20A engine block		1
F	35021	Engine hook		2
G	38237	SLT-72 Shroud line	12"	3
H	71043	PNC-60AH nose cone		1
I	35820	PK-12 parachute		2
J	38265	Snap swivel		2
K	38237	SLT-72 Shroud line		2
L	30352	BT-50 body tube	2 5/8"	1
M*		Ring from 1/16" cardboard		1
N	30132	50-60 Ring Adapter		1
O	30174-5	JT-50C coupler	1/4"	1
P*	32116	BFS-40 1/8" balsa *		4
Q*	32116	BFS-40 1/8" balsa *		1
R*	32116	BFS-40 1/8" balsa *		1
S	30176-5	JT-60C coupler	1 1/8"	1
T	30396	BT-60 body tube	1 5/8"	1
U	32056	Dowel, 1/8" dia.	1/2"	2
V*		Indexcard .33"x	1 1/2"	2
W*	32116	BFS-40 1/8" balsa		3
X*	32116	BFS-40 1/8" balsa		3
Y		Toothpick (Round)	1 1/2"	6
Z	38178	LL 2B Launch lug	1 5/8"	1
AA		Tape Rings		2

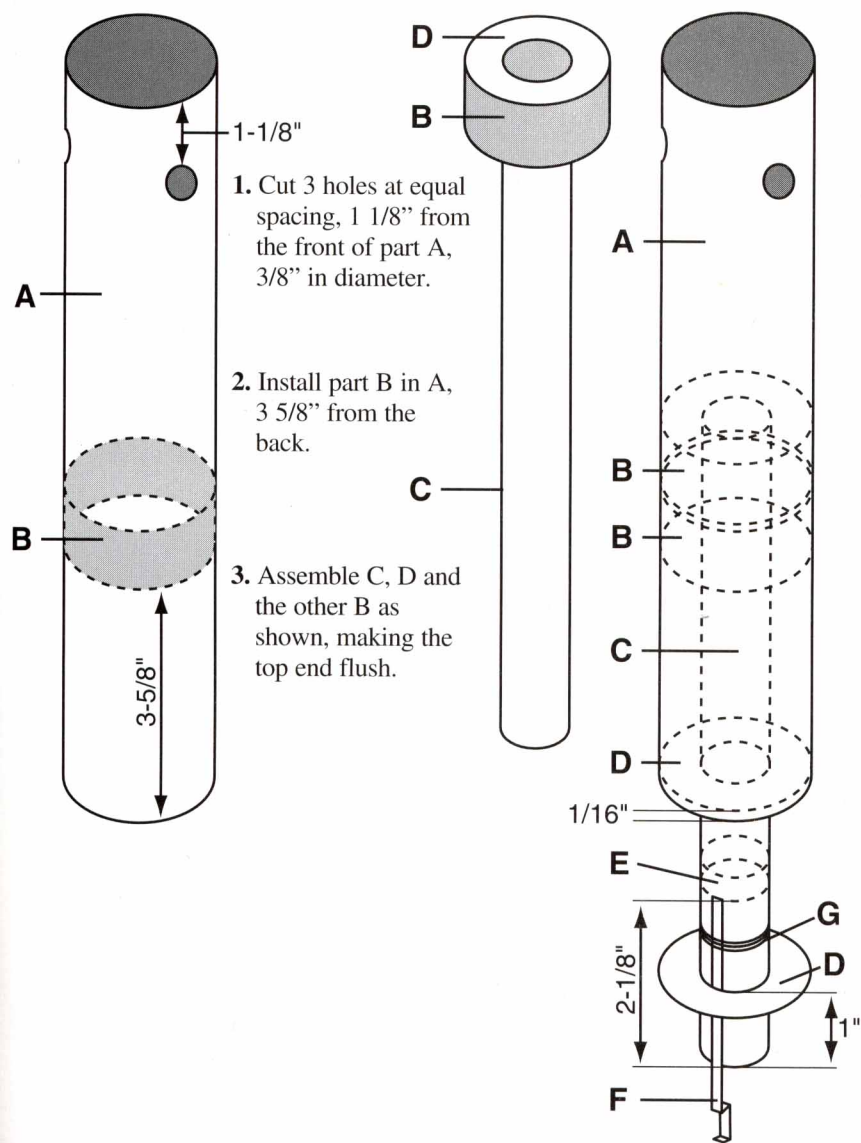
* = pattern on page 8

Only one sheet of BFS-40 and one 18" length of BT-60 are required.

You will need two JT-60 couplers.

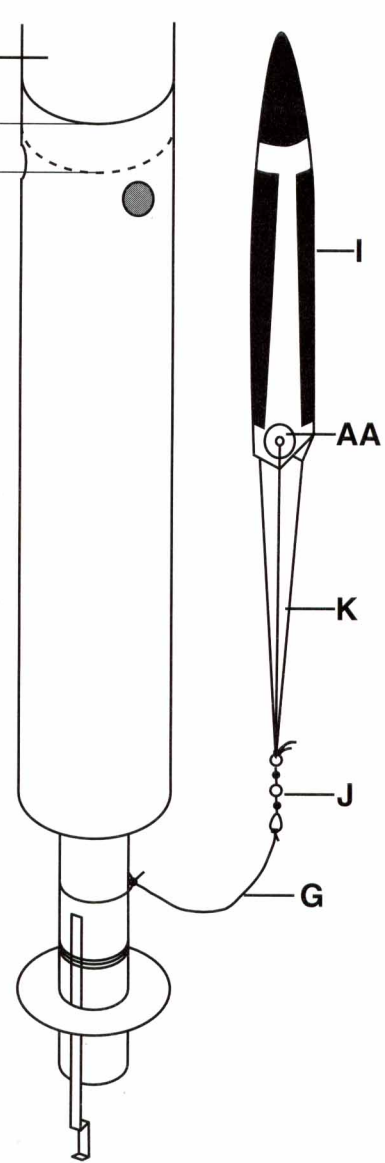
Construction:

Step-by-step instructions are found on the next pages. Before beginning, cut and label all parts. Because Tao is spin-stabilized and uses a sliding parachute ejector, it must be built extra-strong. Make thick fillets but be careful to avoid runs inside the body tube as they would prevent the ejection device from sliding properly. Allow glue to dry between steps. Yellow wood glue is to be used throughout, except as otherwise stated. Because Tao has a very unconventional structure, it is important to follow instructions carefully.



1. Cut 3 holes at equal spacing, 1 1/8" from the front of part A, 3/8" in diameter.
2. Install part B in A, 3 5/8" from the back.
3. Assemble C, D and the other B as shown, making the top end flush.

4. DO NOT GLUE! Insert the free end of tube C into the front of tube A, and push it all the way down until parts B prevent further movement.
5. Assemble the engine mount. Insert E using an engine casing to a depth of 2-1/8". Add part F, wrap G around the tube and coat with glue. Glue the centering rings D only to the inner tube, not the outer one! The first is placed 1/16" inside tube A, the other is 1" from the rear of tube C.
6. WHEN DRY, THE C ASSEMBLY MUST SLIDE FREELY WITHIN "A". Saw H shoulder to 3/4" in length, and attach with epoxy.
7. Tie a line G around tube and glue it. Make parachute (Parts I, J, K and AA). Attach J to G.

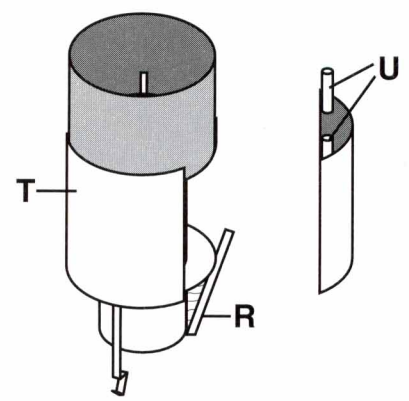
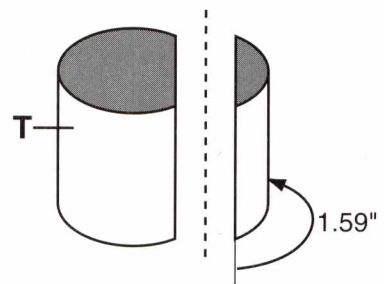
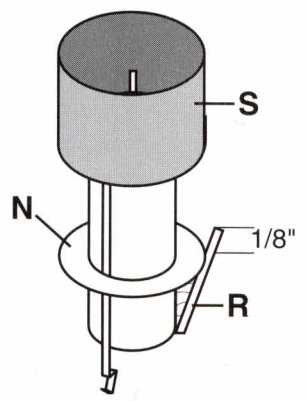
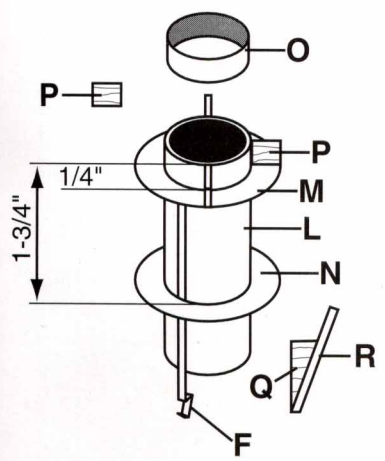


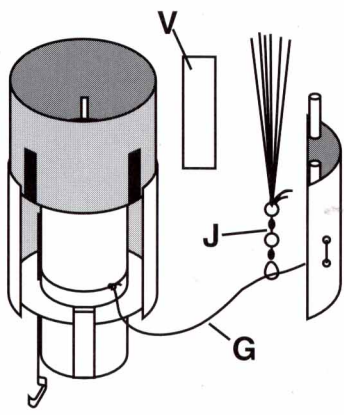
8. Assemble booster engine mount as shown. Rings are at 1/4" and 1 3/4". The special ring M is the one in the front.

9. Add the stage coupler S, so that it just covers ring M.
10. Trim part R so that it protrudes 1/8" ahead of ring N.

11. Measure exactly 1.59" along the circumference of tube T, draw parallel lines using a door-frame, and cut along the lines.

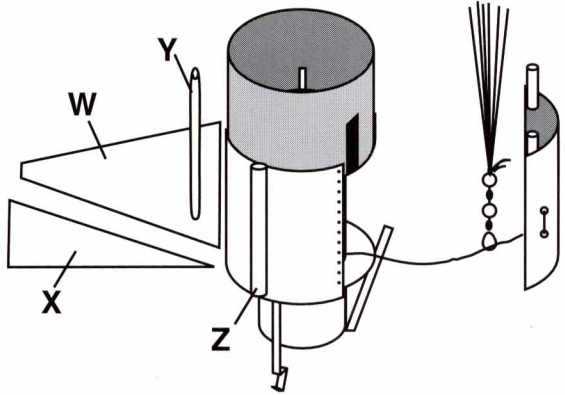
12. Take the large section of tube T, and glue it to the booster directly opposite part R. Then glue parts U to the small section where shown to form the parachute hatch.



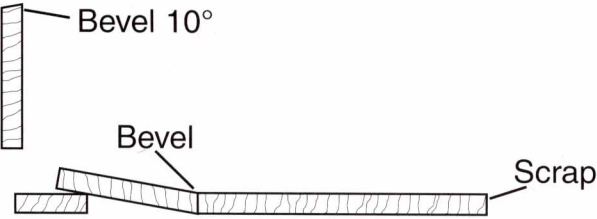


13. Mount the parachute hatch: Make two pinholes in the hatch approximately where shown. Tie one end of a line G through these holes and coat the area with glue. Tie a snap swivel J to line G where shown, and tie the other end of G tightly around tube L and glue the knot. Assemble another parachute using parts, I, K and AA. Parts V are used to cover the holes at either side of the parachute compartment.

14. Cut slots in the stage coupler: The slots allow the hatch to be seated tightly against the booster by hiding parts U inside the coupler. Use the actual hatch as a guide to cutting the slots in the correct location and size. Test the hatch to make sure it works: Pack parachute in the usual way and put it into the compartment. The hatch should refuse to stay closed. Then lock the hatch by sliding the upperstage onto the booster. It should now remain securely in place.



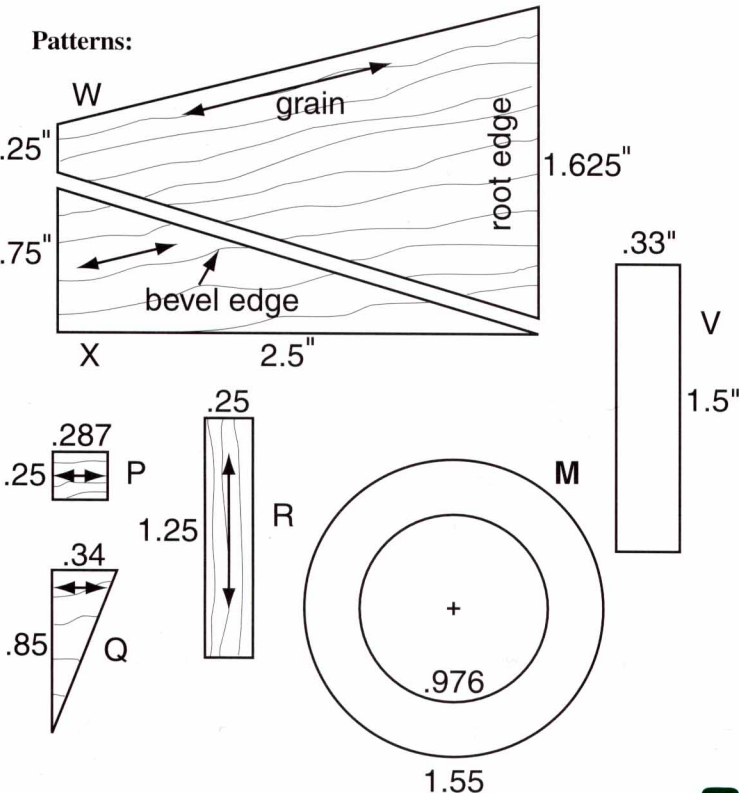
15. Assemble and mount the fins: The fins on this rocket have to make it spin, so they are a little more complicated than your basic fins. Cut the fins from the patterns below. Sand a bevel-edge onto the small fin part, at a 10 degree angle so that it will glue to the main fin part at the same angle. Glue them together, placing a scrap of balsa under the edge of the smaller part while it dries. The three fins you are making must be identical! The angles must be the same, and the small flap must go in the same direction on every fin! After the glue dries, coat the joint areas with 30 minute epoxy to strengthen them. Then sand the remaining fin edges, except for the root edge, round. All three fins are mounted to the large section of tube T. One goes in the middle, and one goes on each edge. Prepare the tube by making a row of pinholes along the joint surface and filling these with glue, to add strength, and then glue the fins on. Before adding the usual fillets, glue toothpicks along side each fin to give added resistance to side-to-side stresses.



16. Attach the launch lug where shown. Coat it with epoxy.

17. Paint as noted on first page of instructions.

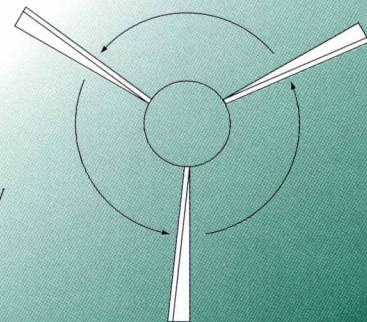
Patterns:



Instructions for flight:

Tao is easy to prep for flight but the procedure is a bit unusual.

- 1) Pack the upper stage parachute by wrapping it around tube C in the direction opposite the rocket's rotation. If you wrap it the wrong way it will tangle or rip loose.
- 2) Push the motor mount into the main body tube, making sure the parachute doesn't get pinched.
- 3) Put a B6-6 engine into the upper stage engine mount.
C engines have not been used and should not be!
- 4) Put a D12-0 engine in the booster.
- 5) Pack the booster parachute in the usual way, and put it in the hatch.
- 6) Holding the hatch shut, fit the two stages together. Note that the upper engine fits down into the casing of the booster engine, for very reliable staging.



HOW TO GET A GREAT FINISH

BY MIKE HELLMUND

Finishing ... the one difficult aspect of model rocketry that everyone wants to do well. The time and patience an individual spends on sanding, sealing, priming, painting, and detailing is reflected in how the rocket looks on the pad. In fact, it is not unusual for finishing to take more time than the actual construction. The secret to having the best looking rocket on the launch field is to be patient - from the point you lay the first pencil line down on the body tube, until you apply the last coat of clear paint.

Every rocket should have some degree of finishing — whether it is as simple as doing a neat glue job and applying self adhesive decals on an E2X® model, or as complex as building and finishing a Mercury Atlas. There are pros and cons to finishing. The obvious pros are that a cleanly finished rocket gives a great appearance and reduces drag. The cons to finishing are a longer building time and a heavier rocket. Even the lightest competition rocket will have some degree of finishing — usually glass smooth fins and body tubes. There are several steps to a successful finish — construction, sanding, sealing, priming, painting, and in most cases, decal application. Let's first touch on construction.

CONSTRUCTION

If you are not neat in your construction techniques, you will have a great deal of difficulty in getting a good finish. This applies especially to gluing. Wipe away any excess glue before it dries. If the glue has dried, sand or scrape it carefully away, making sure you do not do any damage to the underlying part. Make sure all glue fillets are neat, smooth and even. If you have air bubbles in the glue fillets, these can be filled with additional glue or filler. You should also lightly sand or buff with steel wool all the major plastic parts such as nose cones, transitions, plastic fins, etc. This will remove any mold release agents that may still be on the plastic surface, and can prevent paint from adhering.

SANDING

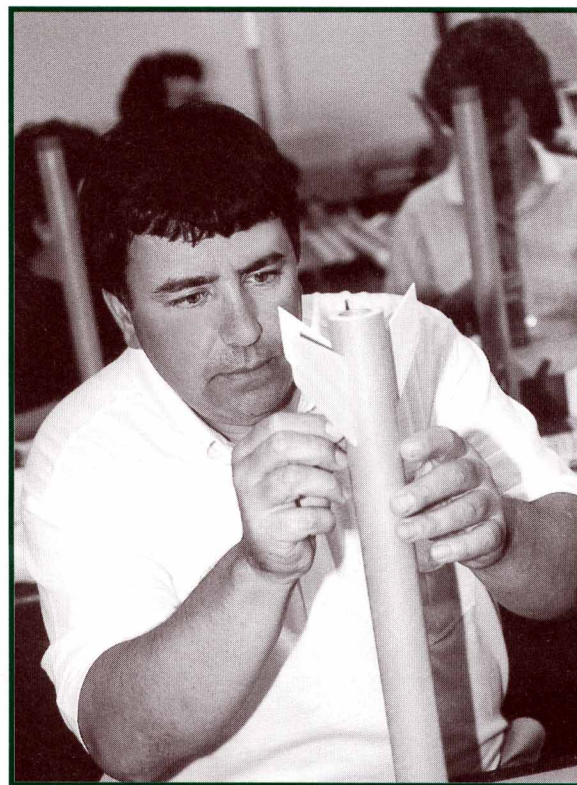
Every external part on a model rocket should be, in some way, touched with sandpaper even if it is just a light dressing. This will ensure good glue and paint adhesion.

First, every modeler should have, at a minimum, the following grits of sandpaper available: #220, #320, #400 and #600. You should have a sanding block (or sanding bar), a sanding stick and a flat table top on which you can tape down a sheet of sand paper. The sanding block will allow you to sand a flat surface smooth (such as fins). A sanding stick (which looks like a square pencil with a sand surface at the tip) is great for smoothing out dried glue fillets especially those around fins. A piece of sand paper taped to a flat surface will allow you to sand straight, smooth edges like the root edge of fins.

Obviously, balsa fins are the one part of a rocket that require a lot of sanding. Stack the fins together, holding them even, and then run the edges back and forth over a taped-down sheet of 320 grit. Sand ALL edges smooth even if you eventually want to airfoil the leading and trailing edges. Once all fins are equal and even, sand your airfoils as desired. Airfoils are best sanded by laying the fin down flat on a small block of wood (larger than the fin itself), with the leading or trailing edge lined up with the edge of the block. By moving the fin edge back a small distance from the block edge, you can control the curve and shape of the airfoil.

The surfaces of the fins need to be smooth, eliminating as much of the grain pattern as possible. Use progressively finer grits of sandpaper (the higher numbers are finer grits) and a sanding block to get great results. Sand with a moderate touch. If you are sanding grooves into the surface you are applying too much pressure.

The next surface that requires light sanding is the body tube. Do this before you mark the fin location on the body tubes. Use 400 grit to start and then 600 grit to finish. All you want to do is to take the sheen off the body tube. This will make stronger glue joints between the tube and the fins. It also allows the paint and primer to go on easier. Don't forget to do the same thing for the launch lug. Remember, the key to success-



ful sanding is to use moderate to light pressure — it's easier to remove material than to replace it because you sanded too much away.

SEALING

This can be the most frustrating step in finishing a model rocket, but there are easy ways to create a smooth surface. First, the traditional method is to use a commercial sanding sealer. You can also make a home brew made out of clear airplane dope and balsa dust or talcum powder, mixed to the consistency of wood glue. Whatever you cook up, do not use a white or yellow glue to mix with your dust or powder. Water-based glue can warp balsa.

To use a sanding sealer, generally you apply a base coat, let it dry thoroughly, then sand the filler down to the balsa surface (so that all that is filled is the grain), and repeat the process until the grain is filled. A sanding block is ideal for this type of work. If you decide to seal your fins before you attach them to the body tube, make sure that there is no sealer on the root edge. Sealer will make fin/body tube joints weak. Another way to seal is not to seal them at all — at least not with sealer. Let the primer do all the work, as described in the following section.

At this point, you want to make sure all gaps, holes and gouge marks are filled. You can use a mixture of glue (white or yellow) mixed with balsa dust or a plastic filler or putty. Make sure you fill the holes in the edges of fins and any air pockets in your glue fillets. It is usually at this stage that the finishing of competition rockets stops. The smooth finish gives the necessary drag reduction, whereas the lack of paint gives the competitor significant weight savings.

PRIMING

First a word of warning: You will be spraying a lot and creating quite a bit of dust. Anytime you spray, make sure there is plenty of ventilation and wear a dust mask. The single most important step in getting a great finish is the use of a sandable primer. Primer not only gives you a nice surface to apply your paint but it also seals and smoothes your rocket (including fins and body tube spirals). An additional benefit is that it will give your rocket a uniform color. This allows you see any potential flaws (such as rough spots that require a little more sanding, or holes that need to be filled). If weight is not a consideration, you will need several coats to get a smooth finish. Spray-on primer is relatively inexpensive and most brands work well. What's nice about primer is that if it runs, the runs can be sanded off quite easily. If you are going to use primer to give your fins a smooth surface, use a thick primer sometimes called "spot filler and primer". This will fill grain and spirals quicker, with less coats than ordinary sandable primer.

Sealing your fins with primer is best done after the fins have been attached. Spray the primer on just the balsa surfaces (the rest of the rocket can be done later). Let the primer dry (usually 15 to 30 minutes). The surface may appear a bit fuzzy. Sand the primer off (with 320 grit) until all that remains is the primer in the grain. Wipe or blow the surface clean. Spray the surfaces again, sand and clean. Leave a little more primer on the surface than in the previous step. If you did a good job of sanding (the sanding done before you primed), you should only need to do this about three times. After the second application, start to prime the entire rocket, sanding it between each application. This will fill in little mistakes and the dreaded spiral on the body tube. Once the rocket is absolutely smooth, spray a final coat of primer, and sand with 400 to 600 grit sandpaper- you do not want to remove

the primer coat in this step. The surface should be uniform in color. Once you're satisfied, you are ready to apply color.

PAINTING

Painting is skill acquired through practice and practice, and practice- plain and simple. This holds true whether you brush or spray. In this article we will discuss aerosol or spray paint. If you have access to an air brush and know how to use one, then that is the way to get the finest of finishes. First, pick a place that has plenty of ventilation like a paint booth or the great outdoors. If you paint outdoors, make sure the temperature is between 65 and 80 degrees and there is as little wind as possible. Make sure bugs (the crawly kind) stay away from the wet painted rocket. If the temperature is not right then carefully move your rocket to an indoor area like a garage to dry after you have painted it. If it is too windy, do not paint. It's not worth the dust and particles that will imbed and mar your paint job.

The next step to successful painting, is distance. If you hold the can too close to the model, the paint runs and drips. If you are too far away, you get orange peel (as the name infers, the surface starts to look like the skin of an orange). If there is low humidity, some paints tend to dry before hitting the surface, also creating an orange peel like surface. The distance stated in the instructions of most paint cans is about 12 to 18 inches. The right distance (which will vary from can to can of the same paint) is where the paint goes on in a nice glossy coat.

First apply a light dust coat of paint. Make sure the entire rocket is painted, but don't worry about covering it all in one pass. Also, don't forget the leading and trailing edges of the fins. Spray the rocket with light, even passes. Start to spray before you reach the rocket and stop after you have passed the rocket's surfaces. Move the can parallel to the rocket. The dust coat lays down a base color on the rocket. Let the dust dry a few minutes and then apply a second, heavier, glossy coat. Don't paint too close- you'll get runs and sags. This is where most of the problems occur and it is only with practice that you acquire the correct touch for applying paint. Paint a third coat if necessary. Follow the same paint procedure as you did with the dust coat. After each coat, let the paint dry thoroughly.

On large rockets, you should paint in sections that are easy to handle. Paint each section right after each other. If your rocket can be physically broken down into sections such as nose cone and or payload, stages, etc., paint each section as a separate entity.

The two problems encountered with most good paint jobs are paint runs and orange peel. There are two schools of thought on how to "fix" paint runs. One way is to take a cotton swab when the paint is still wet and dab away the excess paint. Try not to dab too much paint. You do not want to see the primer coat. Let the paint dry and then sand the surface. With some light runs and sags, you can turn the rocket opposite the flow of the run and allow the paint to flow in the opposite direction. Sometimes this will let the run or sag spread itself out. The second method is to sand runs out when the paint is completely dry and hard (wait at least 48 hours). Use 400 grit to sand away the run, and then do a final sanding of the area with 600 grit. Make sure you confine your sanding to the area of the run.

Orange peel can sometimes be resolved by painting the area again, this time a little closer. In most cases, you will find that you have to sand the surface with 400 or 600 grit. In this situation, you may want to wet sand the area. Use sandpaper specifically made for this type of work (it is usually black in color and stamped "Wet/Dry"). Wet the sandpaper with a small amount of water and sand the affected area. Every so often, rinse the residue off the sandpaper. Regardless if you use wet or dry, you do not want to remove all the paint. You simply want to sand the paint smooth. Repaint the rocket as needed.

If the orange peel is tolerable, then you may use, instead of sandpaper, a polishing compound or even a harsher rubbing compound (both available at automotive stores). Apply the compounds only to rockets that have dried for 24 to 48 hours. Use a soft cloth to rub the compound off. Your finish will become smooth, however the surface may be a little duller than you want. You can restore the shine (necessary if you are going to apply decals) by spraying a clear gloss coat or wax (available at hobby stores) on the surface.

TWO COLOR PAINT JOBS

If you are going for a two color paint job, let your base coat dry completely before you try to mask it. Let it dry for 2-3 days in a warm area. The base coat should always be the lighter color. You will need to mask off the area that will not be painted to ensure any overspray does not ruin your first color. Masking may be required to be done in three zones — close (where the two colors actually meet), medium (1/16" to 1/4" away from the close zones) and large zones (any large areas that will receive no paint).

For close areas use 1/8" to 1/4" wide masking tape to mask off areas. Then use a wider tape (1/2") for the medium zones, with half the tape taped to the straight side of a sheet of plain white paper or any piece of unprinted paper. Do not use newspaper, which can smudge black ink on your paint job. If you are painting rockets that require large areas to be masked off, mask for the close and medium areas as outlined. Then place half the width of 1/2" wide masking tape around the opening of a large plastic bag. Tape the bag to the areas needing protection from the overspray.

A word about tape: Do not use a tape that is too tacky or sticky. Masking tape or magic clear tape generally works well. You can remove some of the tackiness by applying the tape to a glass surface and then applying the tape to the rocket. To ensure that paint does not "bleed through" the masking tape, use this simple trick: Apply a light coat of your first color over the masked area. Let it dry before applying your second color. This will help "seal" the tape and prevent the paint of the wrong color from seeping through the tape into areas where you don't want it. As soon as the last coat of paint is dry to the touch, remove the masking. Be careful in applying too much pressure when removing the masking tape because, although the paint may be dry to the touch, it may still be soft underneath and very susceptible to leaving permanent fingerprints.

PAINTING WITH METALLIC OR FLUORESCENT PAINTS

Before painting with metallic flake or fluorescent paints, it is best to lay down a base coat of white (flat or gloss) paint. Metallics

and fluorescent paints are not known for their thick coverage. A base coat of white will allow these types of paints to show better. This method works well for silver paint, too. A note on fluorescent paints: They do not go on glossy and they tend to look flat. You can make them look a little shiny by coating them with a clear gloss coat.

DECALING

There are two types of decals in the rocket modeling world, self adhesive, and water transferable decals. Self adhesive decals will adhere to almost any surface— flat or glossy. On a flat surface, a glossy decal will be very noticeable. To eliminate this, first spray the model with a clear dull coat before applying the decals. On the other hand, water transferable decals should never be applied on to a flat surface, as they will not adhere well. If your model has a flat finish (and, in the case of scale models, you want it to remain flat), then spray the rocket with gloss clear coat first, apply the decals and after the decals have completely dried, spray model with a clear dull coat.

SELF ADHESIVE DECALS

As a rule, self adhesive decals will stay stuck once you press them against the surface. At times, this makes them problematic to work with. There is a solution (pardon the pun)! Add two or three drops of dish detergent to a bowl of water. Apply this solution over the area on which you want to place the decal. Do not soak the decal in this solution! Position the decal and blot the water away with a paper towel. The water/soap solution will allow you to "glide" the decal into position and helps get rid of any air bubbles. If you do have air bubbles, use a pin to prick a tiny hole into the bubble, then rub down the decal. Large roll patterns and wrap-arounds have always been difficult to apply and match up. The water/soap method will help but you may need to resort to cutting the wrap into sections and applying each section individually. Cut the sections along lines that may be present in the decal. This method works equally well with water transferable decals.


WATER TRANSFERABLE DECALS

Because of their fragile nature, water transferable decals need to be treated carefully. Do not soak them longer than 10 to 20 seconds in warm water. Any longer, and the water will dissolve the adhesive on the decals. If the decals do not slide easily from the paper backing, let them soak a little longer. A decal soaking in warm water will curl, and then begin to relax (uncurl). At this point the decal is ready to be applied. Before applying a decal, brush a layer of water over the application area. This will allow you to glide the decal into position. After the decal is positioned and blotted with a paper towel, you may want to try using a decal solution. Decal solutions soften the decal, get rid of air bubbles, and help the decal tighten down against the surface. This is particularly helpful on surfaces that have a lot of detail (such as a Mercury capsule), allowing the decal to "snuggle" against the details. Decal solutions are usually available at all fine hobby stores. If the decals you are using lack sufficient adhesive, add a drop or two of white glue to a small bowl of water. Mix it thoroughly and then brush this liquid over the area where the decal is to be applied. Reapply the decal, gently blot away excess water/glue solution. Let the decal dry. When dry, remove any glue residue with a clean damp cloth.

FINAL TOUCHES

After your decals have dried completely (about 24 to 48 hours), spray the model with clear coat (either gloss or dull). A dull (or flat) clear coat gives scale and futuristic models a realistic appearance. If you have clear-coated your model with gloss, you can further enhance the appearance by waxing your model with a carnuba based wax (available at automotive stores).

The art of finishing a model rocket is not impossible. It takes patience. It takes time. In the end you will be rewarded with a superb looking rocket.

 **MODEL**
ROCKET
ROCKET
NEWS

DESIGN OF THE QUARTER CONTEST!

It's easy to win valuable Estes products by submitting your model rocket design to Estes! Here are the rules:

1. All entries become the property of Estes Industries and will not be returned.
2. Employees of Estes Industries and members of their immediate families are not eligible.
3. Any type of model rocketry design can be entered (rockets, boost gliders, launch or recovery designs, etc.)
4. Designs should be new, original, and different. They also need to be workable. The goal is to develop something new that other rocketeers can build and use successfully.
5. Entries will be judged on practicality, originality, neatness, completeness, and clarity. All plans must be flight-tested and proven safe and successful.
6. Winning entries may be published in the *Model Rocket News* and/or other Estes publications.
7. Your design entry should include a parts list and any instructions or diagrams that you feel would be helpful. Include a list of the engines with which the entry has been successfully flown (if applicable). Be sure your name and address are on each page of your entry.
8. Please do not send the actual model unless requested, as it will not be returned.
9. Photos of the model are greatly appreciated, but not required. However, photo documentation of your entry may help it win.
10. You may enter as many times as you like.

11. There is a new contest every quarter (January to March, April to June, July to September, and October to December).
12. All designs reaching Estes Industries during that quarter will be entered in that quarter's competition. Date of receipt, not post-mark, will determine the quarter that the design is entered.
13. If two or more exceptional entries are received during any quarter, the judges may, at their discretion, make identical awards.
14. Designs should be sent to:

Design of the Quarter Contest
Estes Industries
1295 H Street
Penrose, CO 81240

- All plans sent to us will be placed in the Estes Design contest.
15. Each quarter's winner will receive a \$100 merchandise gift certificate and a certificate suitable for framing. Award winners will be notified by mail.

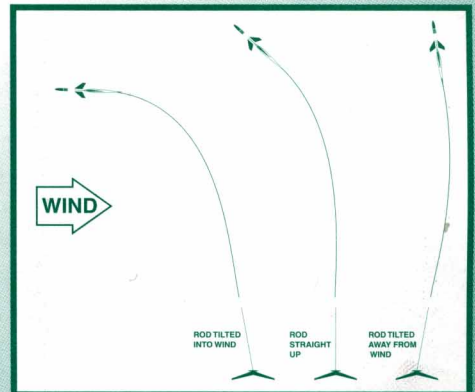
Here's a few tips to help make your entry a winner:

- A. Make sure your designs are built and test flown.
- B. Include a parts list.
- C. Make a drawing of the design that is complete and includes all necessary patterns.
- D. Be neat! Neatness does count!

We are looking for innovation and proven performance. Good luck, and send those entries in today!

FLYING TIP:

Remember that rockets always fly into the wind, or "weathercock". As a result, to get maximum altitude, you want to actually point the rod "out of the wind" rather than into the wind. When you point your rocket into the wind, you reduce the rocket's altitude, and may reduce the required delay time as well. The illustrations above indicate a rocket's flight path in a moderate breeze. The best bet is to fly straight up whenever possible. If it's too windy to fly in your field, just wait for another day...it also saves on a long chase down wind.



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