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N E W S L E T T E R



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Cover Photo: NewWay Space Model's Square One rocket kit. Get one at:
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Hand Painting Rockets Made Easy

By Barry Barker

While painting a model rocket, have you ever accidentally spray-painted something you shouldn't have, such as your glasses, your hand, a tabletop, your clothes or the floor? Have you ever found yourself, paper towel in hand, smearing icky globs of sticky paint all over your newly sprayed rocket after a delicate attempt to remove a tiny gnat has somehow gone horribly wrong? Or maybe you've simply run out of paint, halfway through the job, more than an hour round trip from the store, when the instructions on the can clearly state that it has to be recoated within one hour or after twenty four? If you're anything like me, you have done these things, and you have done them repeatedly. Well, there is an answer. It's called hand painting. I do

it. I'll show you how you can too.

Getting Started

To get started, you only really need two things: 1) a little bottle of non-toxic, water-based craft paint from the local craft store; and 2) a brush. If you want to get crazy, you can add more colors, some painter's tape, a few more brushes, some wood filler, some 220 and 320-grit sandpaper, Scotch-Brite pads and some clear water-based polyurethane for a complete hand-painting kit.

Now, I know you're probably thinking, "This sounds horrible." Trust me. It's not. Here are some of the many benefits:

- You can actually get some pretty nice results.
- Cleanup is a snap.
- You can combine all sorts of colors in your paint scheme.
- You only have to mask off the wet edge you're working on.
- Wait just a few minutes between coats.
- It's something you can do indoors, in the winter, whenever and wherever you like.
- It's also perfect for kids.
- It's safe, non-toxic
- Slow (keeps them busy for a while)
- Helps develop eye-hand coordination.
- I also like it because I find it pretty relaxing.

Step 1: Getting in the Right State of Mind

Step one in the process is getting in the right state of mind. Stop looking at custom Harley-Davidsons, \$100K sports cars, competitive aerobatic aircraft or anything with shiny carbon fiber or chrome on it. This doesn't mean you're going to get inferior results. It means you're going to get different results. To get the idea of how different, rent (or better yet buy) a season or two of Gerry Anderson's 1960's *Thunderbirds* TV show or one of the feature-length films, *Thunderbirds are GO* (1966) or *Thunderbird 6* (1968). That will benefit you in countless ways, but for our purposes, it will get you in just the right frame of mind. What does that mean? Well, it means being creative, understand-



Figure 1: The complete paint kit for hand-painting rockets.

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ing that it doesn't have to be perfect to be fun, and recognizing that patina can be just as cool as gloss. Look closely at those Thunderbird rockets; they're anything but perfect. They're surprisingly rough, dirty, scratched, and worn. We'll call that character, and that's a good substitute for "perfection."

Step 2: Prep as Usual

There's unfortunately never an out for sanding.

Prep the same way as always—sand, fill, sand everything smooth, then scuff sand any shiny stuff until it's dull. Then, mask off what you don't want to paint and paint what you do want to paint. The cool thing here is that masking is much simpler. You don't have to mask off the whole rocket. You only have to mask of the wet edge you're working on at the time.

Figure 2 shows the *NewWay Space Models Quad Goblin* (www.ApogeeRockets.com/Rocket_Kits/Skill_Level_2

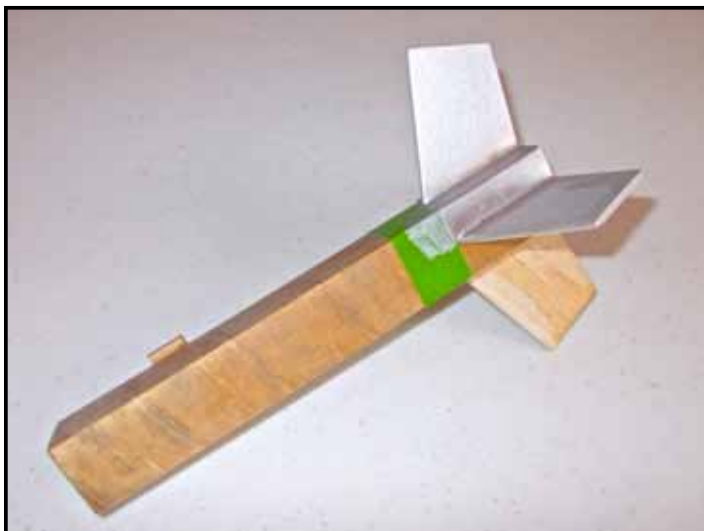


Figure 2: Masking only the wet edge on the Goblin kit.

[Kits/Quad_Goblin](#)). Notice the masking is accomplished with one small piece of tape. That's possible because there's zero overspray, because there isn't any spray. You'll be masking and re-masking in tiny bits throughout the painting process—always just the wet edge, and sometimes, you can get away without even masking at all.

Step 3: Paint

Paint in layers. It will usually take three to five of them to build up a good base finish. Some paints are more transparent than others. The more transparent paints will require more coats. I try to stay away from them. Some paints also dry more slowly than others. I tend to stay away from those as well. I like less transparent paints that dry fast. In some instances, these paints dry so quickly that it's possible to finish one coat and go right back to where you started to begin the next. On larger rockets, when drying too quickly can be a problem—you can't maintain a wet edge—simply thin the paint with a little H₂O, the only solvent required. You can also use a larger foam brush to cover more ground. While it's not necessary to sand between layers, sanding can be incorporated at times to reduce or remove the appearance of brush marks from the final finish.

Once you've built up a few coats against your masking tape, you'll notice that when you remove the masking tape there is both a built-up thickness of paint and a raised ridge of paint. It's generally possible to paint your next color up to this build-up and ridge with no masking at all—it acts like a little wall or dam to stop the paint and the movement of your brush. Once your second color is done, there will be equal thickness layers of paint and a raised ridge of one color or both. Let the project dry overnight and remove the ridge with a very light sanding. You'll be surprised at the straight edge you've produced.

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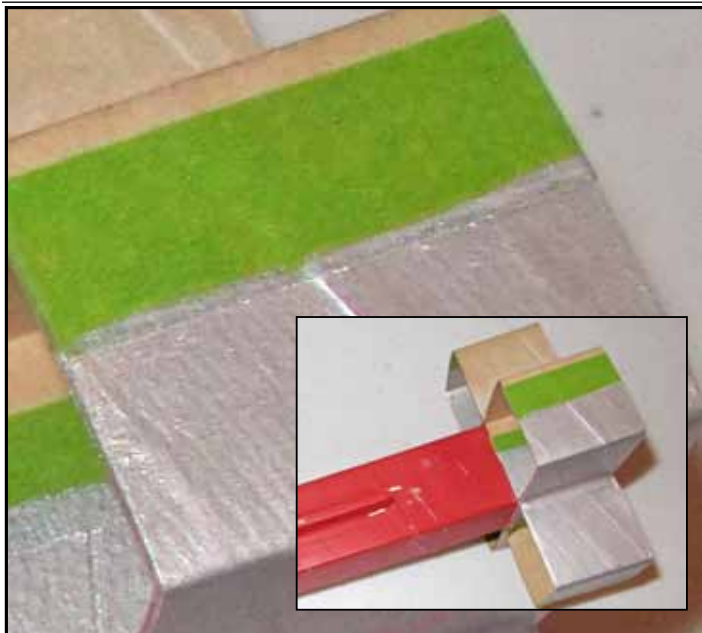


Figure 3: Building thickness with multiple layers of paint.

As seen in Figure 3 above, if you look closely at the *NewWay Square One* (www.ApogeeRockets.com/Rocket_Kits/Skill_Level_2_Kits/SquareOne), it's just possible to see the tiny ridge on the layer of silver paint against the masking tape. The spots of bare cardboard showing through the red paint are the result of an initial sanding to level some high spots.

This particular rocket requires painting on the inside surfaces of the square tubular fins. That's easy with a brush. As is visible in the photo, it was even possible to change colors in there.

It's important to note that the layers of paper in some cardboard tubes can separate in spots and "bubble up" when exposed to the water in craft paints. Rick Randol,

founder of NewWay Space Models, explained to me that that's because some tubes, like those used on NewWay and some other rockets on the market, are uncoated, bare paper. He and another member of my local rocket club recommended I use a brush-on sanding sealer such Rust-oleum Sandable Primer in the future and I'll certainly give that a try. Another option is glue-sizing by applying a thin coat of Titebond III with a foam brush. I saturated one of my NewWays with CA and left the other bare. The CA had no real "primer" effect. Any bubbles in the paper shrank away as the paint dried and I ended up with nice results. Tubes with a shiny glassine coating don't require sealing but scuff sanding seems to slightly improve adhesion. Adhesion is generally not a problem and never a problem on the uncoated paper tubes.

Step 4: Finishing the Finish

Hand painting provides a lot of flexibility in finishing the finish. If you're working with a



Figure 4: Painting the fins on a booster stage.

Continued on page 5



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Cub or Daisy Scout troop, leave it with the last coat and you're done. If you're working on your own project, you will probably want to add some clear, water-based polyurethane for additional protection.



Figure 5: Finished Rocket with "Decals." Note: No masking was use on edges of fins! Just run the brush over the edge.

I like to add several coats of water-based polyurethane in part to seal down any decals applied on top of the final coat of craft paint. I often make my own cheap "decals" simply by printing things out on multipurpose paper with my inkjet printer.

For the NewWay rockets here, I printed them in black. The paper, when cut, reveals a white edge, the result of the thickness of the paper. I simply ran a black Sharpie marker around the edge to make it go away. I then glued the paper on the rocket

with a glue stick, done. The subsequent coats of clear poly tend to keep the edges down. Be careful to dab the first coat of finish on, or pre-seal the decals, because the H₂O in the finish can cause the ink to bleed.

Whether you've chosen to end with paint or with clear poly, once the rocket has dried thoroughly, you can decide whether you want a gloss or matte finish. For the old-school V-2 rocket pictured, I chose to back the paint finish off to a dull, matte finish by buffing the entire rocket with a 3-M pad. You can safely apply some considerable elbow grease. The result was a satin smooth, dull finish with very few if any brush marks. It's possible to back the poly off to the same appearance or conversely, build up layers of clear finish, buffing between coats, to a considerably glossy look. Keep in mind, however, that more gloss will show off more of your "imperfections."



Figure 6: V-2 with matte finish, which was rubbed-down to an old-school look.

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Brush vs. Sprayed Appearance

It's a little difficult to describe the difference in appearance between brushed and spray-painted finishes partly because there is so much variation in the way different rocketeers finish their projects. At my local launches, I've seen everything from unpainted rockets to rockets with almost a stucco appearance (both intentional and unintentional) to rockets that are *truly museum quality*--which is easy to determine because we launch just a safe distance

the finish. From some angles, as shown in Figure 7, the brushed-on finish on my *Mad Cow Aerobee* looks as good or better than the sprayed on finish on my *Aerotech Sumo* (www.ApogeeRockets.com/Rocket_Kits/Skill_Level_3_Kits/Sumo).

The effect of lighting is quite noticeable in Figure 8, which is just the fins on the *Aerobee*. While the fins are smooth and slick to the touch, it's possible to see the wood grain (unfilled) in both the silver and black fin areas, showing most dramatically in the black.



Figure 7: Sprayed Sumo and Brushed Aerobee.

from the Association of Model Aeronautics (AMA) Museum located in Muncie, Indiana.

While it's theoretically possible to achieve museum quality with a brushed-on finish, it's also possible to achieve something akin to stucco. My standards tend to be a little in between. It's a little bit difficult to capture the quality of the finish because, unlike sprayed finishes, brushed-on finished vary a lot depending on the angle of light striking



Figure 8: The way the light hits the rocket will conceal or reveal the ridges in the paint.

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Figure 9: The difference between sprayed and brushed nose cones. Take care when sanding not to sand deep colors into light colors. I made that mistake here resulting in a slightly less-than-white white.

Step 5: Making Repairs

One of the many benefits of hand-painting rockets is the ease with which one can make repairs. The little V-2 shown in Figure 10, on perhaps its second flight, unfortu-

nately ejected its motor out the back at apogee, resulting in a failure to eject the chute. The results of impact were just short of catastrophic.

While the main body tube required replacement, the balsa nose cone and entire tail assembly were salvageable. Since the craft paint keeps for years (with no nozzle to clog) I was able to scuff sand and touch up the parts and repaint them to make the rocket good as new. This



Figure 10: A V-2 rocket in need of repair.

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little rocket has undergone two similar reconstructions. The earlier picture (Figure 6) is from after the first rebuild!

Tips for Hand Painting Rockets

- Experiment with different brands of paint. Some are less transparent. Some dry faster. Some are thick while others are thin. They're cheap, so experimentation is easy to do.
- Use fresh paint. Although these paints last several years, you want to make sure your paint hasn't been on the shelf for several years before you buy it. Stay away from dried-out or faded labels. Feel free to ask store staff about their stock.
- Thin paint if you need to with the only solvent you'll need, good old H₂O. As long as you don't over thin, it really won't compromise the finish, especially if you're planning to add some clear poly for protection.
- Clean your brushes immediately. I swish them around in a cup in the sink and then suck the moisture out of them with a Shamwow towel. It takes only a second and the brush is ready for another color.
- If possible, keep a record of the colors you've used. If you're like me, you'll end up with a tub of all sorts of paints, many of the similar colors. Keeping a record of the paints you used on a given rocket will help you easily locate them for repairs.

It's Not Just for Little Rockets

Because I live in an apartment, I use this technique on virtually every rocket I build--that is unless I'm in a real hurry and the conditions outdoors are suitable. The head of my little Aerobee family stands a full 58" tall. It's hand painted too. Think about using foam brushes on larger projects.

Share Your Expertise!

While I have painted quite a few rockets by hand, I am anything but an expert. I consider myself a brush-painting tenderfoot and I am experimenting as I go to improve my skills. My next steps are to work with balsa fillers, primers, and glue sizing to determine what works best for the types of rockets I build. I'll also be investigating some of the different water-based polyurethanes on the market to see if some work better than others. If you have any experience

hand painting rockets, please share your input!

About the Author

During the day, Barry works as a social researcher at Indiana University-Purdue University Indianapolis. On weekends, weather and schedule permitting, he can be found launching rockets with the Rocketeers of Central Indiana (ROCI) (NAR Section #625) at the Academy of Model Aeronautics (AMA) in Muncie, Indiana.



Figure 11: The Aerobee Family: Aerobee, Aeroflea, Aero3 and Sqaure-O-Bee



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