

product Spotlight

New products that are **Worth a Closer Look**

presentation. Those looking into learning and practicing 3-D flight might find this useful to learn new 3-D tricks to try at the flying field.

The two-disc set is available for \$19.95, plus shipping, directly from Precision Aerobatics.

Precision Aerobatics: 113 N. Market St., Winamac IN 46996; Tel.: (770) 292-9122; website: www.precisionaerobatics.com

HOW TO 3D TWO-DISC DVD SET

REVIEW

Precision Aerobatics has released a new two-disc DVD set showcasing Daniel Dominguez flying the company's airplanes, with the goal of teaching the viewer how to fly 3-D. This video replaces the previous two-disc set, with the main difference being that the previous flight simulator footage was replaced with actual flying with the pilot's transmitter overlaid in the bottom right corner of the screen during the instruction.

Each of the 14 maneuvers covered—elevator, Parachute, Wall, Harrier, knife-edge, knife-edge elevator, Waterfall, flat spins, Blender, Hover, Torque Roll, Snap to Hover, knife-edge spin, and Rolling Harriers—is taught in order of difficulty. Narration walks the viewer through each maneuver.

This release has some additional bonus footage of aerobatics and 3-D flying. The instructional portion has a run time of approximately 40 minutes.

Both DVDs feature a menu system that offers fast, easy access to specific footage instructing on each maneuver. This is helpful when the viewer wishes to review certain maneuvers.

If you are interested in instruction about 3-D flight and want to get a feel for how the material is provided with this set, you can watch a trailer for the release on the Precision Aerobatics website.

Because the maneuvers covered in this release match those of the previous set, people who have the earlier version will find the material similar, but with an updated



ESTES PROTO N MICRO QUADCOPTER

REVIEW

Terry Dunn reviewed the Estes Proto N Micro Quadcopter. Here is what he had to say:

Just when you thought that multirotors couldn't get any smaller, somebody figured out a way to stuff all of those parts into an even tinier package! The new Estes Proto N measures slightly more than an inch wide, making it one of the smallest flying models you can buy. Perhaps the most amazing aspect of the Proto N's miniscule size is that it sacrifices nothing in stability or controllability. This is an honest-to-goodness precision flying machine. It just happens to fit in the palm of your hand—with room to spare.

The Proto N is a complete package that includes the airframe, a 2.4 GHz radio, and a USB charging cable. There is also an extra set of propellers. You only need to provide four AAA batteries for the transmitter.

The quadcopter has a two-piece plastic body that covers all of the electronics. Estes offers the Proto N with a green, white, black, or red body. Whichever color you choose, you won't have to assemble anything. The Proto N is factory built and ready to fly out of the box.

Many micro quads on the market come with equally small transmitters. Some of those radios are simply too small for adult hands to comfortably or correctly operate. That isn't an issue with the Proto N. Although the radio is considerably smaller than a standard RC transmitter, it is plenty large enough for adult hands.

The transmitter has a compartment to house the airframe between flights.

There's no place, however, to store the charging cable. I remedied that by gluing a small hook-and-loop strap to the back of the radio on the battery compartment door. This provides an out-of-the-way place to store the cable and ensures that it doesn't get lost.

If you're new to flying multirotors, micro quadcopters such as the Proto N are ideal starter models. They fly like larger machines, but they are so small and lightweight that

a routine crash is unlikely to break anything on either side of the collision.

Another benefit of micro quads is that they can be flown inside your house. This is doubly true for the itsy-bitsy Proto N. An average-size living room is like a wide-open prairie to this little aircraft.

The manual does a decent job of explaining how the controls work. In addition to the radio's two joysticks and trim levers, there are two buttons on the top. The left one allows you to choose between three control sensitivity settings, and the right button is used to make the Proto N perform aerobatics.

I was surprised by how docile this little quadcopter could be. New fliers might find it slightly touchy at first, but I suspect that most people will quickly get the hang of it. Stepping up to the higher control levels gives you noticeably more control authority. I can make the Proto N zip to the extremes of my living room on the middle control setting. I generally reserve the highest setting for outdoor flights.

After pressing the flip button, the Proto N will execute a tumble in whatever direction you move the right control stick. Don't blink because it happens fast. The quad resumes a stable hover as soon as the flip is complete. It's a fun feature.

In-flight orientation is often a concern with quadcopters.



This problem is exaggerated by the Proto N's tiny stature and solid-colored body. Although the different-colored propellers help distinguishing front from rear, the best visual cues are the LED lights positioned at each corner of the frame.

The lights (blue in the front, red in the rear) are even visible in daylight. The only problem is that their location makes them difficult to see in some orientations, so keeping track of the little aircraft can be challenging. Indoor flying isn't much of an issue, but you'll want to keep the Proto N close by if you fly it outdoors.

My flights have been averaging 4 minutes each. Those flights typically involve precision hovering, some fast translation, and a handful of zoom climbs and flips. Your flight times will vary depending on your flying style. It takes slightly more than 30 minutes to recharge the battery.

The Estes Proto N is a fun, inexpensive little flying machine at \$34.99. It is ideal for people who are ready to try multirotors for the first time.

Learning is stress free when there is almost no risk of damaging anything. The flying skills learned on the Proto N will directly translate when you decide to step into larger and more complex multirotors.

The Proto N is also good for honing your flying chops when weather keeps you indoors. Need to practice spot landings? Try setting the little quad down on top of a soda can. It's good practice and good fun!

Hobbico: 3002 N. Apollo Dr., Ste. #1; Champaign IL 61822; Tel.: (800) 637-6050; website: www.estesrockets.com