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VENOM AIR CORPS

NIGHT RANGER 3D



Kit Specs

Product:	Night Ranger 3D
Class:	Electric 3D Heli
Manufacturer:	Venom Aircorps
Website:	www.venom-aircorps.com
Street Price:	\$210
Availability:	February 2006
Required to Operate:	Nothing
Target Audience:	Intermediate Heli Pilots

Reviewed by [futureal](#) on 3/5/06

i'm sure that right about now you are saying to yourself, "Hey, this site is all about RC cars, not helicopters!" Well, that may be the case, but if you've never tried giving yourself that third dimension to work with, you are not living the full radio control experience. As most of you know, last year the magazine I write for, [Xtreme RC Cars](#), launched a second title called [RC Heli](#). This gave me the opportunity to do something I'd always wanted to do: learn to fly an RC heli! Just

like cars, the world of RC helis is full of electric and nitro kits, upgrades, events, competitions, world-class pilots, and everything in between. Most competitions are judged based on aerobatic skill rather than speed--think figure skating versus short track speed skating--but all the elements are still there. People wrench on their helis just like they do on their cars, and look to squeeze every last bit of power and finesse out of them as they can.

Luckily for us, helicopter manufacturers have embraced the same ready-to-run concept that opened up the world of RC cars to a whole new group of people. Helis are available in three forms: build-it-yourself kits, Almost Ready to Fly (ARF) kits, and Ready to Fly (RTF) kits. Further, helis are generally classified as either aerobatic 3D-capable machines (those capable of complex aerobatic stunts) and more basic forward flight-only designs. This distinction is usually made between those helis that use fixed pitch blade systems, which rely purely on throttle inputs to control lift and descent, and and collective pitch helis that can alter the pitch of the blades as they rotate, creating lift.



The green aluminum head block draws attention to the NR3D's CCPM system, a fairly standard 3-servo setup that works well.

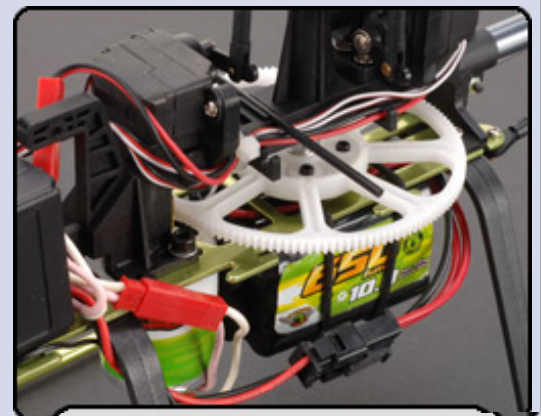
All of which brings us to the heli you see here, Venom's Night Ranger 3D. You probably recognize Venom from the car scene, and in the past year they formed Venom Air Corps and began releasing a few small helicopters under their name. Until now their most recent was the Night Ranger II, a slick-looking fixed pitch RTF kit aimed more at beginning or indoor pilots. Now, the Night Ranger 3D is here, a more advanced but similarly-sized heli that has all of the features necessary for aerobatic 3D flight. Like the NR11, the NR3D comes as a completely RTF kit, with everything you'll need to get up in the air. As a collective pitch heli it is a little more of a handful for novices, but it's a capable performer at any level, giving even advanced 3D pilots a fun time in the air.

DESIGN • The heart of any helicopter is its drive train and control system.

The Night Ranger 3D uses what's called Cyclic Collective Pitch Mixing, or CCPM. Three micro servos are mounted in the fuselage, and each attaches at 120-degree intervals to a piece known as the swash plate. The heli's electronic control unit mixes the signals from the transmitter to control the three servos, which in turn move the swash plate that controls the angle and pitch of the main rotor blades. The NR3D's tail drive system is very straightforward, with a fixed tail rotor controlled by the ECU. One of the excellent details of the Night Ranger's design is the exclusive use of adjustable rod/ball end links rather than 'Z'-bend hooks. It reduces slop and makes the heli much easier to work on.

MATERIALS • Chances are that you've seen a small electric heli at some point in your RC adventures, and chances are even greater that it was one of the garden-variety knockoffs that are made almost entirely of cheap molded plastic parts, maybe with a tiny bit of aluminum thrown in. However, the rigors of 3D flight demand a much more stable heli, and Venom has delivered just that with the NR3D. The main frame is anchored by a solid aluminum green-anodized chassis plate, and the main mast houses an aluminum head block as well. All of the heli's molded parts fit together well, with minimal slop out of the box. There seemed to be a little flex in the fuselage once everything was assembled, but given the heli's small stature I don't think this will be much of an issue.

ELECTRONICS • One of the advantages of a RTF or ARF kit is that they usually include most of what you need, and the NR3D goes above and beyond that. The Venom 3D Control Unit is the heart of the electronic system, handling the duties of the receiver, CCPM controller, gyro, and speed control all in one. Three micro servos are also included for the collective controls, as well as standard motors for the main and tail rotors. The NR3D package also includes a 6-channel FM radio, a 650 mAh NiMH pack, a wall charger, and even 8 pre-packaged AA batteries for the transmitter.



The fairly straightforward design houses the motor and battery just below the chassis plate, with a large spur to spin the main rotor.



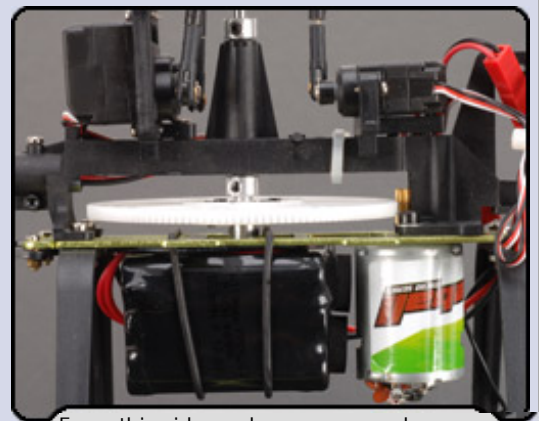
A 4-in-1 control device is included with the Night Ranger, handling the duties of the receiver, ESC, and gyro. It is easy to set up, and provided direct support for Venom's add-on brushless system.

INSTRUCTIONS • The Night Ranger 3D is geared towards a rather broad group of people, from novices on up to experienced 3D pilots who are looking for a little small-size or indoor adventure (note that when I say indoors, I am talking large areas like a warehouse or hangar, not your living room). As such, the instructions focus mainly on setting up the heli and performing various flight maneuvers, from basic fast forward flight to 3D moves like inverted flight and loops. In fact, the flight instruction section is one of the most informative I have seen anywhere; if you are a novice pilot, there's plenty to be learned just from reading it and examining the stick positions. Although the NR3D comes as a RTF kit, I still would have liked to see more detailed reassembly instructions; all that is provided is a small exploded parts diagram, along with some basic info. Still, the flight tutorials more than make up for it, and shouldn't be overlooked by anybody.

PERFORMANCE • Setting up the Night Ranger doesn't take very long, especially since the battery comes partially charged from the factory. I was able to make all the initial adjustments, set the trim, and bring the heli into a stable hover before I put the battery on the charger for a full charge. The instructions lead you through balancing, checking the blades' tracking, and adjusting the trim on the transmitter, and provide other various pre-flight tips.

Now it should be explained that I am by no means an expert pilot; I have only been doing this for a few months, and typically on a slightly larger nitro-powered bird. Larger helis are usually a little bit easier to master basic flight operations on since they are more stable, but I was surprised at how smoothly the NR3D took to the air. On my first try I was able to bring it to hover, perform basic "box pattern" flights, figure eights, and other simple maneuvers--basically the same stuff I have been practicing since I began my flight training. The Night Ranger maintained a higher head speed than I expected, and felt very strong out of the box, even with the stock motor and battery.

Although I'd love to pretend I'm an aerobatic pilot, I decided not to risk damage to the heli and brought in a friend of mine who has been working on teaching me how to fly. He went through the same basic flying patterns as I did before really unleashing the 3D capabilities of the NR3D. One of the "tricks" that allows 3D flight is a separate "Flight Mode" that holds the motor at a constant RPM to keep the heli in the air. When this mode is active, moving the throttle stick to the full down position has the same effect as full throttle, but while applying negative pitch. This is the key to inverted flight, where negative pitch creates lift when the heli is upside down. Like most helis, once the NR3D is in the air at a comfortable altitude, the pilot can flip a switch on the radio to change to Flight Mode 1, and initiate 3D flight. We were able to perform a few different tricks right off the bat, including inverted flight, rolls, and even a full loop. The NR3D was as stable upside down as it was right side up, although the responsiveness was a little less than we would have liked, almost assuredly due to the lack of a LiPo battery and brushless motor system.



From this side angle you can see how the 3-servo setup works to move the swash plate and operate the main blades.

WEAR AND TEAR • I wish I could say that I didn't break anything, but I must sheepishly admit that I did. One thing you'll discover when you enter the world of RC helis is that no matter how good you are, you will crash sooner or later--and when you do, you just have to pick up the pieces and get back at it. In my case, I let the heli move a little faster than I was accustomed to, and in a bit of midair panic I cut the throttle--definitely the worst thing you can do--and although I was able to somewhat save it, the heli came down hard on one side, and the main rotor hit the ground. The final tally was a broken landing skid, a broken pushrod link in the main rotor assembly, and a new pair of main blades. All in all, it could have been much worse! As I fixed the damage, I tore down most of the heli to check for other problems, and found

nothing. After at least ten packs through the heli, nothing seemed to be overly worn or binding, and I found no cracks or other problems. Once I repaired things, I re-set the trim and blade pitch, and was back in the air.



The tail rotor system is as simple as they come; a small motor drives the fixed-pitch rotor, with the throttle controlled by the control unit's built-in (and adjustable) gyro.

UPGRADES • Very few (if any) RTF kits include brushless motors and LiPo batteries, so these are probably the first things anybody would want to add to a heli such as the Night Ranger 3D. Luckily for us, Venom provided a sample of their brushless upgrade system, which plugs directly into the NR3D's control unit via a Y-harness. We also chose a MaxAmps LiPo pack to power the heli, although Venom offers packs for this heli as well. With the addition of the new power plant, the heli was a completely different animal. For a relative novice like me this was almost too much to handle, but in the hands of an experienced pilot it gave the heli a boost in responsiveness and acrobatic ability. The NR3D is by no means alone in this department; like every other heli on the market, a brushless system is a must-have upgrade for serious 3D flight.

with quite a bit of stick time behind me, I can say with authority that this is a great performer, especially given the price and the extras that come with it. If you've never flown a heli before, I'd recommend getting some time in on a simulator to familiarize yourself with the controls if at all possible, but if you are willing to take it slow and easy, the NR3D will suit a beginner just fine. For an intermediate pilot looking to get a first aerobatic heli, or a nitro pilot looking to give electric a try without breaking the bank, the Night Ranger is the perfect buy. As for me, you'll find me on the cliffs overlooking the Pacific Ocean on Sunday afternoons, practicing my flight skills with the Night Ranger.

Likes

- Complete package with (literally) everything you need to fly
- Great head speed and responsiveness out of the box
- Detailed flight tutorials included in manual
- All control links feature adjustable rods; no 'Z'-bends here!

Dislikes

- Would have liked to see a little more re-assembly instruction in the manual
- Nothing else comes to mind; the NR3D really hits its mark!

Scorecard

Features:		9.5
Fit and Finish:		9.0
Performance:		9.0
Instructions:		9.0
Value:		10

Tech Rating

9.5

what's in a rating? All products reviewed by R/C Tech are rated based on how well they fulfill their advertised goals and appeal to their target audience. Products are not directly compared to each other unless otherwise stated. For example, a ready-to-run car geared towards novices may receive a 10 in performance, but that does not mean that it would out-perform a competition-grade car that received a 9.5.

Have a comment about this review, or want to know something else about it? Check out the official [Venom Air Corps Night Ranger 3D thread](#) in the R/C Tech Forums.

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