# Bad Boy

# by Tom Watkins



#### **SPECIFICATIONS**

Wingspan:	53" / 1340mm
Length:	46.73" / 1187mm
Weight:	approx 4 Lb
Wing Area:	805 sq.in (5196 sq.cm)
Wing Loading:	12-13 oz. / sq foot
Engine:	.3250 2C, or .5672 4C OR EP Brushless motor
Radio required:	4 Channel
Servos required:	4 standard servos 1 micro servo for throttle
Price:	\$229



## INTRODUCTION

Precision Aerobatics Bad Boy V-2 is the second version of a very successful profile funfly aircraft released early last year. Precision Aerobatics is an Aussie company (located in Sydney area) designing their own line of high quality ARF models. The Bad Boy has been through many modifications and upgrades and is now available in two awesome colour schemes, blue and red.

BAD BOY

#### The Kit

The Bad boy kit arrived at my door undamaged. Wings were neatly packed in a strong box inside the larger box so the kit is safely shipped. I opened the box and inspected each individual part. All parts are cut accurately by laser and CNC machines. The covering is tight and nicely applied. Every hardware item you need to build the plane is included in this Almost Ready to Fly (ARF airplane) and the supplied hardware is very impressive. It is top quality heavy duty hardware that you don't see in kits on this category. The Bad Boy V-2 is a large 40 size profile plane. It has removable wings joined with carbon fibre wing tube. The ARF includes carbon fibre control horns for all the surfaces. Hinge slots for all surfaces have been pre-cut. The fuselage construction accommodates all extensions. It is apparent Precision Aerobatics have taken extra time and effort to produce an excellent ARF.

#### The Build

I first studied the well-written instruction manual to see if I understood everything. The manual demonstrate clearly each step with many photos. Construction began on the wings. The ailerons were hinged with cyanoacrylate (CA) hinges. PA website state that the hinges are also laser cut. First a straight pin was stuck in each hinge that was being used. This insured half of the CA hinge will be in the wing and the other half will be in the aileron when joining the two together. The pins were removed and 3 drops of CA glue was added to each hinge on both sides. Next came the installation of the carbon fibre control horns in the ailerons. The control horns have the awesome carbon fibre woven texture and are made by CNC. The installation consisted of milling a small slot in the necessary place and epoxing the horn in place. Hitec's new HS6635HB digital servos were installed in each of the wing halves. The ARF comes with extremely strong and lightweight carbon fibre push rods and the necessary items (extra large metal clevis and HD metal coupler) to make up your HD push rods. I measured the length from the servo output arm and surface control horn to get the necessary length of my push rods. The carbon fibre rods and the metal clevises were put together and hooked up to the servo and surface. With the HS6635HB servos and carbon fibre rods, there was no slop.

The wings were attached to the main fuse with the carbon fibre wing tube and three bolts and nuts. As I mentioned before the



plane has removable wing halves, which is a big plus mainly in transportation and storage. Next came the installation of the rudder and elevator servos, again the HS6635HB servos chosen. The servos are located in the tail end of the fuselage and the servo wires go through the fuselage. Threading the servo leads through the fuse body was a piece of cake. There is string already located in the fuse for you to tie your servo leads to and pull the leads through the fuselage. Once that was done, the vertical stabilizer was installed and checked to make sure it was perpendicular to the wings. After installation of vertical stab came installation of the horizontal stabilizers. I then hinged the rudder and elevator. Installing the carbon fibre horns in the surfaces was exactly like the ones on the ailerons and the construction of the control rods were the same as the aileron ones. The CNC aluminium landing gear that comes with this ARF is good, but I wanted to stick with the carbon fibre theme, so carbon fibre gear was used. I've been advised that Precision Aerobatics now offers carbon fibre (CF) landing gear and carbon fibre wheel pants as well as fibreglass. The CF tail wheel assembly is also easily installed (boy they like carbon ... ) You just bend the wire to the necessary length and bolt it on the bottom of the fuse. After mounting the wheels, I went a step farther and installed wheel pants on the plane, these of course are not included with the kit. The only thing left was to install the engine. A new OS 46AX was chosen. Installation was a snap. You just hold the engine on the fuse with clamps and adjusted the motor forward or back for centre of gravity (CG). I like to set my CG for a balance of pattern and 3D. Once satisfied, I drill the holes and bolted the engine to the plane. I used a Hitec HS 81 for throttle. The cut out for the throttle servo had to be opened to fit the HS8. Radio installation was a breeze. I made a small tray for my receiver and put it in the wing. A tray for my battery was made and installed, in the wing that was on the opposite side from where the motor fits. I used a Fromeco 1900mAh 2 cell battery and a Smartfly voltage regulator.

#### Carbon Fibre

Precision Aerobatics say about this kit (as well as some other kits of their design like the Katana mini 3D electric) "Carbon fibre everywhere!" I couldn't agree more: Other than the



wing tube and wing sleeves, the leading edge of the wing is also made of Carbon Fibre. You get Carbon fibre CNC machined control horns and CF tail assembly mounting plate, CF pushrods and CF servo arms are an upgrade option and are not include in the kit (personally I wouldn't skip them). I have chosen to install the carbon fibre upgrade out put arms for the servos. They were very easy to install on the existing servo arm/wheels. The CF arm is held on to the existing servo output wheel via 4 nuts and bolts. First, I centred the servos and found the closet setting on the wheel perpendicular to the servo. I centred the arm on the wheel and 2 of the pre drilled holes on the CF arm lined up. I then drilled the other 2 holes using the CF arm as a guide. The CF arms will allow for maximum throw. More than 45 degrees. getting 50 degrees of throw on the ailerons and elevator is possible, but I set mine to 45 degrees. These arms will give you all the 3D throw you need and can be tamed down for pattern flying.

## Radio Set-Up

My older Futaba 8U radio was used for this ARF. Programming was accomplished in a short time due to my familiarity of with this radio. 15 degrees of throw for the ailerons and elevator for low rate was programmed in the radio and 45 degrees for high rate ailerons and elevator was programmed. For the rudder I programmed in as much throw as I could get and cut that in half for low rates. Next came exponential. 30% expo on everything for low rates except the rudder was added. I put in 50% expo on low rate rudder and 70% expo on high rate rudder.

# Flying

The Bad Boy V2 is a joy to fly. Control surfaces are extremely large and designed to perform most extreme 3D manoeuvres. The huge wing area reduces wing loading and allows excellent "harriers". My engine was brand new, (OS 46 AX) so I ran it rich on the first flight. I gave the plane a once over and fired up the engine. I taxied the plane to the runway and added power and she went down the runway and rotated in about 50 ft. I added no trim what so ever on the maiden flight. This was a first for me with a profile airplane. My CG was set at the recommended place according to the instructions. I took it easy on the maiden flight, only loops, rolls, stall turns and inverted flight. The next flight I kicked it up several notches. Walls, waterfalls and Knife Edges were done with ease. In Knife edge flight, there was minimal coupling. You can mix this out, but it is so little that it is easily controlled just using the sticks. By far this is the easiest plane to hover I have flown to date. This is one sweet flying profile that will do it all. The Bad Boy V2 will make you look like a pro even on your first flight.

Review kit supplied by Precision Aerobatics, Sydney.



