

TEXT & PHOTOS BY JERRY SMITH

Precision Aerobatics

ULTIMATE AMR ARF

This high-energy, high-quality model is the ideal choice for biplane aficionados



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DESIGNED BY CANADIAN Gordon Price, the full-size Ultimate biplane started life as a set of replacement wings for a Pitts. It was optimized to provide two extra Gs in airframe loading and a much faster roll rate. Gordon thought, "Why not take it a little further and build a new fuselage, tail feathers, cowl and landing gear?" Thus, the Ultimate was born. During the 1980s, many were sold in kit form as the 10-dash series. Then came the more powerful 10-300 and the two-place 20-300 versions. Though never put into production, the Ultimate was a formidable competitor in the international aerobatic scene. Oddly enough,

Gordon's Ultimate biplane design gained more popularity as the RC model than the full-size aircraft ever did.

Precision Aerobatics' (PA) Ultimate AMR is a smaller look-a-like version of the full-size aircraft. It comes in two well-packed boxes. One for the wings and the other the cowl, landing gear, wheel pants, fuselage,

tail feathers and hardware; it's available in three different color schemes. Looking over the model, I was impressed with the thoughtful design features and the quality workmanship on the airframe parts. It's an ideal choice for the biplane lover looking for a model capable of precision high-energy 3D freestyle aerobatics.

SPECIFICATIONS

MODEL: Ultimate AMR ARF

MANUFACTURER: Precision Aerobatics (precisionaerobatics.com)

DISTRIBUTOR: Precision Aerobatics (precisionaerobatics.com)

TYPE: 3D aerobat

WINGSPAN: 40 in.

WING AREA: 582.4 sq. in.

LENGTH: 43.08 in.

WEIGHT: ready-to-fly with battery 38.45 oz.

WING LOADING: 9.5 oz./sq. ft.

POWER: Thrust 40

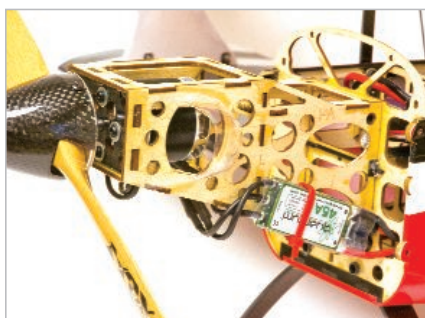
RADIO REQ: 6-channel, 4-22 oz. torque MG servos

PRICE: \$225

HIGHLIGHTS

- Great looks
- Strong, unique construction
- Easy to assemble
- Great flight performance





The motor box is pinned in place with carbon-fiber pins and then epoxied in place. The Quantum 45A ESC is secured to the side of box with tie-wraps for good cooling.

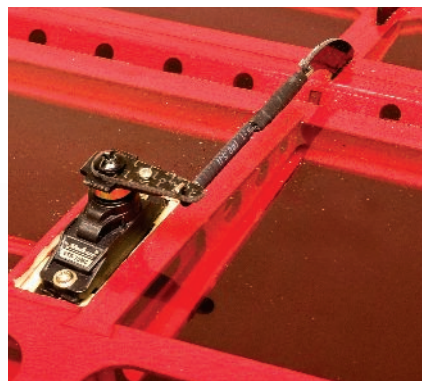
UNIQUE FEATURES

The PA Ultimate has many unique features, including an airframe that has Fiber Fusion reinforcement at all high-stress points and wings that are factory assembled before shipping for proper incidence, alignment

and fit. Each set of wings is matched to each fuselage. The Ultimate also has a unique aileron design that enhances aerodynamic control efficiency. All you need to do is bolt them on. The aileron and elevator control surfaces are pre-hinged with hinge gaps seals and the supplied carbon-fiber landing gear just bolts into place. The fiberglass cowl comes painted, precut and reinforced with carbon fiber. Painted fiberglass wheel pants are also included, but optional carbon-fiber pants, as well as an Ultimate-style carbon fiber spinner, are available separately. Even a control deflection gauge is supplied. There are more great features that are too numerous to mention. The assembly manual is the best I've seen!

The Ultimate AMR is a basic bolt-together airplane with very little glue required except for the motor box, stab and

control horns. The engineered FiberFusion construction method uses carbon fiber integrated into the balsa and lite-ply parts to create a very strong lightweight structure. When I installed the motor box and



Aileron servo with short pushrod linkage. Note Z-bends on both ends. Easy to set up, but get it right.

A REWARDING AND GREAT-FLYING AIRPLANE FOR THE ADVANCED PILOT





Carbon-fiber servo arm extenders and stiff pushrods promote better control response.

attached the motor, I used tie wraps to secure the Quantum ESC to the side of the box for good cooling. I used the iPAs Pro package for this review model (see sidebar).

The wings are built and covered to perfection and only need to have the control horns, servo linkage and servos installed. To build the linkage between the servo arms and control horns, I first centered the servos with my radio and then taped the control surfaces in their neutral positions. These linkages end up being very stiff and slop-free, exactly as PA intended. The cabane struts are made from carbon-fiber sheet stock and bolt together. The inter-plane struts are covered, built-up assemblies and are bolted to carbon-fiber lugs in the

CONTROL THROWS

AILERON: $\pm 3/8$ in. up and down, 35% expo (low); $\pm 13/16$ in. up and $1 1/16$ in. down, 5-percent diff., 70% expo (high)

RUDDER: $\pm 2 1/4$ in. left and right, 35% expo (low); $\pm 3 7/8$ in. left and right (max), 70% expo (high)

ELEVATOR: $\pm 1 1/4$ in. up and down, 30% expo (low); $\pm 2 13/16$ in. up and down, 70% expo (high)

GEAR USED

RADIO: Spektrum DX7, AR6200 receiver (horizonhobby.com)

SERVOs: 4 Voltec VTS-70MG servos (voltecservos.com)

MOTOR: Thrust 40 Outrunner (thrustmotors.com)

ESC: Quantum 45A (precisionaerobatics.com)

BATTERY: 2200mAh, 3 cell LiPo (precisionaerobatics.com)

PROP: VOX 14x7 wooden prop (voxprops.com)



In the Air

The Ultimate was off the ground in short order. After reaching altitude and level flight, only a slight amount of downtrim was needed. I flew the model on low rates around the field at about three-quarter throttle until I was satisfied with the trim. At 175watts/pound, the Ultimate is very lively when throttle is applied and it has some great vertical performance. The first landing was a grease job and I was very pleased with my first test flight.

GENERAL FLIGHT CHARACTERISTICS

Stability: The model showed no signs of instability, even at slow speeds. The plane doesn't do anything unexpected. Low power landings are easy to perform. Keeping in mind that this is a light airplane, some power is required.

Tracking: The Ultimate goes where you point it. Knife-edge took a little trimming adjustment with a slight amount of up-elevator needed. It took very little trim to fly it straight hands-off.

Aerobatics: This is where the Ultimate is a shining star in the sky. I put it through several maneuvers and was surprised how effective the four ailerons are on this biplane. On low rate, rolls are still exceptionally fast. It will spin cleanly without the use of ailerons and snaps were exceptionally crisp. Knife-edge required some up-elevator mixing to hold direction, but was easy to do. High rate on the elevators, as specified in the manual, will let you do harrier maneuvers, but with some noticeable rocking. Overall, it's an excellent aerobatic airplane.

Glide and stall performance: The model will slow fly well and stalls are very gentle. It will start flying as soon as air speed is increased. It glides well, but since it's a biplane with more drag, it's best to keep a little power, especially in a headwind, to keep it penetrating.

PILOT DEBRIEFING

I'm thrilled with the Ultimate's performance. It's a cool-looking model that turns heads at the field. Add in the easy assembly, carbon-fiber reinforcement and the quality workmanship with great performance, and you have it all. My test model came in at the advertised weight and I didn't have to add any weight to balance it. Not intended for beginners, the Ultimate is a rewarding and great-flying airplane for the advanced pilot.

wings. The fuselage battery mount is reinforced with carbon fiber and the manual provides the exact battery placement for proper CG.

The canopy is held in place with two large rare earth magnets in the rear and two smaller ones further forward. It closes nicely with a positive snap! I was not impressed with the way the tailwheel fastens to the rudder, so I made a slight modification here. I drilled a $\frac{3}{16}$ -inch hole where the bent wire would normally go into the balsa, and glued in a short dowel. I drilled a hole in the center of the dowel, then I epoxied the tailwheel wire into place. The dowel gives the wire much better support.

CONCLUSION

Built for hardcore 3D pilots, the PA Ultimate will also reward sport pilots with its easy flying airframe, as well as its precise control response. A well-thought-out airframe has many unusual features, with excellent craftsmanship thrown in. You won't go wrong with the Ultimate AMR. It's a keeper! ✚



THE ULTIMATE PACKAGE

Precision Aerobatics offers all the required components, known as the Integrated Performance Airframe-Drive System (iPAs), for a complete model package. All the iPAs equipment has been thoroughly tested to ensure it's a perfect match to the Ultimate airframe and all the other components.

The heart of the iPAs is the Thrust 40 outrunner motor and the Quantum ESC. The Thrust 40 incorporates RotorKool and is one of the coolest running, high-performance, high-efficiency motors produced today, provided there is sufficient airflow. Powered by a 3-cell 2200mAh LiPo pack, this 850kV motor easily swings a 14x7 prop. The fully programmable Quantum 45A ESC is a performance-enhanced brushless controller with BEC designed by PA. It's a seamless match with the Thrust 40, provides a smooth throttle curve and is able to take the high-voltage peaks during high-energy 3D maneuvers. It is geared for one thing: performance.

Also designed by PA, the precision 5mm prop adapter is CNC-machined and made specifically for the Thrust 40 motor. It spins perfectly centered to reduce vibration. Other custom iPAs packages are also available.



CATCHING UP WITH JERRY SMITH

Jerry Smith has been a *Model Airplane News* contributor for many years and he has also covered several national RC events for us. His photography is outstanding and he always delivers exciting images for his event reports. We caught up with Jerry recently and here's what he had to say.

Jerry, you have been involved in the hobby for a long time. Could you tell us how you got started and a little bit about your first successful RC model?

Jerry Smith: I started building model airplanes at the age of 10 and they have always been my passion. My first RC airplane was a Goldberg Falcon 56 powered with a Fox .19 and flown with a Citizenship radio. As I remember, I didn't have it too long because it went through a tree and was demolished. That was back in 1958. My second airplane was a Bill Winters Krackerjack; that one had better success and flew great. I have been flying RC every since.

You're a well-established magazine writer and photograph many RC events. What's the secret to getting the amazing photos that you do? What type of camera do you use?

JS: Photography is my second hobby and when I combined it with RC models, I got the best of both worlds. At the moment, I use a Nikon D300 SLR. Taking good flight shots requires an acquired skill of motion, light and practice. I generally shoot a burst of 4-6 shots at a rate of five frames per second. I overshoot generally and this gives me more choices. Since going to digital, I have done much better, but it takes failure first, then practice and more practice to be good. Turbine jets are the hardest to shoot.

What's your take about the development of the RC hobby?

JS: I have been fortunate to live through and use most of the RC technology as it has grown through the years. And what we have today is the very best in reliability, miniaturization and quality. Hang on, it's only going to get better and better!

DID YOU KNOW?

After retiring from the aerospace industry and moving to Georgia, Jerry went to work for Lanier R/C. He designed RC airplane kit plans with CAD, built prototype models and wrote several instruction manuals. He designed all five of the Lanier R/C Stingers and worked at Lanier R/C for 15 years!