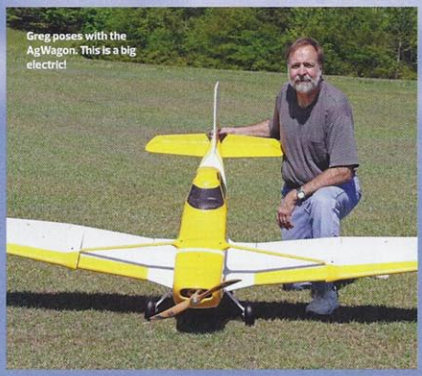
Pilot Report

RC Guys

AgWagon Cessna 188 ARF

A giant-scale crop-duster goes electric

by Greg Gimlick



Greg poses with the AgWagon. This is a big electric!

Specifications

Model: Cessna 188 AgWagon
Manufacturer: RC Guys (rcguys.com)
Type: Giant-scale ARF
Wingspan: 97 in.
Wing area: 1,256 sq. in.
Ready-to-fly weight: 18 lb.
Wing loading: 33 oz./sq. ft.
Length: 62 in.
Motor req'd: Rimfire 50, E-flite 160, or Hacker A60
Radio req'd: 5-channel w/ 6 servos
Price: $489

Highlights

- Exceptional build quality
- Great flight characteristics
- Excellent flap characteristics
- Roomy battery access

Gear Used

Radio: Futaba 14SG transmitter, 7008SB receiver (futaba-rc.com); (4) Hitec HS-5665MH servos, (2) Hitec HS-5495BH servos for flaps; NoBS Batteries 2300mAh A123 receiver pack
Motor: ElectriFly Rimfire 50cc outrunner (electrifly.com); Castle Creations Ice HV-160 speed control (castlecreations.com)
Battery: Revolectrix Diamond Label 60C 6S 5000mAh LiPo (amainhobbies.com)

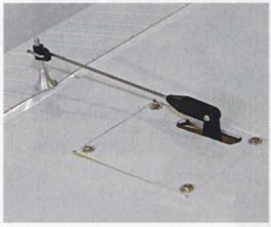
In the 1960s, Cessna expanded its line of light aircraft by entering the agricultural aircraft market. The resulting aircraft was a conventional single-seat, piston-powered, strut-braced, low-winged agricultural airplane. Although the main use for the Cessna 188 series was agricultural, many were later purchased for use as glider and sailplane tugs. Fortunately for those of us who enjoy giant-scale airplanes, RC Guys brought their version of the AgWagon to market and it's a real attention-getter. The recently released new version has some changes that make it ideal for an electric conversion. This model is built-up construction of laser-cut ply, balsa, and perfectly applied covering. All hardware is included and the quality of it is very good. This airplane would be suitable for anyone looking to get into his or her first giant-scale model if he or she has intermediate flying skills.

SWOOPING UP AT THE END OF THE FIELD AND KICKING IN THE RUDDER TO ROTATE IT AROUND THE VERTICAL TO RETURN FOR A SPRAY PASS DOWN THE FIELD IS A THING OF BEAUTY.

effect on the long standoffs holding the motor. He built the mount and drilled them for the bolts so I just glued it to the firewall as I bolted the motor in place. Large motors and big props produce a lot of torque so take that into account when you do yours.

CONCLUSION

This is an excellent subject for converting to electric power. The quality of construction, along with the ease of access to the interior, leads one to believe it was designed for this possibility. If you're looking for a giant-scale plane that's not like all the others at the field, this is a great choice. It can fly like a trainer, but with the power available, it will do anything you want it to. I hope to be flying this one for years!



Aileron servos are attached to the cover plates in the wings.

In the Air

The big Rimfire 50 and A Main Hobbies Revolectrix LiPo pack provides incredible power to turn the gorgeous Vess 19B prop with authority! With the big wheels and exceptional clearance, flying from grass fields is easy. I set the flaps up on a three-position switch so I can select the degree of flaps desired and they work great. With full flaps, it slows to a crawl for landing. I did most of my flying on high rates and liked it that way, but the low-rate settings are adequate. My final flap settings are a bit more than the high-rate recommendation.

GENERAL FLIGHT PERFORMANCE

Stability: The AgWagon has a significant amount of dihedral built into it for great stability. The mission of the airplane was to haul a lot of weight around in the spray tank while doing slow passes down a field and quickly "returning to target" for the next pass. The design of the wing and large tail surfaces provides this ability while remaining stable.

Tracking: It tracked beautifully with no surprises in the air, and take-off/landing runs were straight and true. The rudder has plenty of authority to handle take-off runs and I find it's best to ease into the throttle for a scale-like takeoff rather than just firewall the throttle. The tail comes up quickly and ground tracking is solid with rudder.

Aerobatics: Nothing in the mission profile of this plane says it's aerobatic, but it certainly can be. The biggest surprise was the ease at which it flew inverted in spite of the dihedral. The next would be the axial nature of its rolls. Loops can be as big and round as you wish. The plane has so much power that maneuvers that were never intended for an AgWagon can be done, but the fun is in flying it scale-like. Swooping up at the end of the field and kicking in the rudder to rotate it around the vertical to return for a spray pass down the field is a thing of beauty.

Glide and stall performance: Stalls were gentle, but if carried deep enough into it, mine would break to the side quickly. Recovery was almost instant by relaxing the elevator and flying out of it. I had to force it to go to this extent. With a wing loading of only 33 oz./sq. ft., dead-stick approaches are easy and control authority remains solid. The glide angle is comfortable and with the addition of flaps, it can be as gentle as a trainer to land. Flaps required just a tad of elevator, but not enough that I felt it necessary to set up a mix for it.

PILOT DEBRIEFING

This plane just begs to be electrified and the new version makes it easy! It's a big gentle, sort-of-goofy-looking scale plane that just makes you smile when you fly it.

BY DAVID R. VAUGHT ■ PHOTOS BY DAVID L. VAUGHT

RCGuys.com

AG WAGON CESSNA 188

A solid plane that's built to fly like the original

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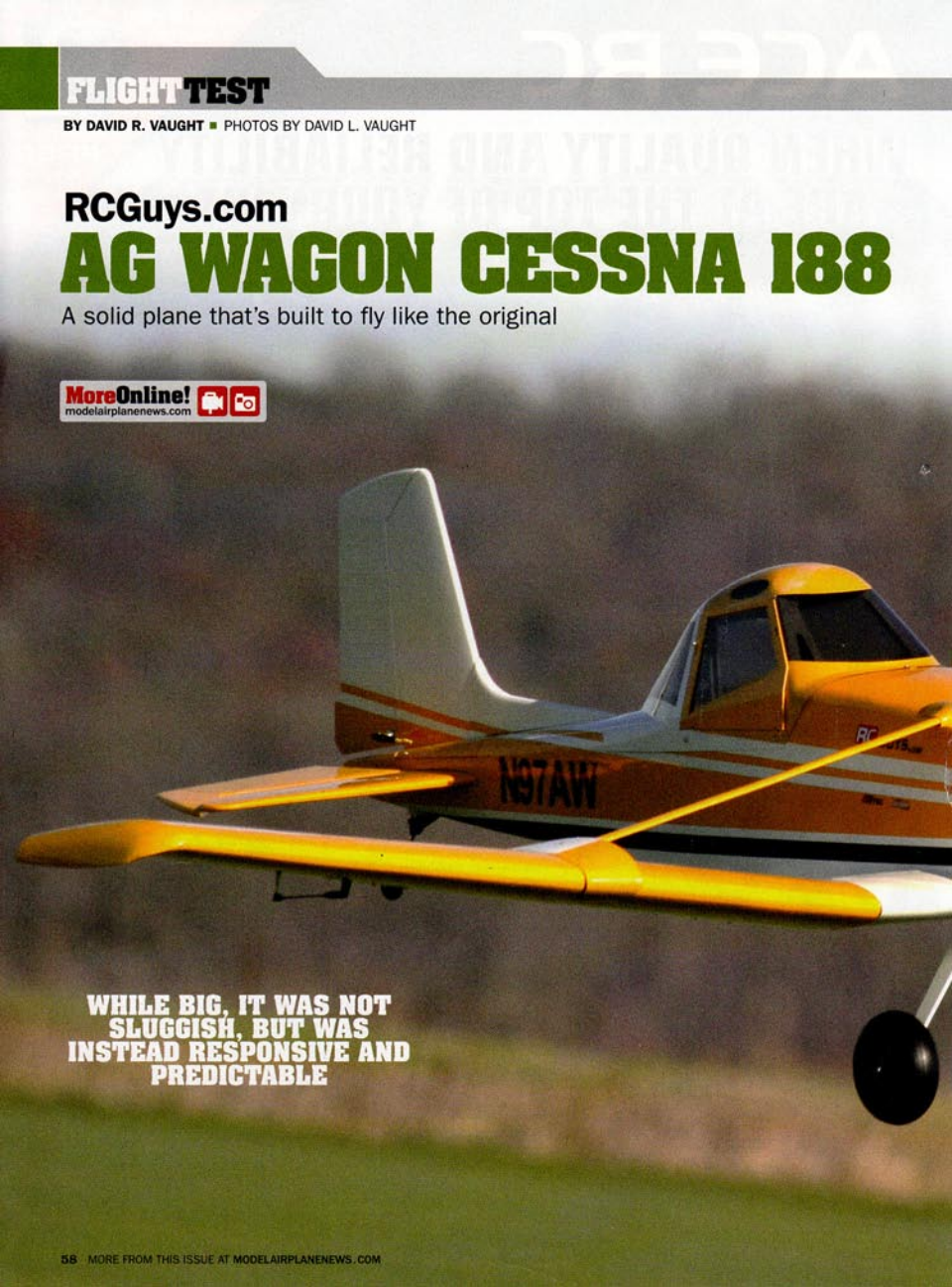


WHILE BIG, IT WAS NOT SLUGGISH, BUT WAS INSTEAD RESPONSIVE AND PREDICTABLE

MANY TIMES WHEN DESIGNERS create planes, I think their efforts are directed at getting the plane to look like the original. RCGuys.com have gone one step further and designed a plane that not only looks like the real deal, but also flies like the original. As I flew their replica of a Cessna 188 Ag Wagon, I imagined I could see the trees coming up on the end of the crop row as I pulled and buried the stick to the side, stepped on the rudder and pivoted the wing on a spot the size of a dime.

Built with fiberglass, balsa and lite-ply and covered in a beautiful yellow, black and white color scheme, the big Ag Wagon is eye-catching—not just in the color scheme, but also for its unique style. Detail is everywhere and the features include a functional pilot door, painted wing fairings, powder-coated, heavy-duty aluminum landing gear, steel wing struts and realistic corrugated control surfaces.

Designed for giant scale, the Ag Wagon still flies with trainer-like control. For anyone wanting to move to a larger gas plane, you get it all in RC Guys' latest offering. The Ag Wagon has big-scale looks, docile flight characteristics and stability on the ground and throughout the landing sequence.

SPECIFICATIONS

MODEL: Ag Wagon Cessna 188
MANUFACTURER: RCguys.com
TYPE: Low-wing crop-duster
WINGSPAN: 97 in.
WING AREA: 1,256 sq. in.
LENGTH: 62 in.
WEIGHT: 16.5 lb.
WING LOADING: 32 oz./sq. in.
RADIO REQ'D: 5-channel w/ 7 servos
POWER REQ'D: 23-40cc gas, 120-170 4-stroke, 90–160 2-stroke
PRICE: $439

HIGHLIGHTS

- Great scale appearance
- Outstanding ground and flight handing
- Details like the operational door and control surfaces
- Potential to handle extras

In the Air

GEAR USED

RADIO: Hitec Optic 6 w/D-07RH QPCM receiver, HS985MG servos (aileron), HS645MG (flaps 2), HS475BB (throttle); (hitecrcd.com)

ENGINE: SPE-43 (cermark.com)

FUEL: Gas/oil mix at 25:1

RECEIVER BATTERY: 3000mAh 4.8V NiMH; ignition battery: 2500mAh 6V NiMH

PROP: Master Airscrew 20x8 (masterairscrew.com)

The SPE-43 engine turned a Master Airscrew 20x8 propeller and moved the Ag Wagon with authority. Even though specifications are for 23-40cc gasoline engines, the SPE-43 was not at all overpowering. I used the included 35mm standoffs, but in hindsight, I wish I had used ones that were 5mm longer. Anything you can do to cantilever weight ahead of the firewall is to your advantage. I needed to add 2.5 pounds of lead next to the firewall to achieve the proper CG. Half of that was likely attributed to my placement of the elevator servo.

I placed the receiver as far back as possible on the electronics platform and routed the antenna down through the bottom of the fuselage. Programming with the Hitec Optic 6 and QPCM receiver for flaps, aileron differential and exponential also supported my success with the Ag Wagon.

CONTROL THROWS

RUDDER: ± 1 ½ in. (low), ± 2½ in. (high)

ELEVATOR: ± ¾ inch (low), ± 1¼ in. (high)

AILERONS: ± ¾ in. (low), ± 1¼ in. (high)

FLAPS: ± 0 to 1¼ in.

GENERAL FLIGHT PERFORMANCE

Stability You have to admire a plane that can handle the weight and execute steep turns. I thought axis control was excellent. While big, it was not sluggish, but was instead responsive and predictable.

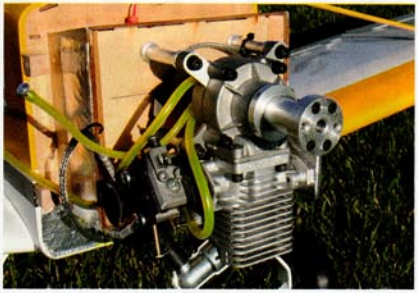
Tracking Executing steep turns requires rudder to bring the tail around. Otherwise, I really did not have to trim much on my initial flights, nor did I have to make any adjustments between flights. An overall good design is realized in a straight and controllable flight path.

Aerobatics As I mentioned, the dihedral slows the response down a bit. Inverted flight tends to want to roll back over. The dihedral is there for those steep turns, not aerobatics.

Glide and Stall Performance This is where the big Ag Wagon excels. Stalls are there, but fall forward with little wing drop. Power-on stalls are difficult to achieve; the break is delayed but the nose will drop. Glide slope is excellent. On final approach, the descent is consistent and very little stick management is necessary. It did not seem to matter if you landed dead-stick or with power. The big, soft rubber tires cushion landings but don't bounce.

PILOT DEBRIEFING

The Ag Wagon is not a plane that requires quick thumbs and reaction times. Its flight characteristics are consistent. In spite of my need to add 2.5 pounds, the huge wings and low wing loading created a well-behaved aircraft that is responsive to pilot inputs. It is fully maneuverable, but something about flying the Ag Wagon through aerobatic sequences seems out of place. Rather, low passes and steep turns are where this crop-duster shines.



The SPE-43 engine weighs in at about 3 pounds, fits under the cowl perfectly and provides plenty of power for the Ag Wagon.

The 6x5-inch belly hatch is your portal to fuel tank, receiver, rudder and throttle servos. Note the wing spar tube and receiver placed under the tube.

UNIQUE FEATURES

The wing is two-piece and uses one bolt to attach each half to the fuselage. While the wing has an extra dihedral for the outer portion, this joining process is already complete. All control surfaces require hinging and use fiber CA-type hinges. The tail requires gluing, which is really the only component that needs glue.

Once framed, the details require some attention. The large canopy is painted, smoked plastic and you have the option of including the operational door. If you want to install the door, you'll have to lay out the opening and make cuts in the canopy. What you remove will become the door's window. The plastic is flexible, but not flexible enough to cut with scissors. You need a sharp hobby knife to work your way through the canopy. Be careful not to chip the paint as you cut. The door frame is internal to the canopy.

The cowl is huge and easily allowed the placement of the SPE-43 engine. I did need to remove some of the cowl for the cylinder head, exhaust and intake. I was also able to install the ignition and battery on the motor mount. Because of potential heat buildup, I insulated the ignition components with exhaust gasket material and placed a layer between the exhaust and the engine mount.

Included in the kit are flaps controlled by two different servos. The rudder uses a pull-pull system, while the elevator can use either a tail-mounted servo or a forward mount that uses the supplied carbon pushrod. A word of caution though in using the tail-mounted servo—even a seemingly slight 2 ounces of weight can move your CG back and require as much as 8 to 10 ounces of weight up front to compensate.

Finally, working inside the Ag Wagon is an exercise in manual dexterity. The only way into the fuselage is through the underside. Make sure you have a sturdy working stand because you will be turning the plane over and over throughout the setup. I found almost all of my efforts had to be done one-handed. Have you ever tried to join a zip-tie with one hand? To complicate matters, the wing-spar tube runs through a portion of the opening and on top of the electronics deck. You will also find yourself walking from side to side to get the right bend in your hand to install everything inside the fuselage. I used the hatch to mount my ignition and radio switches.

CONCLUSION

Other than the tight access to the electronics, I found all aspects of this project to be positive. I recommend you use 24-inch servo extensions for the outer aileron servos and at least 12-inch extensions for the flap servos. I always use AeroWorks (aeroworks.net) safety clicks to ensure my connections. I know many of us invest large amounts of time with projects, not for the build, but for the extras. The Ag Wagon is a perfect project plane. ✚