TEXT & PHOTOS BY JOHN REID

RCGUYS.COM

PITTS SPECIAL S1

Classic biplane looks, topnotch performance

The Pitts Special S1 is, without a doubt, one of the best aerobatic biplanes. The good folks at RCGuys.com stayed true to the original's great outline and style, and this "exact 33% scale ARF" was developed from the late Andy Sheber's drawings for the Pitts production facility. But can a scale beauty make it as an outstanding aerobatic performer? I am happy to report that it can. The RCGuys' Pitts Special has the same great outline as the full-size aircraft and a fantastic color scheme, and it's among the easiest biplanes to fly. And there's more: this scale plane can tumble across the sky in aerobatic gyrations that would delight any diehard Edge 540 or Extra 330 pilot. You will never get tired of flying the Pitts Special S1.

THE KIT

The kit was beautifully packaged in a box with compartments that ensured that nothing would be damaged during shipment. Supplied accessories include a canopy, landing gear, wheel pants, wheels, tail-gear assembly, decal sheet, cabane and wing struts. The hardware package is complete and includes just about everything you'll need to assemble the Pitts, and there's a 23-page instruction manual.

CONSTRUCTION

Wing assembly. Following the instructions, I started with the wings, which took only an evening to complete. On the top and bottom wings, I cut the covering over the slots where the wing hold-down tabs go. I glued

THIS PLANE ROCKS! IT'S A VERY EASY TO BUILD, GIANT-SCALE, FULLY AEROBATIC BIPLANE THAT REALLY GETS YOUR HEART POUNDING

the tabs in with 30-minute epoxy. The top wings are glued together with a wing joiner; again, I used BSI 30-minute epoxy. I placed the bottom wing on the fuselage and marked the position of the belly pan. Then I removed the covering where the pan sits and glued the pan onto the wing. Next, I installed the four ailerons, and this went quite quickly. No real tricks here: grease the knuckle of the hinge point, put glue inside the precut holes for the hinge points and insert the hinge. I let the glue dry and was then ready to start on the linkage.

All the linkage dimensions are given in the instructions, and they're accurate. There are some long bolts for the control horns; use these near the ailerons' hinge line. Instead of wood, RCGuys.com decided to use a carbon-fiber pushrod for the connection from the bottom aileron (where the servos are) to the top wing. I cut the pushrods to the proper lengths and glued threaded ends to them with CA. This assembly works quite well and is very strong. The wing struts and cabane are firmly attached with 4-40 bolts and, like the linkage, are easy to disassemble—perfect for transporting the plane to and from the field.

Fuselage. Assembly begins on the bottom with the landing gear. First, I attached the tailwheel bracket to the rear, and then I bolted on the main gear. The large wheel pants use two 4-40 bolts to keep them attached fairly well to the gears. Be sure to use Loctite on all of the bolts.

I removed the covering from the cutouts for the stabilizer and fin and some of the servos. Because I planned to install a strong Revolution 50cc motor, I wanted plenty of movement and power for the elevator. Instead of the pushrod and control horn for a one-piece elevator provided in the kit, I decided to use two servos—one for each elevator. To do this, I made servo cutouts in the corresponding spots on opposite sides of the fuselage. Inside the fuselage, I reinforced the cutouts with plywood backing plates that span the fuselage support stringers. I used Du-Bro heavy-duty control horns for the rudder and elevators and ball links on the elevator servos with 4-40 pushrods.

I squared the stabilizer with the fuselage and the bottom wing. With everything

I glued on a simple wood bracket to the firewall and mounted the F1 fueling system from Slimline to it. I have an identical one mounted on the bottom of the plane for the overflow line.

I customized the servo-mounting plate a little to allow more room for installing the tank. The Pitts Special S1 has more than enough room for all of the radio gear.

lined up, I marked the stabilizer and removed the covering from its center section. Using BSI 30-minute epoxy, I set the stabilizer back into place, cleaned off the excess epoxy and rechecked its alignment. When the epoxy had hardened, I attached the fin using the same method and made sure that it was at 90 degrees to the stabilizer. With the tail feathers in place, I moved on to installing the engine.

Engine & cowl. To install a Revolution Rev-50 (50cc) gas engine, I followed the manual's systematic instructions. The firewall is not attached to the engine box and is installed after you've fitted the cowl temporarily on the fuselage and obtained the proper measurements for the engine's location. I added the recommended 3 degrees of right thrust and downthrust and used 30-minute epoxy to secure the firewall in place. I used epoxy and balsa triangle stock on the front and back of the firewall for extra support. When the epoxy had cured, I made cutouts in the firewall for the throttle pushrod and installed a bellcrank on the rear side of the firewall for the choke. I made all the necessary cutouts in the cowl and installed it using the bolts and blind nuts provided for this.

Fuel system. I used a 20-ounce Du-Bro converted gas tank to provide about 20 minutes of flight time. I mounted the tank on an ⅛-inch plywood platform using hook-and-loop fastener and zip-ties. With the tank completely assembled (including the fuel lines) and firmly attached to the platform, I epoxied the unit to the front two fuselage formers. I used the F1 fueling system from Slimline for the feed line (for refueling) and also for the vent line. This allows me to close the system completely and prevent any smell of gas escaping inside my van when I transport the plane.

SPECIFICATIONS

MODEL: 33% Scale Pitts S1 ARF

MANUFACTURER: RCGuys.com

TYPE: scale sport ARF

LENGTH: 62 in.

WINGSPANS (top/bottom): 68⅜/65¾ in.

WING AREA: 1,572 sq. in.

WEIGHT: 16 lb.

WING LOADING: 23.45 oz./sq. ft.

ENGINE REQ'D: 1.20 to 1.60 2-stroke, 1.8 to 2.20 4-stroke, or 25 to 40cc gas

RADIO REQ'D: 4-channel with 5 servos (aileron [2], elevator, rudder, throttle)

PRICE: $399

HIGHLIGHTS

» Quick build

» Easy biplane to fly

» Durable

GEAR USED

RADIO: JR 10X transmitter, R 945S receiver, JR 8411 servos (ailerons, elevator, rudder); NES-537 servo (throttle)

ENGINE: Revolution Engines Rev-50

PROP: Xoar 22x8

Compact power

For the RCGuys.com Pitts Special S1, I decided to use the new Revolution 50cc engine. It offers compact size and reliable performance with a lot of power. I like this engine for the Pitts because it fits completely inside the cowl. The only parts that extend outside the cowl are the prop shaft and the muffler pipes.

The Rev-50 boasts impressive specification numbers. The displacement is 3.2ci, which actually makes it a 52cc-size engine that produces an impressive rated horsepower of 5.7. The best part is that the engine delivers that much power while weighing in at only 51 ounces.

The engine comes with a nicely designed mount that makes installing it easy. The mount is connected to the rear of the engine and surrounds the carburetor so that it will protect it in a crash. It does make for tight access around the carburetor, but everything is well laid out and works well within this "cage."

Every Revolution engine is test-run and tuned at the factory, and this becomes obvious on the first flight. I installed the engine in the Pitts and went to the flying field without running the engine beforehand. It took about 15 flips with the choke on to draw the fuel in, and then the engine sprang to life. I adjusted the idle with the throttle-trim tab, and on the first flight, with no adjustments, the engine had no problem pulling the plane through the air; the Pitts did just about unlimited verticals. This is a fine engine, and it's quite a deal at $549.95. If you have a scale 50cc plane in need of a powerful engine, you can't do better than this.

The compact size of this motor allows me to conceal all of it within the Pitts' cowl. Other than the driveshaft, the only part that extends outside the cowl is the tip of the Pitts-style muffler.

Radio installation. I again used BSI 30-minute epoxy to attach the servo tray to the fuselage, and then I installed the rudder and throttle servo. I installed two switch harnesses—one for the motor and the other for the radio system. After wrapping the battery and receiver in foam, I used zip-ties to secure them on the servo tray; I then hooked the pull-pull system up to the rudder, and I had finished installing the radio.

Final assembly. I balanced the plane by moving the battery and receiver around in the fuselage. I set the control throws to the manufacturer's recommendations and added the decals. My 33% Pitts Special S1 was ready to tumble across the sky.

FINAL THOUGHTS

This is a great-looking plane, but the Pitts S1 ARF's scale looks aren't the only thing it has going for it. Its outstanding flight envelope will give you many hours of flying enjoyment. This is one biplane I really enjoy flying, and it's the easiest biplane to land I have ever flown. Give one a try; you'll be glad you did. ✢

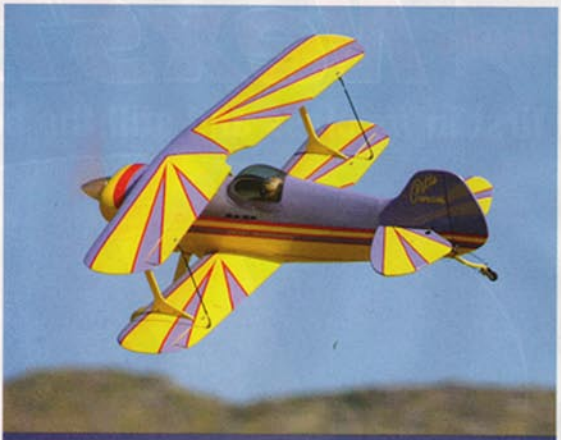
See the Source Guide on page 152 for manufacturers' contact information.

The Pitts—*your* way

Our good friend Sal Iasilli built the RCGuys.com Pitts S1 ARC (almost ready to cover) kit. Check out the complete review of this great kit online at modelairplanenews.com.

Sal writes: "The kit arrived in a large corrugated box with separate compartments containing the wings, tail and fuselage wrapped in foam and plastic bags. The framed-up wings, stab, elevator and fuselage required only final sanding before they were ready for covering. The fiberglass cowl and wheel pants are gelcoated in white.

"The RCGuys.com Pitts handles like a true thoroughbred from takeoff to landing. Tracking was straight and level with a great flight performance. The DA-50 provides all the power I needed and more, even though most of the time, I was flying at ½ throttle."



In the Air

The Revolution Rev-50 is perfect for this 33% Pitts. It's light, and its powerful performance really pulls this plane along. It takes very little throttle to get the Pitts into the air. Too much power on takeoff will torque it over. But it's cool to pull it into a vertical climbout for as long as you want it to go straight up. I've flown the plane in a 15mph wind without a problem; landing straight into the wind helped to slow the Pitts down for landing.

CONTROL THROWS

ELEVATOR: ±3 in.; expo: 60% (high): ±1½ in. (middle); expo: 35%; ±¾ in. (low); expo: 25%

AILERON: ±1½ in.; expo: 60% (high): ±1 in. (middle); expo: 50%; ±¾ in. (low); expo: 25%

RUDDER: ±4 in.; expo: 60% (high): ±2 in. (middle); expo: 50%; ±1¾ in. (low); expo: 35%

GENERAL FLIGHT CHARACTERISTICS

STABILITY. At all speeds, the RCGuys.com Pitts Special S1 feels solid and exhibits good control and quick responses.

TRACKING. Rudder control is absolutely needed on the ground, but the Pitts isn't hard to control. Once in the air, the plane goes where you point it.

AEROBATICS. Outstanding!

GLIDE PERFORMANCE. I only had to deadstick it in once (my fault, ran out of gas), and it was a creampuff to land.

STALLS. Like all biplanes, it will stall if you slow it down too much, so avoid doing that. But if you do, bring up the power and the Pitts will be flying again.

PILOT DEBRIEFING

This plane is really fun to fly; it has excellent maneuverability and straight and true flight. RCGuys.com did a nice job on this scale ARF. Good looks and a great flight envelope make a winning combination. As you can see from my control throws, I have some 3D rates that are a blast with this plane. It does all the IMAC maneuvers and a really nice knife-edge. It can fly high-alpha maneuvers, but you have to be careful to stay on top of it all the time. Spins, flat spins, spirals, knife-edge spins, snap rolls and tail slides are easy to do and look great with a biplane. But the Pitts really excels when doing tumbling maneuvers. Thanks to its short fuselage and generous control surfaces, it will tumble through the sky like nothing else. Do a Lomcevak, and you'll be grinning! If you like scale biplanes and aerobatics, this is the one you want.

Big, beautiful and fun to fly!

RC GUYS 33% Pitts S1 ARF

by Andrew Coholic

Anyone who has been involved in this hobby for some time has probably tried to fly a biplane. If you happen to have tried to fly a model of a Pitts Special, you'll appreciate how excited I was when given the chance to review RC Guys' third scale Pitts S1 ARF. Not having had a biplane in my stable of models for a few years (my last one was a Pitts), I couldn't wait to get started.

The Pitts arrived double boxed. Inside, the components—four wing panels, a fuselage, cowl, empennage, canopy, hardware, etc.—were all carefully bagged and wrapped in foam.

This model is built to "exact scale" S1 plans drawn by the late Andy Sheber and based on Pitts factory drawings. The very nice yellow, mauve and red covering showed just a few wrinkles. Few kit-built planes have such nice covering jobs. All the lines were straight and symmetrical and matched up with the painted cowl nicely. The balsa and light-ply interior structure looked well machined and glued together. Nothing was too heavily built, yet it looked as if it was designed with strength in the right places such as at the front end, the landing-gear section, etc. The tail components were truly flat. This product has the quality of a great kit-built model and might be better than any other ARF I have assembled. I was impressed by the quality.

The Pitts ships without a manual. This may seem strange, but RC Guys maintains an up-to-date online manual on its website. After printing the 20-plus pages and reading them through a few times, I was ready to start assembly.

PHOTOS BY ANDREW COHOLIC

ASSEMBLY & HARDWARE

Assembling the Pitts is straightforward. The manual suggests which adhesives you should use to fasten the various parts (epoxy, CA, etc.), but more than one type will do a good job. The wing halves are joined using epoxy and two wooden joiners, which fit very well.

Covering strips are provided to go around the center section. The upper wing also has a plywood section that's attached to the cabane, and the lower wing has a "two dowel and two bolt" attachment, and the corresponding holes in the fuselage bulkhead have already been drilled. A frame-and-covering belly pan is glued to the underside of the lower wing and is nicely faired into the fuselage-to-wing joint. Many structural components are joined with 4-40 socket head capscrews and washers and preinstalled T-nuts. I found that many of the T-nuts had to be chased with a 4-40 tap, as they were very tight. This is a small thing, but it's easier to do before you start the assembly. When I assembled the wing struts, I found that a few of the holes were drilled just far enough "off" to prevent the capscrews from lining up perfectly with the T-nut. I redrilled the holes and quickly fixed this. One problem I had with the hardware was that most of the supplied 4-40 capscrews are too long. I replaced some of them with shorter ones from my own supply. The manual doesn't specify hardware lengths, so it is up to you to choose a suitable length and where to use washers and locking washers. RC Guys supplies more capscrews than are needed—a refreshing change.

The other hardware is of excellent quality: Sullivan 4-40 links, a push-pull cable control for the rudder and aluminum landing gear with proper axles and wheel collars. You have to drill the fiberglass wheel pants and install T-nuts before you put them on. I used a small sanding drum on my Dremel tool to enlarge the wheel cutouts slightly to allow the wheels to rotate freely.

A U-shaped joiner wire with a welded control arm is supplied for the elevators, and the elevators are drilled for this joiner and hinge-point-style hinges. I noticed that the welded area had abraded the wire slightly. I wasn't too concerned, and I assembled the elevators and glued in the hinges. Then I noticed that the elevator halves were slightly misaligned. I tried to bend the

SPECS

PLANE: 33% scale Pitts S1

MANUFACTURER & DISTRIBUTOR: RC Guys

TYPE: Giant, sport-scale aerobatic biplane

FOR: Intermediate and up

WINGSPANS (top/bottom): 683/8/65 3/4 in.

WING AREA: 1,610 sq. in.

WEIGHT: 14 lb. (12 to 14 lb. advertised)

WING LOADING: 20 oz./sq. ft.

LENGTH: 64 in.

RADIO: 4-channel required; flown with a JR PCM 10X transmitter; 4 Hitec 645MG servos (ailerons, rudder, elevator), 1 Hitec 425 throttle servo, 2 4.8V 1100mAh NiMH battery packs for radio system and engine ignition

ENGINE: recommended 1.80 to 2.20 4-stroke or 1.20 to 1.60 2-stroke glow 25cc to 50cc gasoline engine; flown with an RC Guys 48cc gasoline twin

PROPELLER & SPINNER: Zinger 22x8 wooden propeller, Dave Brown 4.5-in. aluminum spinner

TOP RPM: 7,500

FUEL: Gasoline (regular) mixed 40:1 (25:1 for break-in) with 2-stroke oil

ONBOARD BATTERY: 1 1100mAh NiMH 4.8V pack

PRICE: $399

COMPONENTS NEEDED TO COMPLETE: Radio components, engine, fuel tank, spinner

SUMMARY

The 33% scale Pitts S1 from RC Guys is a sweetheart of a model. It's sure to satisfy scale fliers, sport aerobatic pilots and Sunday fliers because it's well built and looks great. Flight characteristics are typical of a Pitts Special—a whole lot of fun! It flies the traditional aerobatic sequences well. It has a good nature when airborne, isn't at all difficult to fly and does most maneuvers with grace at a moderate speed. Because of its excellent slow-flight characteristics, this IMAA-legal giant-scale model is easy to see in the air, so it's suitable even for smaller fields. Its price is reasonable, it has good-quality covering and hardware, and it's an easy build, so it should appeal to nearly everyone!

AIRBORNE

Now for the fun part—flying! It's easy to assemble the 1/3 Pitts at the field. Two bolts secure the lower wing to the fuselage. Now mount the struts. Finally, attach the upper wing to the cabane with two more bolts. I had set the radio up so that my triple rates gave me the recommended high and low throws.

I filled the 24-ounce Du-Bro tank with fresh gasoline mixed at a 25:1 ratio with Penzoil 2-stroke oil—the recommended break-in ratio for the twin. I turned the radio on, and with a helper holding the model, I started the engine. The twin had with a Zinger 22x8 prop that gave a maximum rpm of 6,600 (while still set on the rich side) and a rock-steady idle of 1,700rpm. Taxiing the model is quite easy, and with the short-coupled tail and more than adequate steering, ground handling is quick. You may want to go to low rate on the rudder for takeoffs to avoid over-steering until you get used to it.

I advanced the throttle, the tail quickly left the ground, and after a short roll-out, the model lifted off gracefully. I spent the first few flights trimming the Pitts and trying basic looping and rolling maneuvers. As I put more and more flights on the Pitts, I have pushed the flight envelope with more maneuvers such as inside and outside snaps. The outside snaps are slow to start, but inside snaps are excellent. They are very recognizable, but even on high rate, they are not too fast. Stopping the rotation accurately is not difficult. The model enters spins easily, and exiting a spin takes about half a rotation, so you have to anticipate your target heading a little.

For a while, the 48cc twin gained power with every flight. Climbing out is effortless but not especially fast. The Pitts is very smooth and graceful in the air, and it doesn't seem to do anything too fast. This is not a high-performance monoplane; it's a classic Pitts Special with the drag of a stubby biplane. What it does it does very well. It is a little tricky to track through loops without wandering off heading, but again, with its short tail moment, it does require more flying skill to look good with this type of plane than, say, an Extra or an Edge.

Slow-flight characteristics are amazing! The model handles very well as it slows down. At just above idle, it settles into a slowly descending glide path, and landing is easy once you get a few under your belt. Don't cut power too much until you are on the ground, or it will descend quite rapidly. This biplane has a lot of frontal area and drag.

This Pitts begs to be flown. Just sitting on the runway it looks great, but once in the air, it is awesome to watch and to fly it. The controls are quite effective, but even on high rates, they are not too responsive. The response seems just right.

The RC Guys 48cc twin really runs smoothly, and it's a perfect powerplant for this model. I really enjoy this airframe/engine combination.

U-shaped joiner wire, but it snapped in half where it was welded. I used carbon-fiber rod to join the elevator halves and also used the welded control arm and the supplied carbon-fiber pushrod. This all worked out fine in the end, but I suggest that silver brazing the arm to the joiner wire would be a better system, as when a joint is being brazed, material is deposited around it and makes it stronger.

When the elevators are on and the rudder is hinged, it is quite easy to install the rudder linkage and tailwheel steering assembly. Instead of cutting another set of holes, I ran my push-pull cables through the round access holes. With the cables going to the rudder arm crossing over one another, the existing holes were in the perfect location, and that's two less holes in the fuselage.

The firewall needs only to be glued into place and reinforced with the supplied triangular stock. There are also a few other minor odds and ends such as the mounting bolts and the throttle-cable run that will be chosen to suit your engine.

POWERPLANT

I installed a beautiful little RC Guys 48cc gasoline twin that fits the Pitts cowl perfectly without any cutting, except to clear the exhaust stacks. The engine is very smooth, and I was sure it could provide excellent power for the Pitts, as it is right at the upper end of the recommended engine range. I will present a full review of this engine in a future issue of *Fly RC*.

Installing the engine was easy. I simply used a set of aluminum stand-offs that brought the prop hub out about 1/4 inch past the front of the cowl. I mounted the ignition unit and its battery up front to avoid having radio interference. With this configuration, the Pitts balanced right on the recommended

The RC Guys 48cc twin is a perfect match for this model, and provides abundant power for realistic performance.

There is plenty of room in this fuselage for any radio gear. I used Hitec's adjustable output arm to fine tune the throttle linkage throw. The fuel tank is very close to the balance point, maintaining predictable handling throughout the flight.

Above left: The lower ailerons drive the upper ailerons with scale "slave" struts. Right: Lightweight pull-pull cables control the rudder. The scale tailwheel bracket has steering springs to protect the rudder servo from ground handling shocks.

forward CG without needing additional weight. A lighter engine would probably require nose weight for balance, so going with the larger engine was a great plan.

TIPS FOR SUCCESS

Although the manual is fairly clear as far as it goes, but you'll have to figure out some aspects of the assembly for yourself. If you have any kit-building experience or have assembled a few ARFs, I think you will be just fine.

The items I had a problem with: some incorrect bolt lengths, T-nuts that I had to retap and wheel-pant openings that I had to enlarge—all easy to fix. Do take care with the elevator joiner wire, and if you have to bend it a little, watch the welded area for weakness.

Other than that, following the instructions will set you along the right path toward having a great flying model.

FINAL CALL

I really doubt that any modeler would be disappointed with this model's build quality or flight characteristics. The RC Guys 1/3-scale Pitts S1 is a great model that's well worth the price. Anyone with intermediate flying skills or better will be fine flying it because it doesn't have any bad habits and is quite a sweetheart to handle. To transport and store it, it breaks down into manageable components.

If you've been itching to try a large aerobatic biplane, you will definitely enjoy this big Pitts. It doesn't matter whether your "thing" is scale models, aerobatics, or just having a great time flying. This one guarantees fun!

Links

Dave Brown Products, www.dbproducts.com (513) 738-1576

Du-Bro, www.dubro.com (800) 848-9411

Hitec RCD USA Inc., www.hitecrcd.com (858) 748-6948

JR, distributed exclusively by Horizon Hobby Distributors, www.jrradios.com (877) 504-0233

RC Guys, www.rcguys.com (519) 756-1110

Zinger Propellers, www.zingerpropeller.com (310) 539-2313

For more information, please see our source guide on page ___.