Pilatus PC-9

Not another PC-9! Seagull's smaller sport version is justifiably popular so it's no surprise to see this larger, closer-to-scale offering.

THERE'S EVERY REASON TO BE CHEERFUL WITH SEAGULL'S THIRD VERSION OF THE SWISS TRAINER - DAVID ASHBY TAKES IT FLYING

Makes a nice change from a warbird, don't you think?

I think we've got the message now... the folk at Seagull like Pilatus aircraft, and the PC-9 in particular. This, their third version of the tandem-seat turboprop trainer, spans 63" (1600mm) and slots between their very popular sport scale 60" span model and 70" span, 1.20 size machine.

In every respect it's a typical Seagull affair, displaying the company's usual design and manufacturing traits, which is no bad thing as construction, finish and supplied hardware are all to the fine standards we've come to expect.

Keep an eye out for this when you're next in your local model shop and ask to take a look inside - you'll be impressed.

Like its larger sibling, this model adopts a close scale outline yet is designed for a 75 - 91 two-stroke or 91 - 120 four-stroke. Moreover, the inclusion of an electric conversion kit means that all power options can be considered. In respect of the latter, a large top hatch

reveals a truly cavernous interior while a platform that's designed to support the fuel tank extends back to accommodate large battery packs.

The turboprop nature of the full-size translates - much like Seagull's recent PC-6 - to a slim nose and closely-cowled powerplant. As a result a nice electric motor seemed the best option, thus avoiding cowl extrusions and providing a sound more in keeping with the real thing. Where servos are concerned the model is created for standard-size units, my choice being Spektrum DS821 sport digitals for all but the retracts - more on this in a moment.

MANUAL LABOUR

Seagull could do everyone a favour and allocate a little more time to the instruction blurb, to be honest. The booklet is a series of step-by-step pictures with some text thrown in for

good measure; this format is just about acceptable for its smaller, simpler models, but those embarking on a larger, more complex project like this need a bit more reassurance than what's provided here. For instance the PC-9 is supplied with retractable tricycle u/c units and you'd assume (quite reasonably) that two retract servos are required: one to drive the pair in the wing and one in the fuselage for the nose leg... Right? Wrong. Sure, one is required in the wing, however the nose leg mechanism doesn't require the 180° of travel that a dedicated retract servo delivers (remember that the end points on a retract servo can't be adjusted). A standard servo isn't really going to be powerful enough, so a higher torque unit is required - a Futaba digital in my case. While we're on the subject, a fuzzy photo in the manual provides a hint of there being a big output disk fitted to the servo, but a good manual shouldn't leave builders guessing.

Moving along, the servo tray doesn't resemble the layout in the manual so you may need to be creative with your radio placement, depending on your chosen power source. And one more thing: a parts list would be useful, as a number of the supplied screws don't match the sizes specified. As it was I managed to find alternatives in the hardware bag without resorting to my spares box, so got there in the end.

SCREW FIX

It's not all bad, far from it. No-one does the woody bits better than Seagull, with the quality of the laser cutting, covering and fit of parts being trully excellent.

The general construction process is effortless, indeed since this is a regular ARTF it's the small details such as the power system fit and retract installation that require the most attention.

In terms of detail, the pilot figures look good and their colourful helmets are a nice touch. They're heavy, though, so use epoxy to secure both these and the cockpit fittings before adding the canopy (using canopy glue); white trim tape finishes the job nicely.

Now, I'm not a great fan of adding ABS vac-form mouldings to a model, especially where:

a.) They require cutting to shape.
b.) The coat of paint that's applied cracks and falls off.
c.) There's just a thin edge with which to adhere the part.

Small details such as the fin T-piece and mock exhausts are nice touches.

Set a slightly forward C of G for the first flight and adjust from there.

Well, you guessed it, the PC-9's ABS bits are all of the above. As a result, adding them in a convincing fashion is difficult to the extent that I'd suggest you don't bother. There are only two anyway and they'll simply end up looking like the afterthought that they are.

POWER PLANTING

An E-flite Power 60 motor seemed the ideal choice at the front. Tried, tested, robust and rated for up to 1200W, this motor is ideally suited for 9 - 10 lb (4.1 - 4.5kg) models when allied to a 14 - 15" prop and a 6s Li-Po.

Whatever motor you use, it's important to remember that the tricycle u/c will determine the maximum prop size. Realistically this means you're looking at an airscrew no bigger than 15".

It's suggested that the motor mount extension be epoxied to the firewall and while bolts and captive nuts are more traditional, the former tends to be Seagull's way of doing things. Still, it works so just roughen the surfaces before adhesion and you'll be fine.

The ESC's location isn't made clear, although the underside of the motor extension seems an obvious place for it. Open out the cowl vent (under the spinner) and the ESC will benefit from a good supply of cool air. Also, make sure to cut an air flow exit hole on the cowl underside. Driving a 15 x 10" prop, my system records 800W and 36A peak, so I've used a 60A ESC. Incidentally, power for my Rx and servos is from a LiFe 1300mAh battery, distributed via a PowerBox Digiswitch regulator.

UPS AND DOWNS

The supplied mechanical, metal-frame retract units are generally strong. I don't think I've ever seen such thick wire used as that fitted to the main legs and installing these (in the wing) is pretty straightforward. As a bonus, the separate wing centre-section means they're easy to work on, too. Don't bother fitting the ABS plastic wheel bay liners, though. The fact of the matter is that liners are designed to hide the mechanical

This PC-9 is like every other Seagull model you'll find - very strong and very well made.

That's the rudder servo sat on its lonesome, the elevator servo lives closer to the control surface.

The pilot chappies aren't too bad at all, they're solid mouldings though so make sure they're secure.

The spinner supplied isn't well balanced so I fitted one of the Irvine metal backplate examples.

bits, but these don't. If you're keen to proceed then you'll need to run the retract servo pushrods through the liner side and into the wheel bay, although so much surgery is required to achieve this that I suspect, like me, you'll eventually give up. My advice is to paint the wheel bay interior - it'll look just as good, whilst leaving access to the mechanics.

The nose leg isn't quite so straightforward. Trial fitting will make it obvious that the unit must be installed with a little offset so the cavity in the mount can accommodate the pushrod's movement. A thick wire is supplied to operate the unit from a servo in the radio bay, and hooking up to the (previously mentioned) high-torque servo should be straightforward. I fitted the clevis 1" (25mm) out from the servo arm centre

The small, rear, underside hatch that's designed for the receiver battery.

Top marks for the metal clevises and quality hardware.

and adjusted the end points at the Tx to achieve smooth operation.

A steering servo is also required, this sat alongside the retract servo and connected using a long wire. Three issues were apparent here:

1. The servo arm wire stops at the leg with a metal clevis but the clevis pin is much thinner than its receptacle, which encourages slop.
2. The wire from the servo needs supporting, to prevent slop and reduce the danger of the nose leg wheel digging in and blowing back.
3. There's too much movement in the nose leg steering mechanism, which is promoted by a gap between the sliding steering horn and the metal pin over which it slips up and down (so rudder movement doesn't also move the wheel when it's retracted). I'm not sure there's much that can be done here, though.

Remedies? Well, I used the redundant i.c. throttle snake outer sleeve to support the steering wire from the servo, which helps prevent blow back. Moreover, I sleeved the clevis pin with a tiny piece of thin tubing to reduce movement within the mechanism.

Activating the retracts using a single (channel) switch will likely mean using a Y-lead and reversing one of the servos. Here, then, I used a very neat little Y-lead reverser unit from Logic-RC.

BATTERIES AND C OF G

The PC-9's long nose means that batteries don't need to be placed as far forward as you'd expect. Seagull have recognised this by providing a sliding battery holder that slips behind where the i.c. fuel tank would rest, and just in front of the wing's l.e. The pack can't go back far enough though, and so, to help balance things up, a hatch is provided at the tail end for the Rx battery.

Now, the manual states that the C of G is 2.75" (70mm) from the l.e., measured at the tip. By my reckoning this places the balance point about 0.4" (10mm) behind the main spar. My 6s 3600 - 3800mAh Li-Pos weigh between 23 - 35oz (652 - 992g) and pitched the model on its nose until they were moved further back to overhang the radio bay. This prompted me to make a ply box end to the tray to hold back half of the battery, while using Velcro straps to stop the pack from moving about.

Having said all of this, and with the benefit of having flown the model, I can confidently state that the C of G should come forward from the recommended point by a good 0.4" or 10mm. The best advice therefore is to fly the model a little nose heavy, which is easily achieved by shifting the battery forward. In hindsight, my battery tray extension wasn't needed, and the recommended C of G must be taken as the absolute maximum safe rearward location. Needless to say, the obvious solution of moving the Rx battery further forward, adds too much at the front.

UP AND AWAY

The first few flights were spent establishing a satisfactory C of G location. With the recommended point being too far back the model flies much like it's balanced on a ball. It isn't unflyable like this but it's decidedly uncomfortable with a snappier stall response and a sluggish roll rate. Adjustments made,

the model is nicer and flies exactly as you'd expect. Of course, the great thing about tricycle u/c models is that you don't have to balance elevator and throttle to hold the tail down, so full power can be applied from the off. Some trike machines seem to take an age to unstick and sometimes need a shove of elevator to do so, however the PC-9 rises with just a small squeeze of the stick.

In terms of power I think it's fair to say that my 80W/lb set-up is adequate to haul the model around convincingly (see the video) but insufficient to punch holes in the sky. It's a power system that makes you think about inertia and momentum, and how best to carry these traits from one manoeuvre to the next. I fly with $^1/_2$ to $^3/_4$ throttle most of the time, yet my 3800mAh packs are still sufficient to deliver comfortable 8-minute flight times. (Note that some of the newer generation cells offer higher capacities with no weight gain compared to the older 6s packs I have at my disposal).

The PC-9 looks great in the air and flies with a satisfying smoothness. The roll rate improves as the C of G comes forward whilst the stall response improves dramatically, to a point where smooth, slow flight won't trouble the pilot.

I think the trick with this model is to keep things smooth. Partly because this looks right - the full-size PC-9 is a jet trainer, so flying the model like a small jet seems appropriate - and also because the model can dump speed pretty quickly in a sharp turn. Keeping the repertoire big and smooth is the order of the day.

Landing is just a case of giving yourself plenty of time in the downwind leg and approach, whilst balancing throttle and elevator. The model's not going to bite if a sensible speed is maintained although it would benefit from some flaps to help it home. The main undercarriage

Nicely concealed, the top hatch (for battery access) is retained by strong magnets.

The retract units for the main legs are good, solid, mechanical items.

is robust enough but its narrow track means it's important to keep the model tracking straight after touch down as the slop prone nose leg needs little encouragement to twist and dig the wheel in, which sometimes makes for a messy looking procedure.

ALL SAID AND DONE

I've had a lot to say about the model but make no mistake, I like it a lot. It's an aeroplane that's refreshingly different and one that flies well with bags of flightline and aerial presence. It also makes a refreshing alternative to a warbird.

It's one of those bigger projects, though, and certainly not a first low-winger. Rather, it's for the more experienced pilot who can make sure the model is built carefully whilst keeping that C of G a little in front of the suggested point for the first few outings. My power system delivers the minimum most flyers would find acceptable, although the model doesn't feel underpowered with 800W on tap.

One disappointment must centre around the integrity of the steerable nose leg unit which, despite my tweaking, can still be prone to digging in, indeed, I'm toying with the idea of replacing it with one of E-flite's new electric units.

Anyway, all told, Seagull's 1.6m PC-9 comes recommended - it's a lot of aeroplane for the money and I'm sure you'll like it.

Catch our PC-9 video at modelflying.co.uk

DATAFILE

Name:	PC-9
Model type:	ARTF scale
Manufactured by:	Seagull Models
UK distributor:	J. Perkins Distribution Tel. 01622 854300 www.jperkinsdistribution.co.uk
RRP:	£199.99
Wingspan:	63" (1600mm)
Fuselage length:	58.3" (1480mm)
Wing area:	4.5sq. ft. (0.4sq. m)
All-up weight:	10 lb (4.5kg)
Wing loading:	35.5oz / sq. ft. (10.8kg / sq. m)
Functions (servos):	Aileron (2); elevator (1); rudder (1); retracts (2); steering (1); throttle (via ESC)
Rec'd engine:	75 - 91 two-stroke, 90 - 120 four-stroke or electric equivalent
Power system:	Power 60 outrunner, 60A ESC, 15 x 10" prop, 6s 3800mAh Li-Po
Quality:	Poor | Acceptable | Excellent
Assembly:	Easy | Intermediate | Difficult
Flying:	Novice | Improver | Experienced