Krys Holubecki's Hangar 9 Piper Pawnee 40, weighs about 8.5 lb with a Saito 82 (!). That's an awful lot of engine for such a light model, but Krys says it's lovely to fly. Certainly looks good [Andy B photo].

Parish Notices and Reports

WLMAC BBQ, Wednesday 12th September

The club BBQ on Wednesday 12th September turned out to be on one of those unexpected, almost windless evenings with a touch of cloudy sunlight that we sometimes get in late summer; it was a great afternoon/evening, and it was truly a pleasure to be flying something.

The BBQ (ably manned by Roy Lanning) wasn't bad either, apparently the burgers – which were really excellent - were sourced from Costco, of all places.

Reminder – WLMAC Aviation Quiz Club Night, Thursday 11th October

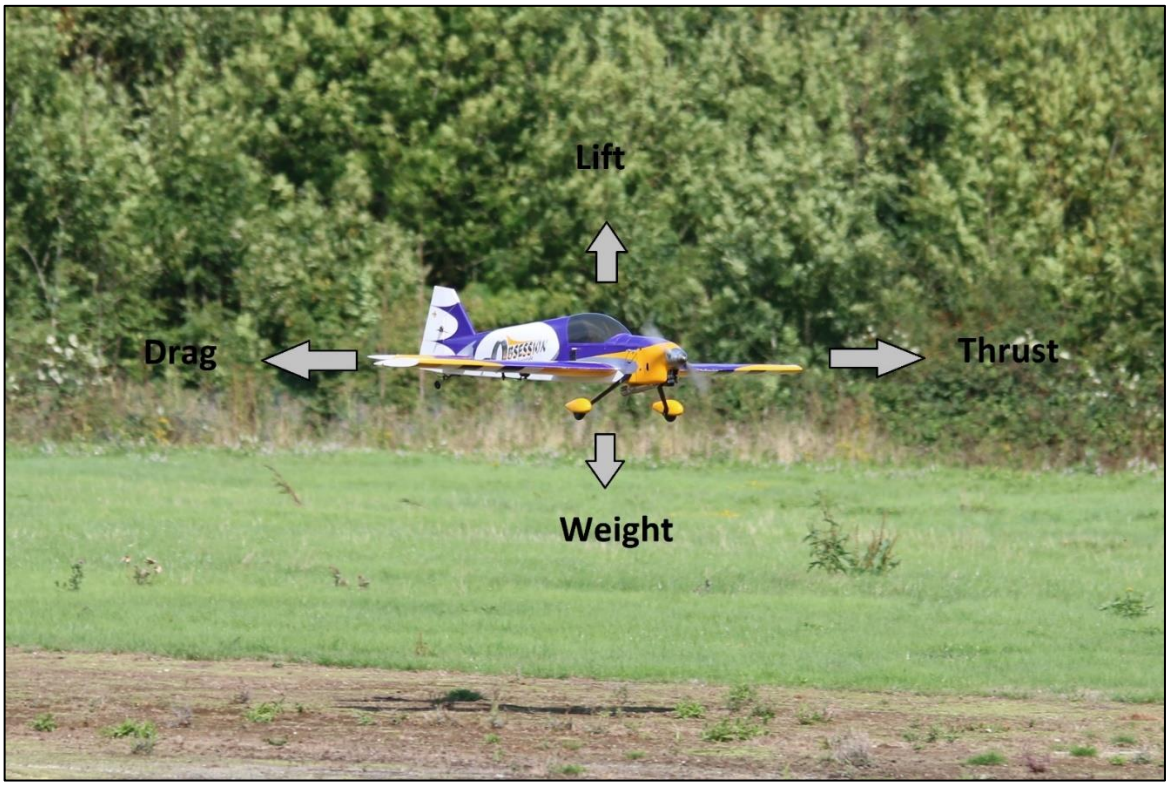
Just another reminder that we're going to have an "Aviation Quiz" for the October club night at Uxbridge Golf Club on Thursday 11th October; please do come along and have a go because Stuart and I don't want to be sitting there on our own!

A Few Words on Landings – Andy Blackburn

I don't think that many people would disagree with the statement that there's a trick to landings; some might wonder what all the fuss is about, of course, and it's exactly that sort of disgustingly talented individual who is showing the rest of us up!

So, I thought a little bit of explanation of how to do it and what's happening to the model during the process wouldn't go amiss. I'm going to assume for the sake of simplicity that you have a trimmed model that will do a three-point landing; most models will, but if you have a particularly large and heavy warbird then you might find that you have to wheel it in – I'm not going to cover this because it'll complicate matters, but drop me a line if you want to know how it's done.

OK, So What Actually Happens When the Model Touches Down?

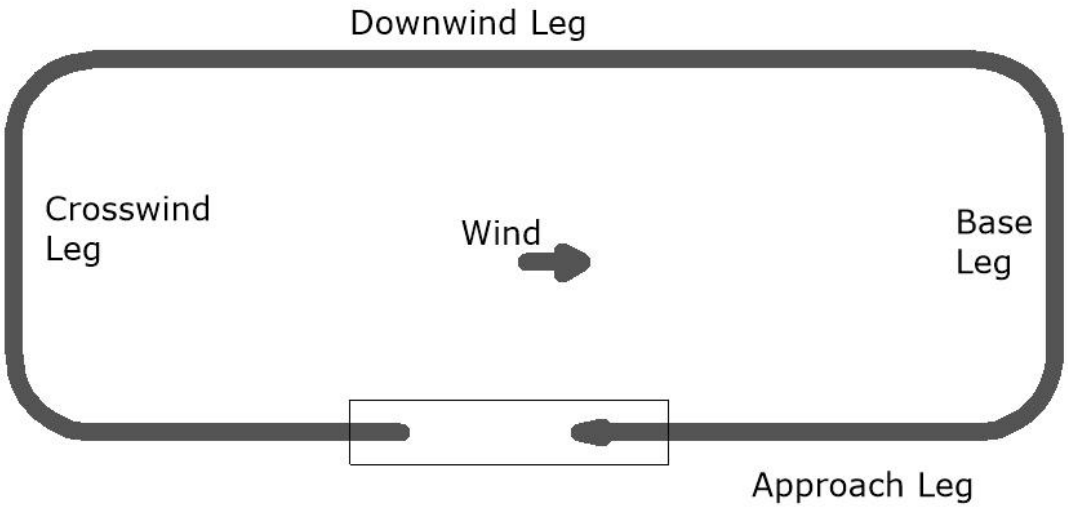


This is a model flying straight and level at low speed; there's a tiny bit of power on, and all the forces of thrust, drag, weight and lift are in balance. All we have to do to make it land is to slightly reduce the lift so that it sinks gently onto the runway; the correct (and best) way to encourage the model to land is to reduce the power so that the thrust drops off, which allows

the drag to reduce the speed so that the amount of lift produced by the wing reduces, which allows the model to sink gently and gracefully onto the runway.

Contrary to what some people seem to think, landings are **not** accomplished by leaning forwards on the stick and forcing the model onto the runway!! If you try to force it onto the deck before it's ready you'll get a bent or collapsed nose leg, and it might well bounce back into the air again because it's still got flying speed, so it still wants to fly; the key to understanding landings is to realise that the model will land when it's ready – when it's run out of flying speed – and not before!

The Landing Circuit



Many years ago, the idea of the "landing circuit" (or "traffic pattern") was proposed for full-size aeroplanes; basically, it's a procedure that's used to position the aeroplane for landing and minimise the risk of collision with other aircraft; it's so useful that we use it for models today. A circuit (let's assume a right-hand circuit, landing from the right) has the following components:

- An into-wind leg that's normally used to put the landing gear down and visually check that all the legs are extended. Turn right onto:
- The Crosswind leg upwind of the runway, heading away from the pilots box. Turn right onto:
- The Downwind leg, parallel to the runway but in the opposite direction; it's often best to start managing the speed on this leg (if you're really fast, maybe even go to idle for a few seconds to allow some of the excess speed to bleed off) and start lowering the flaps if you have them. Turn right onto:
- The Base leg; lower the flaps all the way and set the throttle, I normally find it needs to be all the way back to idle with a clean sport model that has no flaps, and about 5 notches

with a fully-flapped warbird; what you're trying to avoid here is an embarrassing stall as you turn onto finals or even part-way down the approach as you come down through the wind gradient. (See below for a description of the wind gradient. Sorry, what? There's no ratchet on your throttle stick? Please consider having that fixed because a throttle ratchet makes life *so* much easier). Turn right onto:

- The Approach or Final leg ("Finals"); it's very important at this point that you **establish a rate of descent** by pointing the model somewhere downwind of the runway threshold (that is, the down-wind end of the runway), so that you can see a bit of the top of the wing – if you don't do this, you're obviously going to miss the runway which, considering the size of the target (the entire Earth), can often be a bit embarrassing.

All you have to do at that point is imagine a set of rails in the sky and let the model fly down the approach leg towards the runway threshold, watching the speed and adjusting it as necessary (which is rare if the wind is reasonable and you've set the throttle correctly on the base leg) and when the model gets low enough, ease back *ever so gently and slowly* on the elevator – it's a tiny movement – to bring the nose up so that the model is flying level a foot or two above the runway, and in front of the runway threshold.

The model should then look something like the picture above, flying more-or-less level just above the runway.

(If you've got to this point successfully, you've got it made. If you haven't (for whatever reason, doesn't matter what it is), roll on the power to establish a positive climb and get back into the circuit to have another go. If you are in any doubt, do it now because although you can do it later, it doesn't always happen without damage; you need to be lucky, in other words…)

Here's the Trick

The trick is that you then throttle right back to idle and focus on letting the model fly level at the same altitude – just concentrate on flying down the runway at the same altitude, *watch the fuselage to make sure it's flying level*, don't rush it, don't try and force it onto the ground, don't

look at anything other than the fuselage, don't think about anything other than watching the fuselage and keeping it flying level, just fly at the same altitude. And watch the fuselage.

Whilst you're doing this, the model will be slowing down because the throttle is at idle and when it's no longer flying fast enough to maintain altitude, it'll start to sink, just a little bit.

(If it doesn't start to sink at some point, you were way too fast! Roll on the throttle, climb back to circuit height and have another go.)

When the model starts to sink, ease back on the elevator to try and maintain the original altitude, this is often called the landing flare but again, it's a tiny movement. If you do it properly, the nose will come up and it'll land itself on the mainwheels.

Let it run straight, turn off the runway in case there's someone behind you and taxi back. Job done, applause from the gallery.

So What Usually Goes Wrong?

There are several ways in which the landing can go wrong;

1. Too fast on the approach – it's very easy to fail to manage your speed correctly, particularly if there's not much wind, either by (usually) having too much speed on the downwind leg or having too high a throttle setting on finals so that the model doesn't lose enough speed as it descends towards the runway threshold – this is often a problem with

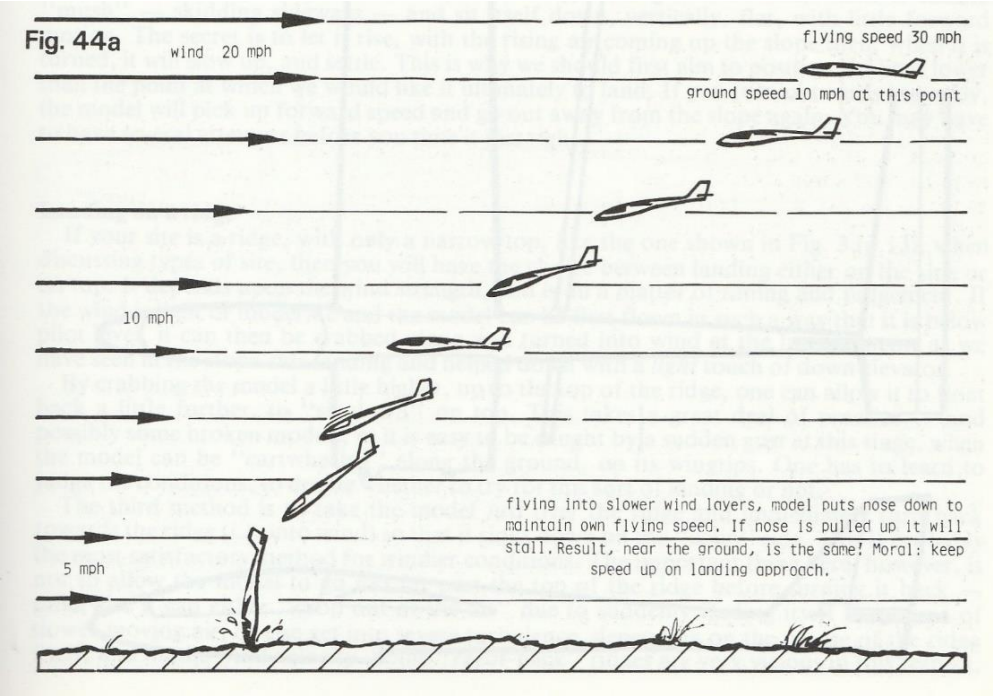
two-strokes that have an idle speed set too high. In either case, it's best to abort the landing and have another go, but try slowing down sooner or using a lower throttle setting. You might find that you have to go straight to idle as you turn onto the base leg, or even part-way down the downwind leg.

2. Too slow on the approach – low-inertia models (e.g. most foamies) will often need a steeper approach and a bit more power on, simply because they bleed speed off so quickly if you don't try to keep them moving.
3. Watching the gap between the wheels and the runway – this is perfectly natural but it's a **Very Bad Thing** because if you're watching the wheels, you're not watching the fuselage; and if you're not watching the fuselage, you don't know where the model is pointing, so you don't know where it's going next. It's very important to **watch the fuselage** – say it repeatedly under your breath if you have to, as a kind of amateur Cognitive Behavioural Therapy, but if you watch the fuselage, all will be well.
4. Failing to aim the model at the runway – again, it's very easy to do the same thing that you did last time and just go into the circuit, then you realise that something's wrong, work out what it is, point the nose down but you've then used some of the time and space that you've given yourself on the approach, and things are often then a bit tight and hurried. So, on the final turn, point the model downwards by leaning forward on the stick *momentarily* so that you can see a bit of the top of the wing, like this (exaggerated slightly for effect).

5. Too much elevator movement – the elevator movement to level out, which is a tiny, delicate movement that simply converts the model from a slight dive to level flight, is only a small, smooth movement of the elevator stick; if you have anything more than just enough elevator to make the model *just* stall at full deflection, landing can often be very difficult as you'll over-control, and one of the indicators of this is a slightly porpoiseing flight path.

The Wind Gradient

The reason that we need an excess of speed on finals is that if there's any wind at all (and there usually is, let's face it) then the wind speed at circuit height will be more than that just above the runway, and there will probably be some turbulence on the approach; the following diagram taken from a classic slope-soaring book illustrates what can happen.



A classic diagram from "Slope Soaring" by Dave Hughes

So, obviously, if you fly the approach at just above stall speed, you're not going to make it all the way down to the runway threshold without stalling – so we need a an extra margin of speed to get down to the runway safely. And we need a little more speed when it's windy.

Do You Need Flaps?

Well, that depends on the wing loading, how lifty (cambered) the wing section is, and how aerodynamically clean the aircraft is – flaps add drag as well as lift.

In very general terms, if you have something like an AcroWot (a clean airframe with fixed undercarriage and a thick, symmetrical wing section) that has a wing loading of maybe 22 oz/sq ft then flaps really aren't required. However, as you get just a little bit heavier than this with a thinner wing and maybe retracts, the model will fly noticeably faster and will gain speed quicker, so flaps will help a lot when you're trying to remove all that speed.

As a general rule of thumb (personal opinion coming up, your mileage may vary) I'd consider flaps to be extremely useful on anything that looks like it might be above about 24-28 oz/sq ft, or less than that if it's a small or particularly streamlined model.

However, I should perhaps declare that I like flaps; they make life so much easier if you have a particularly heavy warbird, and a fully-flapped landing with a scale model as it sinks gently onto its oleos can truly be a thing of beauty!

Events

Date	Event	Location	Description
Thursday, 11 October	Club Meeting	Uxbridge Golf Club	Aviation quiz **with cash prizes**!
Thursday, 8 November	Club Meeting	Uxbridge Golf Club	Skills Evening
Thursday, 13 December	AGM	Uxbridge Golf Club	AGM