



Look here, young fellow

Myopia or hyperopia? Or whether you should raise the gaze or chance a glance when landing. **Anthony Preston** shares his thoughts

THE other day I heard a student refer to advice he'd received from an instructor to "raise the gaze" in explanation for where he should look when judging roundout, flare and touchdown.

It made me ponder. Was it good advice for the microlight pilot?

Raise the gaze or chance the glance? First concern was the choice of "gaze". Gaze suggests hypnosis, whereas the eyes should be hard at work scanning the view ahead.

"Glance", if anything, with changing focus and peripheral scan, suits the situation better.

Unless you're flying a pusher, like the Shadow, the raised nose will obscure the runway ahead, forcing you to look to the left of the engine cowling and screwing up any chances of assessing vanishing points as guides to perspective.

There is much to be said for the perspective assessment, only possible through hyperopic vision, since we know the brain can better memorise the simplicity of angles, like storing a photographic image, than the rapidly changing myriad of detail when we look closer. Night flying at Charles Prince makes the case later in this article.

However, the very fact that the brain can retain triangular form with such precision permits a desirable release of attention to the more intimate: the nearer at hand.

I wasn't sure about this until I remembered how ab initio students in the Ikarus C42 invariably tend to drift left of the run-

way centreline, leading me to ponder asymmetry in a side-by-side cockpit, to which tandem pushers are not subject.

Parallax error affects the pilot's judgment when landing, through being offset from the aircraft centreline.

As a result, I don't teach "raise the gaze", preferring to advise the opposite, falling back on something I've always feared: analysis of my own technique.

To begin with, I was obliged to monitor my own (by this time entirely instinctive) eye movement, for how could I teach if I didn't know what I did myself? I worried that the process of investigation would destroy the magic: that the instinct, which worked by virtue of conditioned reflex, would suffer from the intervention of reason! That's quite absurd, hinting, as it does, at some kind of superstition.

To follow the behaviour of my eyes, I found myself breaking down the smooth analogue sequence, from descent on the approach through roundout, to flare and touchdown, in the same way a student feels his way down early in Exercise 13.

Although breaking it down into small components (initially twitches on the control column, growing by steps, into positive movement as speed falls off) wasn't a good thing, it was preferable to embarrassing balloons and bounces.

But what did my eyes do? I could hardly believe them. During the last stages of descent, I was looking deep to impress alignment on my immediate memory to know where the runway centreline was when I could no longer see it, having reached double-decker cue for pitch input to reduce rate of descent.

Then my focus, broken into swift and varying glances, came closer because what I needed to know, now that alignment was being dealt with by delicate, sympathetic rudder and aileron co-ordination, was how high I was above the ground, best judged by close inspection.

Benefitting from closer inspection brings a sense of security, and security leads to a confidence denied the pilot who gazes far into the distance.

Sympathetic rudder and aileron coordination deserves further consideration. "Wings level" is an admonishment frequently heard from instructors at this stage.

Unless a student has exceptional peripheral vision, he will need to be rubber-necking to maintain wings level, checking wing tips to horizon and ball in the middle.

Immediate correction is essential – anticipating where possi-

ble – to minimise roll and yaw. Sudden gusts, shear, and rotor both vertical and horizontal will be doing their best to unbalance the aircraft. Swift control inputs are as crucial as swift eye movements.

Adverse aileron drag applies to control-surface movement, not to be confused with the conventional secondary effect of controls due to control-surface displacement. The distinction is sometimes overlooked. Adverse aileron drag is derivative, a function of speed and degree, and ceases to create havoc once deflection is completed. Therefore, application of rudder in sympathy with roll has to be appropriate: faster aileron deflection, greater rudder input in same direction.

Unwanted yaw should be eradicated by judicious footwork, keeping the longitudinal axis in line with, but not necessarily parallel to, the runway centreline and with the wings immaculately level. Anticipation is important, and comes with experience.

When applying yaw to straighten the crabbing aircraft in a crosswind touchdown, it's important to remind oneself again of adverse aileron drag. If ignored, the upwind wing will lift – exactly what you don't want.

In the circuit

Now let's consider the circuit. Traditionally, Cessnas and Pipers fly wider and higher, at 1000ft with a long, drawn out final, while microlights scuttle below at 700ft, lighter and tighter.

First, the decision when to close the throttle, Second, when to select flap, in stages. Third, when to turn in, and finally, sideslip. Given all these options, it's hard to see how a student might get it wrong.

It's on base leg we consider another control, about which there is divergence of opinion between microlight and Cessna instructors: keeping in trim.

The C42 is blessed with fingertip trim control; not exactly Hotas, but a modest parallel: the head of the control column has trim control buttons for nose up and nose down.

An LED position indicator in the instrument panel has one important purpose, to enable the pilot to set the trim to neutral for takeoff, but can otherwise be largely ignored.

In flight, trim is set by feel, not the gauge. Instinctively, the forward button for nose down should be pressed until no further physical pressure is required to maintain correct attitude in flight – not dabbed at, which encourages pilot-induced oscillation.

Although the C42, with its polite behaviour, departs only slightly from cruise trim when throttled back for glide approach, some nose up is comforting.

Personally, I like a bit of back pressure, so long as it's always the same, but the pilot needs to be aware that application of full power, in go-around or overshoot, will cause strong pitch up, requiring forward stick and right rudder! It's easily dealt with once experienced.

In climbing (Exercise Seven), you will find some instructors happy with PAT, or "power, attitude, trim", as an acronym, but PAHT fits the bill better. The H stands for "hold", and getting a grip on it is important.

Applying power, followed by attitude, will bring about a period of change in airspeed and aircraft trim, which is not immediate. Engine revs drop as the climb attitude is established. Without a delay and hold, trim control input will be counter-productive. It is not intended for use other than during stabilised or settled conditions.

For landing, using the trim indicator as a setting, irrespective of feel, simply complicates our approach. It's no accident that the LED indicator is found near the bottom of the instrument panel.



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Intelligent handling of trim dictates either a glide approach with power off all the way or, if under power, throttle back and retrimmed well before the threshold. Otherwise the pilot will experience change of feel when he doesn't want it.

Lights in the darkness

Incidentally, I have just put a student through a training programme to get his NPPL(M).

Nigel Allen held a PPL(A) licence in Rhodesia some 40 years ago, just before it became Zimbabwe. Back in the UK, he'd built an SSDR and wanted to obtain a valid licence.

The BMAA and CAA looked at his logbook and licences and decided, despite his not having flown in the interim, that his J3 Piper Cub hours entitled him to an abbreviated course.

Nigel and I had both flown the same Cubs at the same airfield. When I was teaching 10 years earlier it was called Mount Hampden. In Nigel's day it was Charles Prince.

It was night flying at Mount Hampden that reinforced the argument in favour of angles for perspective judgement. As I recall, the J3 had no instrument lighting, just a panel pathetically illuminated by tiny spotlamps. And no landing light.

The instructor hunched in the front seat, his body to one side so the student had a chance of seeing.

On the sunbleached grass of the main runway was placed a single row of paraffin lamps, carefully spaced.

The instructor of the day would take off while it was still light. The sun sets rapidly in the tropics, and as it disappeared over the horizon, he flew the crepuscular stages of oncoming night until it was pitch dark.

The only visible objects in the empty bundu were the distant light of the clubhouse and control tower and the row of flickering paraffin lamps.

He was teaching himself to interpret lamp spacing. There's nothing else he can use to judge distance and height.

Once he'd mastered it, the student joined him, flying dual until the instructor reckons he'd got it, and then it was time for the student to fly on his own, in Stygian darkness. ▶

Facing page C42 landing nicely at Carrickmore, Northern Ireland. With strips this narrow, you need to stay on the centreline

Above The Piper J-3 Cub



“ One feels that the art of flying has become more difficult, and I don't know why ”

▷ How was it the first time I did it? Shall I say – a little disconcerting?

At your disposal you have turn/bank indicator, directional gyro, artificial horizon, ASI and altimeter. And you have the row of lamps. You know you have to land to the right of them. All else is faith. I find myself drawing comfort from the glow of the wing-tip lights reflected from the silver fabric under the wings.

I turned left from base leg onto final, closed the throttle and descended, wings level and in line at 55kt, until my brain told me I was at a height to begin an initial reduction of sink.

You land the Cub on the mains and the tailwheel. Sitting in the rear, you couldn't see much in the three-point attitude, but wheelers were regarded as too tricky at night.

Stick brought back progressively until it reaches the stop, at the stall. And there you sit, rather quiet, engine gently clunking.

Are you two feet off the ground, or 20? Who's to say? Then, invariably, comes the rumbling of the wheels, all touching at the same time. Surprise and relief. It puts perspective into perspective, especially at night.

Oh, by the way, it's the nearest lamp you look at as you land. The others have done their job.

Free from fear

Raise the Gaze or Chance the Glance covers one of the anomalies of learning to fly, and it's probably more subjective than I acknowledge.

One feels that the art of flying has become more difficult, and I don't know why. Aircraft are far easier to control than they were in the early days, and you only have to remember how the ATA pilots of the Second World War flew everything from muscular fighter aircraft to huge four-engined bombers in challenging conditions, with minimal flying aids, yet achieved extraordinary safety records.

Fear of flying is usually caused by a combination of too much imagination and serious misconceptions.

Not much can be done with the first, but you can be rid of fear through exposure. An aeroplane won't fall out of the sky for no reason, and looking far ahead and ignoring the comfort of what lies close at hand can deny the budding aviator that freedom from anxiety that is the foundation of a true love of flying. □

Above An Ikarus C42 landing. Students tend to drift to the left, says Anthony

ETHANOL: the hidden menace

Michael Pollard on the tiger lurking in your tank just waiting to bite – and the only way to tame it

OK FOLKS, time to sit up and take notice of the possible tiger in your tank. And it's not the Esso kind.

Some time ago, I wrote a letter to my MP Bill Esterson saying:

“I use machinery on which my life depends – namely a microlight aircraft. Up until today, I was happy to fuel my engine with 95 octane petrol, until I realised that 95 octane fuel contains at least 5%, and often 10%, ethanol.

“Now I realise that ethanol has to be added due to an EU directive to lessen environmental impact. However, there are negative effects that negate any supposed advantage in that ethanol destroys engines and therein creates more pollution in the energy required to replace them.

“Also, I rather like the sound of my engine, and looking round for an emergency landing field in silence is not part of my flight plan.

“Therefore I would ask you to consider raising this as an issue of some importance. It should be mandatory that fuel pumps are clearly marked to indicate the ethanol content of the fuel they dispense (E0, E5, E10 etc).

“Information pertaining to the effects of ethanol should be made freely available via a website. This will have a practically negligible cost to the taxpayer. Most importantly, fuel companies are given the ability to continue to supply an amount of E0 fuel for the foreseeable future.

“When I first bought my aircraft it was very new, with only 2h airtime, but had not been run for a long time. However, I couldn't get it to run for more than a minute. It only became clear just what the problem was when I researched the web.

“The rubber fuel line had corroded and the snap connector was blocked, as were the filter and fuel pump. The ethanol had absorbed water from the atmosphere and a jelly-like substance had blocked everything up.

“Had I managed a takeoff, the engine would have cut and I would have crashed. My engine is a four-stroke, but this is a more significant problem with two-strokes, as the ethanol attacks crankcase etc seals.”

Mr Esterson did reply, but nothing positive has happened since. Then I was spurred to revisit the subject when one of my fellow club members at Ince had an engine failure on his 912-engined machine, and on investigation found the fuel filter blocked.

As I'd said in the letter to Bill Esterson, my Bailey-engined Dragonfly had only done 2h, then stood unused for four years with fuel in the tank and open to the atmosphere via the