Introduction
Welcome to the first edition of the BMAA Training Newsletter. This quarterly publication is aimed at Microlight Instructors and will provide useful information and insights to the ups and downs of microlight training.

Why?
In recent years it has become increasingly difficult for the BMAA panel examiners to find time to dedicate to all aspects of training, so it was decided to put together a new training committee in order to address matters like; updating the training syllabus, reviewing and amending exam papers, disseminating important information, improving training standards and providing a means by which instructors can communicate and share ideas.

Meet the committee
The training committee comprises of a broad spectrum of instructors and examiners, selected from a large number of suitable volunteers.

From left to right:

Simon Jeffrey - Pegasus France – FI / FE
Sandie Reader - The Microlight School Lichfield Ltd - FI / FE
Angus Lacy-Hulbert (rear) – Clearprop! Microlight School Ltd – FI / FE
Deepak Mahajan - London Airsports – FI / FE
Sandra Reid (rear) - Fly South - FI / FE
Mike Edwards - The Flying Shack – FI / GR
Rob Grimwood (rear) (Chairman) - Exodus Airsports – FIE and Competition Pilot
Fiona Luckhurst (Vice Chairman) - Shadow Flight Centre – FIE
Geoff Weighell - BMAA Representative - FIE
Paul Dewhurst - Flylight Airsports Ltd - FIE and Competition Pilot
Dave Lord – Wanafly Airsports - FI / FE
Training News

NPPL revalidations

Biennial training flight. As many of you are aware the Microlight NPPL requires a 2 yearly revalidation as long as the pilot has:

- flown at least 12 hours which includes at least 8 hours as pilot in command;
- completed at least 12 take-offs and 12 landings;
- undertaken at least one hour of flying training with an instructor entitled to give instruction on aeroplanes of that class (with an entry into the pilot's logbook signed by the instructor);
- flown at least six hours in the 12 months preceding the specified date.

With that in mind what should be done during the instructional flight? A test is not necessary, but unless the pilot has a special request for example, an hour on PFLs or Short Field Landings, then it would be advantageous to carry out exercise 17c and work on any weak areas. Make sure the pilot is also aware of the requirement for the licence to be signed on the certificate of revalidation page by an examiner. Also this is an opportunity to discuss ambitions, any new rules and regulations that may be present and give guidance to the pilot to put them on track for a safe and successful flying season.

Knowledge Base FAQ Section

Many questions have been asked by instructors, new and old, regarding various regulations and training matters. We now have a 'Frequently Asked Questions / Knowledge Base' area on the BMAA site as a first stop location to provide general answers to such questions. For those who wish to remain anonymous then this option is included. This section will be improved and refined as more material comes our way. See http://faq.microlighttraining.co.uk for more details.

Hot Topics

Rule 5 – Low Flying

Recently there has been much discussion about the new EASA changes governing the low flying rules. Although no flight below 500ft has been mentioned by EASA, at present the CAA has not adopted this and will not implement its interpretation until December 2014. So in the meantime we are still governed by rule 5 - "Except with the written permission of the CAA, an aircraft shall not be flown closer than 500 feet to any person, vessel, vehicle or structure. An aircraft flying over a congested area of a city town or settlement shall not fly below a height of 1,000 feet above the highest fixed obstacle within a horizontal radius of 600 metres of the aircraft. An aircraft flying over a congested area of a city, town or settlement shall not fly below such height as would permit the aircraft to land clear of the congested area in the event of a power unit failure." - CAP393 section 2 page 6.

Cosgrove 8th Edition?

Yes, it's here! The Microlight Pilots Handbook by Brian Cosgrove has been serious updated and is available now. Also Geoff Weighell's 'Air Law for Microlight Pilots' has been revised and updated. It will be available soon.

NPPL Applications

Unfortunately, the licence Administrator at the BMAA office receives many incomplete or incorrect NPPL applications. A simple way to check your students application is to go through the NPPL check list on the BMAA site and also read the NPPL application in full to confirm all items have been checked. These can be found here http://www.bmaa.org/pwpcontrol.php?wplID=10317 (Alternatively, contact the BMAA office if you are unsure of the exact requirements given your case). Remember that the fee for the NPPL application has been changed. One part goes to the
CAA and the other to the BMAA. Further details can be found on the BMAA website under the 'Information Library' then 'Pilot Licensing Information' or follow this link http://bmaa.org/files/appendix_a_2013_issue_1.pdf

Lessons Learnt

Did you cover all the syllabus?

Yet another great day for solo. Joe was ready and just needed a check out. After a couple of circuits, it was decided. Let's taxi back and get some ballast in the back seat ready to go. So, off he goes, checks complete, lined up and off... circuit is good. Wait... helicopter manouevring into his landing area. But he will see this and elect to go around.. Didn't we teach him about wake turbulence from helicopters? Oh, no he's continuing approach.. the helicopter is just to the side of the runway... he rounds out he starts to hold off. Now he's up, down, banked, straight... Oh, I can't watch.. I don't know how, but he's back on the ground safely. After taxying in he was debriefed. "Helicopters? What they make turbulence? Oh, I didn't know." Stupid student didn't he learn about that in his...? training? Oh, yes, hands up, maybe we should have stressed that more clearly during his training!

Are we being imaginative enough?

We're all aware that we need to use different instructional techniques for different students. We're all familiar with those instructor revalidation questions that ask how we would deal with under-confident nervous students, over-confident arrogant students, elderly forgetful students and youngsters who want to rush ahead. In reality, however, our most challenging students don't fit neatly into these boxes; they have personality traits that are complex and often contradictory.

Are we really being as imaginative as we can in coming up with strategies tailored to suit the individual? Or are we sometimes so intent on ensuring that they receive our 'standard' briefing that we don't take time to get to know them or to really listen to what they are saying and to work out what could be at the root of their problem? How good are we at thinking of new ways of saying the same thing and of making an exercise that has become tedious seem fun again?

We thought it might be useful to consider a different student profile in each of the next few newsletters, so that we can share our ideas, tips and success stories.

Student profile No. 1

A male in his mid sixties has been training for about 3 years. He still works and is fairly sharp. He only has lessons on a Saturday and consequently misses quite a few due to weather. His general handling skills are fine, but his performance in circuit is poor. He struggles to line up with the runway and/or with the final stage of the landing and is slow to respond to what happens, sometimes seeming unaware of the situation. By the end of most lessons there is an improvement, but this is not carried forward to the next lesson. Taking him out of circuit, navigation exercises and out-landings have kept him motivated, but he is no closer to going solo than he was 18 months ago. He has, at some point, flown with each of the 3 instructors at the school in the hope that a different emphasis or style might help something click, but to no avail. He is a lovely person and is still keen to learn.

What would you do with this student? What has worked for you in similar situations?

Safety First

Here follows a fictitious article to provoke discussion on the between instructors. We invite people to openly discuss ideas/responses on the Yahoo eGroup or email them directly to the editor which can be included in the next edition....
All Trim and Proper

Bill had been looking forward to today, but right now he wished he was anywhere but sitting in the aeroplane, staring down the nose at the broken propeller, knowing the nose wheel had collapsed and starting to think about how he could exit the forlorn craft. As the sirens got louder, his mind raced over thoughts at random, then assembled themselves into some sort of order...

Bill's first solo qualifying cross-country flight had been planned for today, and a long one at that – because his flying club used high performance microlights, they tended to select destinations that were significantly further away than the minimum. Two weeks previously, he'd done the route with his instructor and his navigation had been spot on, though his landing had been ragged, the instructor having to take over to control a developing balloon on round out.

They'd analysed it in the café before the return flight – inconsistent approach speed, forgetting to set the trim, resulting in a higher speed than was necessary for the round out phase. Bill kicked himself for it – why had he lost concentration like that? Secretly, Bill knew the answer but didn't want to admit it. A dull, nagging pain in his stomach reminded him that he had worries away from his beloved airfield and flying. Must make that appointment with the doctor next week, he thought, as his instructor told him they'd have to do some more circuit training to ensure he could competently and consistently handle the landing phase. The instructor too harboured secret thoughts that were as yet just a glimmer of a warning light. Bill had been a good pupil despite his advancing age. Likeable and good-humoured, he'd taken longer than average to get to solo standard, yet had up to this point proved to be consistent and reliable. Hmm, maybe a one-off? More circuits, just to make sure.

So, the following week saw Bill pounding the circuit again. Unfortunately his regular instructor was away that day so an AFI handled the session with him. It took 6 landings before the AFI pronounced that Bill's work was seeing results, now remembering to piece together the elements of the dance from downwind to base to final. Bill had felt a twinge as he got into the cockpit but said nothing – he was determined to improve his flying and get his licence and nothing was going to stop him. By the end of the circuit session he felt more tired than usual but the diligence had paid off and those landings were a lot better. Bill slept like a log as soon as he got home that night.

The week after was The Big Day. Bill was up early, checking the Met and NOTAMS, preparing his plan and route before setting off to the airfield. He knew the route well, both from the air and the ground and the winds were light and on the nose for the outbound trip – who needs a wind triangle on a day like this? And he'd be seeing the Quack next week to sort out those nagging tummy pains too. Just to make sure, he'd skipped breakfast today. Arriving at the club, he got the usual friendly welcome but two of the members actually asked him how he was, noticing his tired, drained appearance. Bill assured them he was fine and was looking forward to his flight. His instructor too, asked him how he was – twice – but seemed assured by Bill's cheery response. The PLOG looked good when checked, Bill certainly knew his stuff when it came to navigation, so the calls were made, the flight booked out and off he went to the aircraft.

His instructor, to be fair, had previously talked to last week's AFI on how the circuit session had gone and had been assured, but that nagging warning light was blinking – Bill didn't seem quite himself. Should he go for a circuit or two with him before letting him set off on his own? No, that might spook him and after all, he had more than 5 hours solo to his credit.

Bill clambered into the aircraft, once more feeling a twinge of pain and the nagging worry in his mind seemed to become more dominant. However, there was a job to be done and he was going to do it. He carried out the preflight and start-up checks, using the checklist but more by habit, barely reading the printed words, and taxied out to the hold. Everything seemed a little unreal, as if viewed through a slightly opaque window... c'mon Bill, concentrate lad! His instructors voice seemed to echo through his head as he went through the pre-takeoff drill, though a stab of pain caught him out and he had to get his breath back, interrupting his flow through the checklist ... where was I? Oh yes, Fuel, Flap.... ouch ..... Call for Clearance... with a busy traffic pattern, this took longer than usual, but eventually Bill received takeoff clearance...out onto the runway and ...
full power, keeping it straight.

As he picked up speed, Bill applied back pressure and the aircraft, reluctantly it seemed, lifted off, only for the nose to feel so heavy that Bill allowed it to drop to the ground. Two bounces, still on full power and it was again running along the ground. “Come on!” Bill shouted to no-one in the cockpit, as he once again raised the nose to lift off. Those on the ground who were watching saw the doomed craft hurtle down the runway in a series of bunny hops, with more than one bystander willing the pilot to pull back on the stick to get the aircraft into its natural element. But it never happened. After about the 10th bounce, the propeller disintegrated into shreds as the nosewheel folded back under the fuselage and saving Bill's life, the aircraft now powerless ground to a halt, nose grinding the tarmac, bang on the centreline.

One week later, Bill's life had changed and there were bigger challenges ahead following his medical check-up. He'd flown around the circuit again with his instructor and they'd worked out what had happened – and at last he had confided in his instructor and told him of his other problems. But for now, it seemed, all Bill's flying ambitions were on hold.

So, over to you, Dear Instructor. What else what you have done? With the benefit of hindsight, probably a lot more but hindsight is a wonderful thing.

1. What was the direct cause of the accident?
2. What were the contributing factors to the accident?
3. What else could have been done in the two weeks prior to the accident?
4. What scope is there for changes to the training content for all pupils and PPLs at this flying club?

**FIE Feedback**

It is nice to know what is expected from us during a 'Flying Instructor' test, so here is some feedback from FI examiners on elements found to be lacking:

**The Air Exercise and ‘Assisted Practice’**

The Instructor progresses from the Demo to the Student Practice with no Assisted Practice. The student is left to copy the Instructor’s Demo and the only assistance the student receives is criticism of his mistakes. Little or no instruction is given on how to achieve the correct handling.

It is important for students to be able to evaluate and work out problems for themselves otherwise they may become too dependent on the Instructor. However the student should not have to learn from his mistakes only. Without guided instruction there is also a danger the student may just be copying the Instructor’s Demo without understanding or anticipating specific elements of the exercise which could lead to unsafe handling in future flying.

**Ground Subjects**

Concerns have been raised on the apparent decline in Instructor's knowledge of the ground subjects. Concern has also been raised about the lack of ability to clearly explain/ teach ground school content from some Instructors. It is the Instructor’s responsibility to maintain an adequate level of knowledge in the ground subjects even if there is no ground school being provided by the Instructor. Good flying training goes hand in hand with ground training.

(Introducing the requirement earlier this year for all Instructors to use the Met Office information, e.g. Forms 215, 214, TAFs and METARs, and acquire Notams from an approved source is a step forward in standardisation of some content in the ground subjects and Instructor expectations at tests. Other specific elements of the ground subjects may be similarly considered required knowledge for a successful test result. You will, of course, be informed of any developments).

**Accepting an aircraft for the Flight Test**

Tests are often delayed when the Examiner cannot find evidence that the required airframe and engine maintenance on the aircraft provided for the test has been carried out. At times Examiners
have to resort to lengthy investigations to find out whether or not they can accept the aircraft for flight, not a welcomed delay by either party in what can already be a long day.

**Technical**

Each issue will have a technical article that is topical amongst panel examiners.

**Vx and Vy – An explanation as an aid to instructors by Marcus Dalgetty.**

This article is written to help some of our BMAA instructors to have a greater understanding of how to explain the “best rate” versus the “best angle” of climb. For those of you who are fully versed in this subject then you need not read any further. However there are many instructors who have taken their depth of knowledge further than the explanation that may be found in Cosgrove’s book. As instructors we are charged with having a greater depth of knowledge that shows that we really understand the subject and that we can explain this topic to both a student and to an examiner or perhaps to an AFI instructor to assist his progress in his role.

Many of you will be aware of the simple diagram that is shown in textbooks that shows a tree at the end of the runway and we have two options. Firstly we can attempt to climb at “best rate” of climb to clear the obstacle but the example is often laid out that “best rate” will not suffice as the obstacle is too close to allow sufficient clearance after take off. The solution proposed by this diagram is to climb at “best angle” thus allowing the obstacle to be cleared. I have often found this diagram lacking as it suggests that the obstacle may be cleared by climbing at a low airspeed when close to the ground. A we all know this is inherently dangerous as an engine failure whilst close to the ground on climb out will result in a very nasty accident if “best angle” is chosen as the speed to climb. Normal practice is to take off and climb at a safe airspeed until at least 2-300 feet and then to steepen the climb if we wish to gain altitude quickly. However the “tree at the end of the runway” example suggests that we should steepen our climb early and thus all will be well……until the engine stops! The diagram may well be better drawn to show a cloud ahead or indeed some airspace that needs to be cleared rather than obstacles on the ground. Otherwise we will find new pilot’s climbing out with a perilously high angle of attack. After all, a safe place to fly from should not require climbing out at “best angle” to clear the trees …..unless your Rotax comes with a guarantee from a higher power.
Many instructors are unclear on the basic definition of “best rate” and “best angle” and often find it difficult to do justice to presenting a clean cut explanation. So let’s start from here and take things forward.

Let’s look at each in turn:

\(Vy\) is the airspeed needed in order to gain the greatest amount of altitude over time i.e. best rate of climb. This speed will vary depending on type etc and can be found in the POH for the aircraft concerned. Normally this figure is quoted at the maximum all up weight.

\(Vx\) is the airspeed needed in order to gain the greatest amount of altitude over the distance travelled along the ground, i.e. the steepest climb. It should be noted that \(Vx\) should not be employed below a height that will not allow safe landing in the event of an engine failure.

So we now have the basic definition in place and thus we may proceed to an explanation in greater depth.

Let’s consider \(Vy\) first of all. In order to understand we need to look at the relationship between the power required and the power available. Power required may be calculated by multiplying the drag at a given airspeed by the airspeed itself. Total drag is a composite of induced and parasitic drag with either one of these players being more significant depending on our airspeed. At a lower airspeed we suffer more induced drag as we have greater span wise flow leading to larger tip vortices. At higher airspeeds, with a lower angle of attack, we suffer an increase in parasitic drag which will require more power to remain straight and level flight. All in all our overall drag may be seen as a U shaped curve with a region of low drag roughly in the middle of the speed range. If we look at the power required curve (drag multiplied by airspeed) it bears a certain resemblance to the overall drag curve. So power required at lower airspeeds will be high as will power required at high airspeeds. Now depending on the power plant that we have there will be a certain amount of power available. An engine’s ability to produce power is a combination of bore, stroke, calorific value of fuel and compression ratio. The final element is the RPM we are using. All of this multiplied together gives us the power available. As we apply power on take off, we will achieve a certain number of RPM which will be close to what the engine will produce on a static ground test. As we
accelerate the angle of attack on the prop will reduce (due to the change in the relative airflow) and thus the engine can start to liberate a little more power due to the RPM increase. (Note: all of this is assuming a fixed pitch prop is fitted). Thus power available will increase slightly as we increase our airspeed. If we compare the power required (drag multiplied by airspeed) versus the power available then the point where we have the greatest difference is where Vy may be found. This is to say that we have the greatest excess of power over the power required and thus with all this excess horsepower we will achieve the greatest rate of climb.

Where the power available curve cuts across the power required curve we can see that the aircraft has reached the maximum straight and level speed. Job done!

Now onto Vx. To consider Vx we need to look at the relationship between the thrust available and the overall drag.

This model bears some resemblance to Vy although we are looking at different variables. If we take a fixed pitch prop then we will have the highest amount of thrust at low airspeed as the propeller is at it’s highest angle of attack. Sometimes it may even be slightly stalled until we achieve a certain airspeed. As the aircraft accelerates then the thrust will reduce slightly as the propeller is no longer displacing quite as much air on each revolution. At a certain airspeed we will have the greatest excess of thrust over drag. This is what you need to gain the maximum amount of altitude in the shortest distance travelled. Vx is often quite close to Vy although is at a slightly lower airspeed.

So there we have it Vx and Vy hopefully explained in a little more detail. Watch out for the trees!
**What's on**

*The Flying Show - The NEC, Birmingham - 30th November / 1st December 2013*

Some of us will be at the show, so please feel free to come and chat, maybe bring up a topic that you would like to be discussed at the Instructor Seminar, or just a question for the committee.

*BMAA Instructor Seminar – Sywell Aerodrome – Tuesday 25th February 2014*

We hope that as many of you as possible will be able to attend the Instructor Seminar. Those who wish to join us on the evening of Monday 24th for a drink and catch-up will be very welcome.

**Final Matters**

*BMAA Instructor eGroup*

It was noted that the BMAA Instructor eGroup on Yahoo is a vital part of our communications between instructors. This should be a focal point for sharing ideas, information and a repository for previously asked questions. If you are not already subscribed, don't miss out on the opportunity to share and discuss your views. Subscribe today at [http://bit.ly/InstGroup](http://bit.ly/InstGroup)

**Hmm why don't you say something about...**

Any ideas or interesting subjects you want to share. Please contact us on the BMAA Instructor eGroup or email the editor directly.

**Where is GASCo?**

Yes, GASCo has been and is still the best way to keep up to date with flight safety issues, changes in legislation, licensing etc and provides a condensed accident reports to make us all think. It used to be sent to instructors (and aircraft owners) free of charge but has now become subscription only due to lack of funding, but at £16 per year a real bargain.

One item of news from the CAA recently is the implementation of Radio Mandatory Zones, similar to Transponder Mandatory Zones.

This can be seen here [http://www.caa.co.uk/docs/33/20130809RMZPolicyDocumentFinal.pdf](http://www.caa.co.uk/docs/33/20130809RMZPolicyDocumentFinal.pdf).

Wouldn't it be a good idea to subscribe and get the latest from the CAA?

**Next Issue**

The next issue of 'Microlight Training' will be published in December. If you have any questions, ideas or an article you would like publishing then please do not hesitate to contact me directly at editor@microlighttraining.co.uk

**Links:**

- BMAA Knowledge Base: [http://faq.microlighttraining.co.uk](http://faq.microlighttraining.co.uk)