

The official BMAA guide to

microlighting

Free



**Welcome to the
world of microlights!**

Affordable flying for all!

Published by the British Microlight Aircraft Association



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Front cover A Quik flexwing from P&M and a fixed-wing Skyranger (photo: Steve Grimshaw)

This page Pilot Mark Macrea coasting over the beach (photo: Stuart Buchanan)



WELCOME to the British Microlight Aircraft Association Official Guide to Microlighting! This guide aims to give you an all-round understanding of what can be found and achieved within the wonderful world of microlighting.

The ability to fly has been a dream of so many since that first flight by the Wright brothers in 1903. The BMAA has been in existence since 1980, supporting and helping people fulfil that dream.

Microlighting makes flying accessible to all, offering an affordable and fun way to take to the skies. There are many microlight training schools around the UK, giving you the opportunity to take a trial flight or a full course of training leading to a Private Pilot's Licence.

The term "microlight" is based upon the aircraft having a maximum of two seats and being within a certain weight parameter. The most popular types of microlight are flexwing and fixed-wing planes, which you can find more about in Section 4.

Welcome to the world of microlighting!

1 Introduction

Going solo: A feeling I will never forget By Dan Roach

GLANCING across at the empty passenger seat I laughed out loud. I was pilot-in-command of an aircraft for the first time and I couldn't believe it.

I'd wanted to learn to fly since I was a little boy, but it was something that seemed far out of reach. And then I heard about microlight aircraft.

Just over three months had passed since, at the tender age of 38, I first walked through the door of my local flying school. I had only intended to enquire about microlight flying, but Marcus made me feel so at ease that when he assumed that I wanted to book a lesson, I simply said yes. My perception that aviation is some kind of exclusive club had been totally misguided.

Less than two weeks later I was strapping in to a Eurostar (or in my mind, a small fighter plane) for my first lesson. I could almost hear the *Top Gun* theme tune and made a mental note to get some aviator sunglasses.

"Right, get the checklist out," smiled Marcus.

Wow, I was going to be part of the flight crew from minute one! This was even better than I had thought. I was a little nervous when Marcus asked me to start the checks, but he knew exactly how much to push me and when to ease off.

After I'd taxied out to the hold and completed the remain-

ing checks, supervised by Marcus, he took control to take us into the skies. And that was when I experienced "that view" on what was a crystal-clear winter's day.

I remember thinking, "You get paid to do this?" Reading my mind, Marcus grinned. "Welcome to my office. What do you think of the view?" My smile perfectly reflected the emotions I was feeling.

Three months later I was flying downwind and preparing for my first solo landing. Was I nervous, scared, worried when Marcus hopped out of the cockpit and nonchalantly announced, "I'm off to get a cup of tea. You can go and do that on your own now"? Briefly, yes, but the training and teaching in the BMAA syllabus are superb, and as soon as he got out my focus switched to using the skills and following the procedures that I had been taught.

I've flown many hours now and my aviators are well worn, but that first solo was indescribably special. It was 15 minutes that felt like 15 seconds, and it's a memory I will cherish for the rest of my life. □



2 History

THE British microlight movement really got underway in the early 1980s. Hang gliders had developed from float-down-the-hill machines to ridge soaring with some cross-country capability.

Of course, soon pilots looked at ways of getting airborne without climbing up a hill. Winch launching was proving tricky to get right, so someone just put an engine on a hang glider (photo 1, opposite) and it became a yet-to-be-named aircraft type, the microlight.

Not long afterwards, simple wheeled structures were developed to hold the engine and seat, and so the first “trikes” were born (photo 2). At the same time, other strange flying contraptions were being created that were loosely based on fixed-wing aircraft with aerodynamic controls. These were largely American designs that found their way to the UK.

As the microlight movement grew, the UK Civil Aviation Authority (CAA) decided that there should be regulation to control pilot licensing and aircraft airworthiness. The BMAA was formed largely to manage this threat. By the end of 1982, the BMAA had 2500 members and was negotiating licensing and airworthiness with the CAA. By 1984, all new aircraft had to comply with Permit to Fly airworthiness regulations and all pilots had to have licenses.

The BMAA developed as an organisation to challenge regulation and make a name as a strong voice for its members. Competition flying started in 1984, with the British team winning the first World Microlight Championships in 1985. Ever since then, the British team has won many team and individual events.

As microlighting became more popular, aircraft became more capable. Flexwing design changed radically when the definition of a microlight was changed, allowing heavier aircraft and smaller wings. The Pegasus Quik (see p7) was the first flexwing that could truly maintain level flight at 100mph. An example of this type was the first microlight to fly a pre-planned route of 1000 nautical miles in one day.

The strange contraptions that had come from America and France emulating conventional aircraft types also developed into more recognisable conventional aircraft shapes. An early aircraft was the Shadow (photo 4). First as a single-seat aircraft and later as a two-seater, it became very popular and identifiable with its high wing and tandem seating arrangement. The Thruster design from Australia (see p9) became a school standard, later challenged by the

AX3 (photo 5) and AX2000, all aircraft made of traditional materials; aluminium tube and fabric covering.

The changes in definition also allowed three-axis aircraft to develop, and in 1999 Skydrive introduced the first aluminium microlight, the EV-97 Eurostar (see p8). This aircraft has been extremely popular with schools and pilots and is still going strong 20 years on. Another very popular three-axis aircraft is the Ikarus C42 tube and fabric aircraft, available as a kit or factory-built.

Although at the very start of UK microlight flying pilots were enthusiastic builders and tinkerers, many now buy factory-produced aircraft. There are kits available such as the Skyranger (see front cover and p13). Sold in the UK by Flylight Airsports, hundreds of examples are flying in the UK.

So, from the very simple “daredevil” constructions of 40 years ago, UK microlighting has come a long way to become a very civilised form of recreational aviation. Microlight pilots all have one thing in common though: they do it for the love of flying, the camaraderie and the joy the sport shares with all microlight enthusiasts!

To see a more detailed history of UK microlighting visit our website, bmaa.org. □

Photos

- 1 A Soarmaster powered hang glider from 1978
- 2 A typical early trike, the Mainair Rapier of 1983 (photo: Derek Allen)
- 3 The canard-winged Pterodactyl was a popular early American design. This particular example, despite dating from the early 1980s, is still in good flying order (photo: Roger Patrick)
- 4 The Shadow featured a high-wing and tandem seating (photo: Keith Negal)
- 5 The AX3 is a fixed-wing but is made from tube and fabric like a flexwing

3 Learning to fly

LEARNING to fly is one of the most rewarding of challenges. Students remember their first solo and their GST (General Skills Test) for the rest of their lives.

Anyone planning to learn wants to know how it all works, how much it will cost and how long it will take.

The National Private Pilot's Licence (NPPL) microlight rating requires a minimum of 25 hours flying training, 10 of which must be solo. A few achieve their licences within weeks, but others can take a year or so.

There is also a restricted licence that requires at least 15 hours training, which means you can only fly solo and you are able to fly no more than eight miles from your takeoff point. This option can be a good first step towards gaining your full licence.

The cost of training varies widely, depending on a number of factors, including:

- Your and your instructor's availability. The more you fly, the faster you learn. At least once a week is best, if you have the funds and the time.
- Weather. If it's good, progress can be made surprisingly

Photos A fixed-wing EV-97 Eurostar SL (left); and a flexwing Quik from P&M Aviation (right; photo: East of Scotland Microlights)



quickly, but if bad weather causes delays some schools offer intensive courses, both in the UK and abroad so you can learn in more consistent weather conditions.

There is an age limit of 14 for learning to fly. At 16 you can fly solo and at 17 you can take your GST flight exam, which will give you your Microlight NPPL. You are then able to take to the skies and can carry on flying for life, so long as the CAA licensing rules are followed and your licence is kept current.

Because the microlight category has a maximum all-up weight, there are restrictions on maximum seat weight of 90–120kg, depending on the type of aircraft. Contact the BMAA for more information.

You don't have to pay for an expensive medical. If you're fit

to drive a car, and not on current medication for psychiatric problems, you're fit to fly.

A budget of £3000 to £4500 should cover your training, including both flying and groundschool, compared to £8000 to £11,000 for a light aircraft licence.

The flying will involve progressing from straight and level flight and simple turns, to taking off and landing, dealing with emergencies, and other skills, until that magical moment when the instructor steps out and sends you on your first solo circuit. No one ever forgets it.

After that, there's more solo taking off and landing, then cross-country flights, at first with the instructor, then solo, until you're ready for your General Skills Test and that unforgettable moment when you are awarded your wings.

Along with the flight test there are also five ground exams that need to be passed. If the thought of groundschool study and exams worries you, don't let them. You have the support of your instructor, you can take groundschool classes in all subjects, and each subject relates to what goes on in the air whilst flying. They are much easier to understand when put into that context.

There are five multiple-choice exams:

- Air Law
- Navigation
- Meteorology
- Aircraft Technical
- Human Factors



The Aircraft Technical exam ensures that the student pilot understands how the aircraft flies and how its engine and control systems work. It also covers the factors that affect aircraft performance.

Air Law training ensures that the pilot understands how the laws of the air apply to him or her.

Navigation training provides pilots with the necessary skills and knowledge to plan before a flight and then fly to that plan, knowing at all times where they are and how to get where they want to go. These days many pilots also use a GPS as backup, but the training is still crucial.

Meteorology lessons give a sufficient understanding of the weather, and how it affects the performance and safety of the aircraft, so that the pilot can know when it is safe to fly

and when it is not, and can anticipate and plan for changes to the weather during a flight.

Human Factors covers all the different factors that can affect the way a pilot performs in flight.

You can find the BMAA syllabus at bmaa.org. There are many microlight training facilities throughout the UK: visit bmaa.org/try-microlighting/schools-and-clubs to find where you can visit your local school. □





4 The types of microlight

Microlight aircraft are defined by maximum weight – 450kg for two seat and 300kg for single seat – and a maximum stall speed of 35kts. They can have one or two seats, not more. There are three different control types: three-axis, weightshift and parachute

Fixed-wing

BET your first thought was: “Hang on, that isn’t a microlight! – that looks like a plane!”

Thanks to the rapid technical advances possible with the relatively light regulation required for microlights, the performance of the newer fixed-wing versions outstrips that of the traditional light aircraft you see at airfields, and by a considerable margin. They use smaller airfields, fly faster and cost less to buy and maintain. In fact, they are so good that many pilots of heavier aircraft are changing to flying microlights.

Most fixed-wing microlights are fully enclosed, though many of the older ones just have a windscreen. Mostly you sit side by side, which is more sociable than tandem seating!

You’ll have headsets and an intercom to talk to each other in flight, but helmets are very rarely used. On the ground, you steer using the rudder pedals – push left to go left – and control your speed using the throttle and brakes. In the air the main control is the joystick. Some have a single central stick which

you share, and some have individual floor-mounted sticks in front of each seat. In either case the aircraft follows the stick: move it forward and the aircraft points down and speeds up; pull it back and the aircraft climbs and slows, meaning it’s usually time for a spot of throttle. Move the stick to the left or right, and the aircraft banks that way.

Fully enclosed cabins offer increased comfort, particularly for non-flying partners and friends. In fact, many modern fixed-wings come with heated cabins.

Generally, fixed-wing aircraft need to be kept in a hangar at the airfield. A few can be folded and taken home on a trailer.

Prices for fixed-wing machines are usually a little more than for flexwings; older ones that do around 50mph can be as little as £4000 secondhand, but if you’re looking to buy new, prices start at approximately £28,000. The more luxurious models can cost in excess of £100,000.

Mind you, for the top price you’ll get a machine that will fly off something as short as a 150m runway, cruise at 130mph or fly flat out at 160mph, can be self-maintained, use as little as 10 litres of fuel an hour and could fly non-stop from London to Madrid. ▷

Facing page EV-97 Eurostar (photo: Paul Kiddell)

This page Thruster Sprint from Thruster Air Services (photo: Ken Crompton)





Flexwing

FOR most people, flexwings are the definitive microlight, with a hang-glider-style wing that is flexible like a sail – hence the name. You can get foot-launched flexwings, known as powered hang gliders, but most people choose wheeled versions, colloquially known as trikes. They are a bit like aerial motorbikes: the pilot sits in the front with the passenger tucked in close behind.

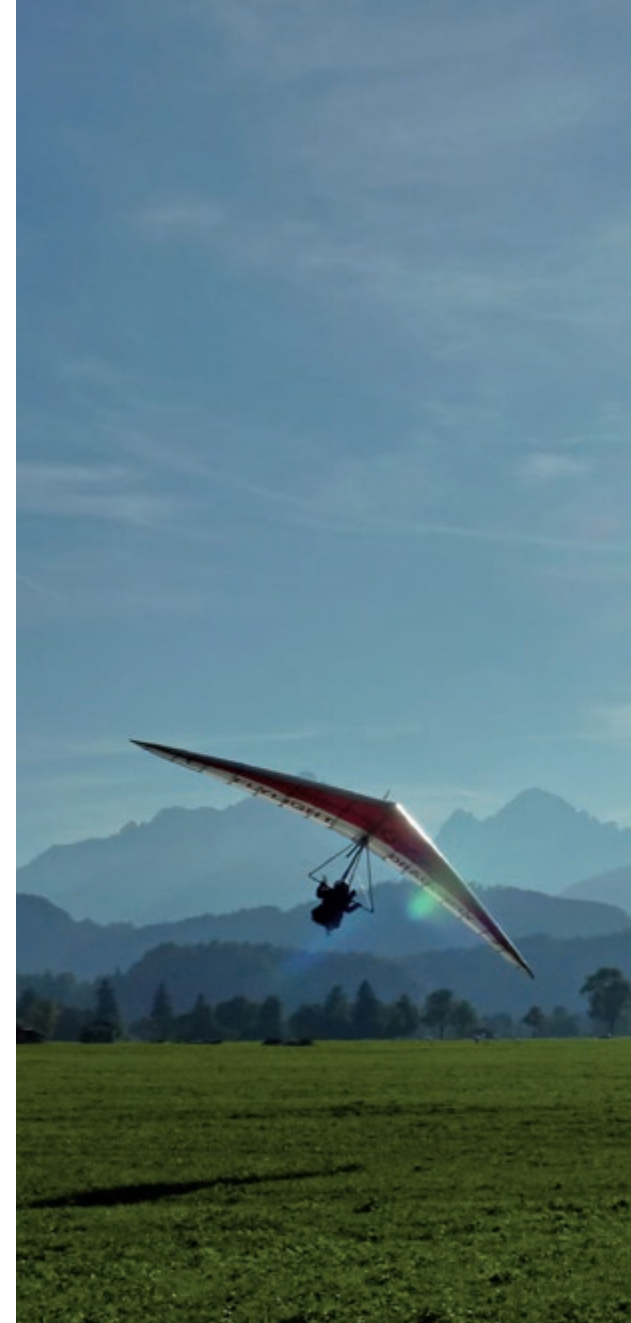
To continue the motorbike analogy, to keep warm you'll need a flying suit and a full-face helmet to keep the wind off your face and allow you to hear each other through the intercom. Your school will provide these for your training.

On the ground, you steer the front wheel with your feet. The aircraft also has a footbrake on the left and a foot throttle on the right. When in flight, you manoeuvre the aircraft by using the base bar of the wing: bar forwards, pitch up, or fly slowly; bar back, pitch down or fly fast, in conjunction with power increases or decreases. Pull the right wingtip down to go right; pull the left wingtip down to go left.

The view is unparalleled, and the direct connection with the controls makes you feel in closer contact with the air than with any other form of powered flying. It's a buzz that never loses its appeal.

When you've finished flying, you can fold the wing up and trailer the trike home, though many owners prefer the convenience of keeping them rigged in a hangar at the airfield.

There's a huge choice of types. Older machines are perfectly serviceable, will do 50mph and are available from about £2000. If you want to buy new, prices range from £10,000 to £65,000 – enough to buy an aircraft that can cruise at 100mph and is a serious touring machine. How serious? They've been flown around the world – that's how serious!



Powered parachutes

IF circumstances rule out pursuing a full microlight pilot's licence, there are always powered parachutes.

You will need a pilot's licence to fly one, but it's simpler and quicker to get than for other microlights, and there are only three controls: the throttle and two lines. The throttle makes you climb or descend, and you pull the left line to turn left, and vice versa. Simple. On some models, the lines are connected to foot pedals.

With a cruising speed of around 45mph, you can show your friends round the local scenery, and when you land, the whole ensemble lives on a trailer that will fit in your garage.

Single-seat deregulated microlights (SSDR)

SINGLE-seat microlights can be flexwing or fixed wing, or powered parachutes. They have a maximum take-off weight including the pilot of 300kg. For this type you need a licence to fly but you do not need an aircraft permit; this reduces the cost and allows for development, such as experiments with engines, propellers and so on. SSDR offers an affordable and fun style of flying, and the plane can be small enough to be housed in a trailer or even in the boot of your car. □

Photos, from far left Pegasus Quantum flexwing (photo: Gavin Clark); playtime in a Flylight Dragonfly SSDR microlight (Ben Ashman); and Aerochute Dual





5 Owning a microlight

ONCE you have decided to fly microlights you may want to take the decision to purchase your own aircraft. You can do this by looking at the secondhand market or buying from new, giving you flexibility to purchase within your budget. There are a variety of different types, styles and models to choose from within the aircraft marketplace.

Another possibility – and one that is maybe more cost effective – is to become a shareholder within a syndicate, a group of people who share ownership and responsibilities for the care of an aircraft. It is also possible to hire a microlight by the hour at certain airfields and clubs.

Aircraft are normally hangared or kept at an airfield, which will incur a monthly fee payable to the proprietor or owner. Some microlights can be trailered home for safekeeping, and are rigged and de-rigged for flying.

Just like a car, most aircraft will also need an annual inspection for a permit to fly, similar to an MOT, and will also need to be insured.

For more information visit bmaa.org. □



Left A syndicate can be a great way to go flying on a budget

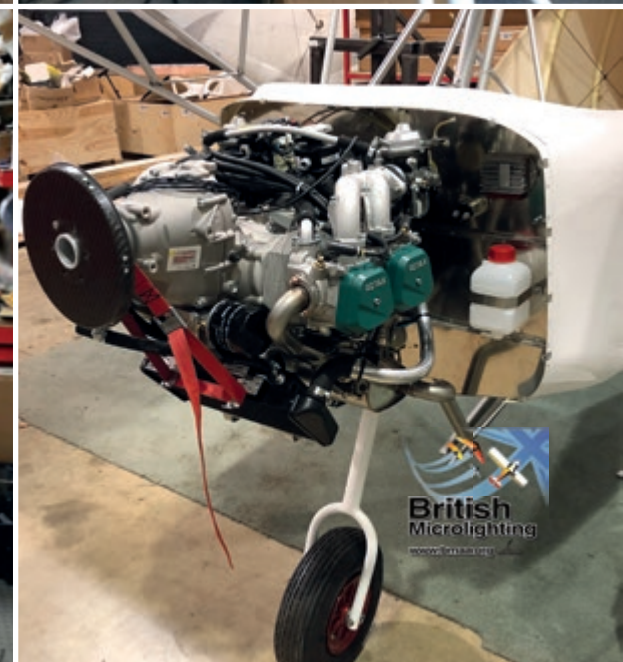
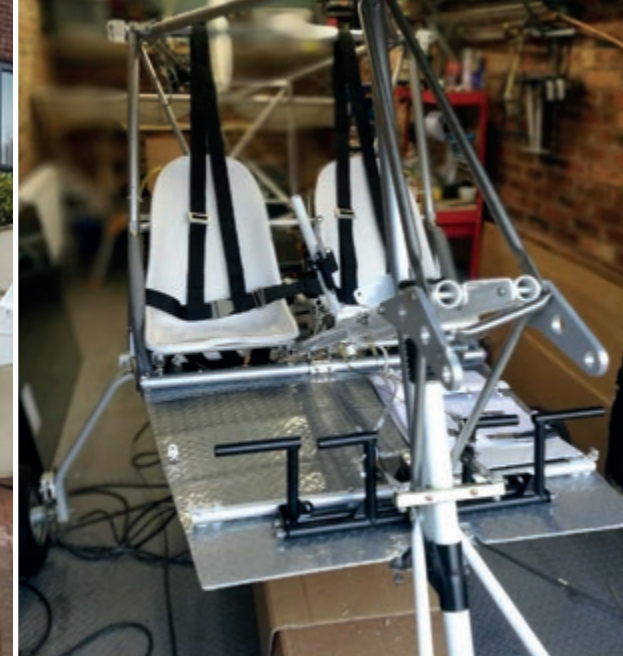
6 Build your own plane

YES! It is possible to build your own plane; lots of people do. If you are the type of person who might enjoy the challenge of building your own plane, there are several kits available to buy.

You will need a work space that will be inspected, which could simply be a garage at home. The kit will arrive with a build manual and you will have the support of the kit manufacturer to help you along the way, plus a local BMAA inspector who will visit several times during the build to ensure all steps are followed and that the build quality is up to standard.

Very few specialist tools are required to build your own plane; you just need patience, time and skill. Once the build is complete and the aircraft has been registered and insured it would be taken to an airfield for a test flight by a BMAA test pilot. It would then be signed off ready to receive its permit to fly, after which will come your proudest moment: to take to the sky in a plane built by your own fair hands! □

Right A Skyranger under construction. This aircraft is one of Britain's most popular kits (photos: Pete and Mandy Jenkins)





This page
White cliffs (photo: Andrew Fell)

Facing page
Microlight world champion David Broom at the 2015 World Air Games, Dubai (photo: Marcus King/James Pagram)

7 BMAA initiatives

The BMAA has many initiatives to support, encourage and grow the microlight community. Described here are four such initiatives; for the complete picture visit bmaa.org

Competitions

THE BMAA Open Series competition has been designed to take the best bits of some competition tasks and make them better, to use the fun side of any task and to dispense with the over-complicated parts. Reconnecting each task with the actual flying skill, it was designed to include precision landings, short-field operation, strong navigational skills and effective use of GPS navigation tools.

Events are held up and down the country during the flying season, each one organised by a team of volunteers who marshal the event, organise food and refreshments all weekend, and keep everyone topped up with fuel as they require. Each event levies a small fee to cover costs such as landing fees and camping facilities; competitors otherwise need only pay for their meals. All great fun and, most importantly, increasing pilot skills and camaraderie!

Events

THERE are many organised events all over the UK and abroad that bring the microlight world together: fly-ins, air displays, competitions and many more! For more information on what is happening, or for more information on any of the BMAA initiatives, visit bmaa.org.

Support programmes

THE BMAA encourages all to discover and enjoy the world of microlight flying. The number of female pilots is growing year on year and more and more disabled flyers are now participating, competing and organising wonderful flights for charity.

BMAA Wings award scheme

THE BMAA Wings scheme is designed to encourage BMAA members to continue to improve their flight planning, their aircraft handling skills and their understanding of aviation safety. The aim throughout is for the BMAA member to become a safer and better pilot.

The Wings scheme has four levels of award: Bronze, Silver, Gold and Diamond. To qualify for each level, the pilot will gain achievements from a selection of flight, educational and safety tasks. After the first Bronze Award, each level becomes slightly more demanding, encouraging pilots to expand their skills and knowledge, while having fun and becoming a better pilot. □





8 Youth schemes

New Horizons Build-a-Plane project

IN 2013 the BMAA purchased an aircraft kit to be constructed by students in a school in Coventry. The New Horizons projects are just one way that the BMAA encourages young people to become interested and engaged in aviation. The first aircraft was completed by the students and is now flying, owned by a BMAA member.

Further aircraft have been built by groups of young people in schools, colleges and other youth groups. Builders have gained practical experience of engineering as they construct the kit; they also learn about aerodynamics, aviation history and modern aviation. Some students have recorded and published the build using social media, encouraging other groups to ask for BMAA projects.

Any group can apply for a New Horizons aircraft; they will need suitable premises and someone with build experience to oversee the project. The BMAA pays for the kit, so there is very little cost to the builders.

Left Bursary award winners Lucinda Beeson (1) and Thomas Palmer (2) – that first solo means the world to a young pilot; and (3) Benenden School girls with the Skyranger Swift they built, with appropriate registration

Right Connor Foster, recipient of a BMAA bursary

The Bursary scheme

“My favourite thing about flying is the satisfaction you feel crossing the hedge at the end of the strip on a perfect approach. There is something very gratifying about gradually flaring and the plane gently sinking to the ground under your control

– 17-year-old Lucinda Beeson,
Bursary award winner

WE think almost every airfield has an enthusiastic youngster who shows up every weekend and is happy to clean, work and do pretty much anything to get a flight. For some, just being given the opportunity to talk flying with those who have climbed the dizzy heights to attaining a licence is enough to keep up the weekend pilgrimage to the local airfield.

It is exactly these people that the BMAA wishes to support, to bring their NPPL a little step closer and the next World Champion a natural next progression!

We award funding each year to selected candidates between the ages of 15 and 20 on the date of the award. In order to qualify they must show some history of an interest in microlighting and will be selected by an appointed panel. There will be some additional flying and ground-based assessments to ensure we get exactly the right people. □



9 The BMAA: Who we are

THE BMAA is the national association formed by microlight pilots with the sole intention of always getting the best of everything for our members so that we can continue to fly our very special aircraft for pure enjoyment and fun.

Since its formation in 1980 the BMAA has been pivotal in influencing the aviation regulators, the Civil Aviation Authority (CAA) and the Department for Transport (DfT), to ensure that regulation encourages microlight flying rather than stifles it. We have been very successful: for example the syllabus for training to gain the microlight pilot's licence was written by the BMAA and is continually reviewed to ensure it remains valid and proportionate as UK microlighting develops. We also negotiated a simple level of medical standard for microlight pilots at a time when other forms of aviation must meet increasing levels.

The BMAA employs staff who are experts in pilot licensing, aeronautical engineering and aviation regulation. The engineers are approved by the CAA to ensure that aircraft designs meet the legal structural and flight handling requirements dictated by the CAA. The cost to members of the engineering services provided by the BMAA is significantly less than going to outside sources or the CAA themselves.

All UK recreational aviation is under a constant threat of loss of airspace to fly in and airfields to fly from. The BMAA is very active with other recreational aviation groups in representing our interests in these areas; helping

to influence regulation and protect our flying environment. These groups include the All-Party Parliamentary Group for General Aviation, the General Aviation Alliance and the General Aviation Awareness Council.

As a BMAA member you will benefit from the support of an organisation dedicated to the sport of microlight flying. You will be able to access technical services and ask any number of questions and for advice to help you get the most out of your flying.

To keep you informed and entertained, your membership includes a full-colour magazine posted to you every month, full of interesting stories, readers' letters, technical and safety matters, flight tests, a quiz and much more.

You can also subscribe to an online mid-month newsletter with great microlight and general flying videos and all the entries to our monthly picture competition. The BMAA website is also full of information to assist members and carries news and event information.

We at the BMAA hope you have enjoyed reading the *Official Guide to Microlighting* and that you have learned something about our sport and how you can take part.

To join the BMAA, please head to bmaa.org/membership where you will find our application page. There is even a monthly payment option to spread the cost of your membership. We look forward to welcoming you on board! □

BMAA trial flight

If you would like to take to the skies with a BMAA instructor to try a fixed-wing or flexwing microlight flight for yourself or as a gift, the BMAA has trial flight vouchers available to purchase. They are available online at:

bmaa.org/try-microlighting/flight-training-vouchers

Student in training discount

If you are a student pilot in training and would like to join and support the BMAA, please follow the link to receive a special discounted rate for flight students. You will gain all the benefits of the BMAA membership at a special discounted rate! Welcome!

bmaa.org/the-bmaa/membership-join-or-renew

BMAA membership

If you would like to join and support the BMAA in the work that we do, you can apply online for a variety of different memberships. Becoming a member allows you access to the BMAA website, expert advice, support and a monthly subscription to *Microlight Flying* magazine. Please follow the link to sign up!

bmaa.org/the-bmaa/membership-join-or-renew

Photo
P&M Aviation QuikR (photo: Tim Jackson)



Quiksand

P&M Aviation Quik flexwings on the beach at Pilling, Lancashire (photo: Steve Grimshaw)

BMAA
The Bullring, Deddington
Banbury, Oxford OX15 0TT
tel 01869 338888

**British
Microlighting**
www.bmaa.org

