Flightlines



Inside this edition;

Paper Aeroplanes The Fokker Triplane Handling Tail-draggers



October 2011

ety of models were flown but stunters dominated. As usual Ralph McCarthy's mother baked a magnificent cake to feed the The Shannon MFC control-line fly-in in April. There was a good turn out, great weather and lots of flying. A wide varihungry flyers.



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On the Cover: Martin Mangam with his 1/3 scale Cub.

The next MACI Council meeting will take place on Tuesday January 17th 2012 in the Killeshin Hotel, Portlaoise, at 8:00pm.

The views expressed within are those of the individual contributors, and not necessarily those of the MACI Committee.

M.A.C.I. Executive Council and Officers 2011

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Editorial

It looks like I got things wrong in my last editorial when I commented that the competitions were all being run without many hitches. From what I can

now gather, event organisers have been having a torrid time due to the ongoing adverse weather conditions. One of the saddest stories to come out of this was that, after a good number of attempts to hold it, the Scale National Championships had, in the end, to be abandoned. I can confirm that every effort was made by the Scale Committee to facilitate the running of this event - but to no avail.

Yet another year has flown by, and this means that it's once again time for the MACI Annual General Meeting, (details on page 18). Anyone who attends will be made most welcome and it is open for all members to attend.

Just a reminder that the next issue of Flightlines is not due out until February next year. Please do not let this stop you from sending in articles and photographs, they are always welcome. I would like to take this opportunity to thank all of those people who have contributed to Flightlines over the past year. The content of the magazine is entirely dependent on your input, so please keep it coming.

To put my other hat on for the moment, my first year as Secretary General has been a very "interesting" one, with lots of issues arising to keep me busy. Can I thank my fellow Officers for helping me to cope! In particular, thanks go to the Chairperson, Tony Greene and the Treasurer Paul Duffy

Hope to see you at the AGM.

Safe Flying

Chris Clarke

Irish Aerobatic National Championships 2011.



Competitors at the 2011 Aerobatic National championships

Day 1

As you read this, winter has probably set in after what was not the best of competition seasons weather wise, this was my first event in 2011 due to being twice cancelled and missing one due to holidays.

The weekend of 13th and 14th of August were the dates for the 2011 Aerobatic champs this year and were held at the "Carron model flying club" site near Tipperary.

I must at this stage congratulate the Irish team on their performance at the world championships which were held in Muncie, Indiana. Angus finished in 19th place the best ever recorded by an Irish team member. Well done Shane, John and Angus. Christophe was once again to claim Glory.

After a very relaxed briefing models took to the skies with tier 1 under the watch full eye of CD Brian Carolan. The round comprised of 6 pilots in all, 4 judges Dave Foley being the fixed sitting judge and 3 others made up from Tier 2 pilots, highest and lowest score to be dropped.

A very good demo flight was to be put in by the young James Murphy who was to prove himself later on.

Ray started the round flying the now familiar electric set up, only 1 fuel powered model in this tier and that was Shane with a new YS 175, for me it is still my chosen form of propulsion, hard to beat that sound, smell and all that goes on, I know all that mess.

2 electric models those of John Martin and Brian Carolan were equipped with contra rotating props.... interesting.

After round 1 it was Shane and the YS that were to take the 1000 points.

Tier 2 next up with 5 pilots, Gordon was to take this but the one to watch was James putting in a very good flight and getting a 963 normalised flight score, this is his first season flying F3A quite an achievement.

The weather was kind and allowed Rob to shine in the Masters duel with Paddy a pity more are not coming forward in this class. Due to a small turn out and favourable weather a second round was in before lunch.

Thanks Gordon, Sylvia and Kieth as always for the catering a great Bar-bque enjoyed by every one.

Lunch over and it was back to flying, a 3rd round of all classes was flown.

Tier 1 saw John clock up the 1000 to put towards a team placing. Competition at this level is close with Shane, Niall and John each taking a round.

In round 3 of tier 2 James was to show signs of things to come where he turned in a 999.2 against Gordon's 1000.

After Masters the F schedule was flown by John and Shane, Shane taking the honours, this was to be reversed in Sundays F round.

Day 2

Weather again was good, this allowed for a nice easy pace to proceedings as only one round was needed to complete the comp.

Shane on completion of round 4 now had 3000 points, using points from the F. $\,$

It was in Tier 2s final round where we saw James put in a very consistent flight and take a narrow victory over Gordon leaving him with a very credible final score of 2962.28

The duel for Masters slot continued where Paddy gave way to Rob.

Everyone again was well fed as the waited for the presentation of scores and final good byes. Once again many thanks to all for their participation in the event Pilots, judges, score keepers and catering it's what a good comp should be.

Position	Name	Score
1	Shane Robinson	3000.00
2	John Martin	2976.46
3	Niall O'Sullivan	2963.66
4	Ray Keane	2821.07
5	Brian Carolan	2816.75
6	Paul Houlihan	2577.19

Tier 1 final standings.

Tier 2 final standings.

Position	Name	Score
1	Gordon James	3000.00
2	James Murphy	2962.28
3	Leslie Cowpar	2745.61
4	Stu Holland	2501.54
5	Jim Howard	1954.85

Masters final standings.

Position	Name	Score
1	Rob Telford	3000.00
2	Paddy Gavin	

Leslie Cowpar IRL 2200



Ulster Control Line Championships 2011. Tommy Patton Park, Belfast - 18TH June.

For once the weather forecast was good for our competition, with generally favourable flying conditions to last most of the day

With six entered in F2B this was the same as last year, Kevin Barry travelling from Cork with Chris Gilbert and Stu Holland coming from Dublin.

Mitchell Shaw was our judge in both F2B and Classic.

With the weather being so favourable F2B got started as soon as everyone had their practise flight.



John Hamilton, Kevin Barry, Chris Gilbert, Mitchell Shaw, Peter Bradshaw and Stu Holland.

The competition was very close after the first round, with John and Maurice posting scores within two points of each other. The fight for third was equally close with Kevin, Stu and Peter all within nine and half points of each other.

Unfortunately Chris's model came to grief when it hit a large bush just outside the flying circle, this finished his involvement in the competition.



Т h e second round started with John posting the highest score of the day, clinching first place in the competition, with Maurice consolidating second place. Kevin improved his score to take third with Stu in fourth and Peter fifth

Five Desperate Men: Ray Jennings, John Hamilton, John Black
(Judge), Mitchell Shaw (Judge) and Chris Gilbert.Classic
was a single

round competition, again flown in good conditions. Maurice taking the honours, with Kevin in second place and Stu third.

Our thanks for all coming along, especially those who travelled so far to make the day worthwhile, and the judge for his essential contribution.

Flight 1	Flight 2	Total	Placing
970.5	1011	1981.5	1
972.5	959	1931.5	2
907.5	957.5	1865	3
901.5	901.5	1803	4
911	830.5	1741.5	5
922.5			1
883			2
798.5			3
	Flight 1 970.5 972.5 907.5 901.5 911 922.5 883 798.5	Flight 1 Flight 2 970.5 1011 972.5 959 907.5 957.5 901.5 901.5 911 830.5 922.5 883 798.5	Flight 1 Flight 2 Total 970.5 1011 1981.5 972.5 959 1931.5 907.5 957.5 1865 901.5 901.5 1803 911 830.5 1741.5 922.5 883 798.5 95

Peter Bradshaw

The Fokker Triplane.

It is one of the iconic and great fighting aircraft of WW1. It's high rate of clime and turn made it, in the right hands, a formidable foe. What features of its design contributed to its legendary status?



Undoubtedly, its Oberursel rotary 110hp engine, (a copy of the French Le Rhone). contributed to its exceptional turning ability as result of the а gyroscopic effect produced by the engine. The wings, combined with this effect, the absence of landing and flying wires which cause drag, all contributed to its high rate of climb. But what was it about its wings which made it superior to its contemporaries at the front.

Oberursel rotary engine as fitted to the DR1

The aerofoil profiles used on early biplane fighters of WW1 were very thin sections, (4 - 5% thickness), and essentially functioned as flat plates. While these worked at low angles of attack they were incapable of producing the higher lift and low drag produced by thicker sections. How did such misunderstanding and design error occur?

Firstly there was the design influence of bird wings and the thin sections were not unnaturally associated with low profile drag. Regarding early wind tunnel tests, there existed no knowledge of the all important boundary layer airflow and Reynolds Numbers, (RN) related to scale effects. Small scale and 'thick' aerofoil sections tested at low RN. Further, the cause of high drag was not understood - high pressure drag due to boundary layer failure.

The situation was addressed in 1917 by the Gottenberg laboratory of Ludwig Prandtl, when he recognised the importance o the boundary layer airflow. The result was the 13% Gottenberg 298 aerofoil profile.

The 298 was incorporated into the Fokker triplane wing sections, contributing greatly to its exceptional manoeuvrability and rate of climb.



The iconic Fokker DR1 Triplane.

Subsequent Focker designs, the D7 and D8, used the 'thicker' wing to their advantage, and the D7 is generally regarded as probably the best fighting aircraft on the German side in WW1. No doubt the ability of the Fokker D7, 'hang' on its prop, was due tin no small measure to the design of its wings. The little known but highly effective Dornier Zepplin D1 fighter of 1918, with its stressed metal fuselage skinning, cantilever wings of torsion box construction, also employed the 'thick' wing section. Interest in the Dornier Zepplin was high, and two of the D1's were taken to the United States for evaluation.

Eamonn Keenan

Control Line Nationals 7th August, Brinny Co. Cork, Cork Model Aero Club

With the smell of sausages, rashers and pudding in the air the car park began to fill for the Control Line Nats. The pilots briefing was held at 10:00 am in the canteen to avoid the showers, which gave the opportunity to have a bit of a feed. The showers were heavy and the winds were light but there was clear sky behind the dark, so when the shower stopped at 11:00am, Judges Ralph McCarthy, John Molloy and Richard O'Brien took their seats to judge round one of F2B Stunt. Many thanks to both the F2B Stunt and Classic Judges, Peter Bradshaw, Adam Taran and Chris Gilbert for their contribution to the event.

It was commented on the day that the Brinny Flying site boasted excellent facilitates including a permanent bathroom, canteen with full kitchen and a manicured flying surface maintained the club's resident greens-keeper, Matt Quin. The BBQ was fired up early in the afternoon and food was available for the duration of the event. Many of the Cork Model Aero Club's members contributed both on the day and in the preparation leading up to the event for which the club is very grateful.



Group Picture

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Maurice Doyle Flying

Two classes of Control Line, F2B Stunt and Classic were flown with seven and four entry's respectively. The Contest Director on the day was Richard O'Brien and the Line Director was Kevin Barry who ran a tight yet relaxed ship. Pilots travelled from all over the country and from as far away as the Belfast with many travelling from the Dublin area. Three round of F2B Stunt were flown and two rounds of Classic were flown in excellent conditions.

Congratulations to both Adam Taran the winner of F2B Stunt and to the closely separated runners up. Congratulation also to Maurice Doyle the winner of Classic who showed us all a thing or to as usual.



Prize giving, Adam Taran, Richard O'Brien

F2B, Stunt Results				
Pilot	Round 1	Round 2	Round 3	Best 2 of 3
Adam Taran	2632	2977	3055	6032
Maurice Doyle	2862	2878	3018	5896
Peter Bradshaw	2572	2702	2881	5583
Kevin Barry	2726	2853	2716	5579
Stu Holland	2267	2621	2786	5407
Chris. Gilbert	2409	458	2340	4867
Ivan Bolton	1728	1991	2312	4303
	Clas	ssic Results		
Dilat	Dound 1	Dou	nd 2	Total

Pilot	Round 1	Round 2	Total
Maurice Doyle	2941	2842	5783
Kevin Barry	2412	2789	5201
Stu Holland	2215	2400	4615
Ivan Bolton	1756	1984	3740

Richard O'Brien

Am I a modeller or a flyer ?

A lot of members need to ask themselves this question when they are talking to other people about their hobby.

Have you stepped or slid into that category that is known as a "cheque book" modeller" without even knowing it. This is supposed to be a hobby. A hobby that gets you building, covering, soldering, working on engines, wiring up your RC equipment etc. Then comes that day when we take our new baby to the club for it's first flight. Only those who have gone through this process fully understand what I mean. These days I find that people (and I purposely will not call them modellers) are looking for the quick fix, write the cheque, shake the box and so what if I crash it, I'll just get another one. This is the type of model we see 90% of the time at our club field/site. I talk to MACI members every week and during our conversations they tell me what models they have. Most of them would have 5 or 6 ARTF models lying around. These models might have only seen the light of day once or twice a year. What ever happened to fly one and be building the next. If one of them has a bad prang (crash for the new members) and if it did not explode on impact it usually can't be repaired like a model you have built from a kit. All in all these models are a waste of your hard earned cash and you end up as an ARTF victim with empty pockets. Ok, if a new member starting out wants to get in the air quickly and learn to fly, pick one up as a starter pack. It does not have to be a new one. A good second-hand one will do the job but get yourself a kit and start building your second model and enjoy all the benefits of this hobby/sport that is known as the building and flying of radio controlled model aircraft.

In the past we would usually use this scale:

1st model: High wing trainer for a year or so.

2nd & 3rd model: Mid or low wing for another couple of years.

4th model: Warbird, if you are good enough after about 4 years flying. Some people never reach this level but enjoy the hobby all the same.

I have seen club members take ARTF Spitfires out of their cars after only flying 6mths on a trainer aircraft and bringing them home in a black-sack. New members to our sport need to be trained properly and by this I don't only mean in their flying skills. Clubs need to get back to holding meetings outside of the flying site. Let us show our new members what this fantastic hobby is all about. Have them meet and chat with old hands at the game. We can learn a lot over a cup of tea & magazine swap.

Adrian McShane IRL346

Paper Aeroplanes

It will come as no surprise that very many of us will have made and flown paper aeroplanes. Our earliest memories will be of flying them from an upstairs window, flight of stairs, hall or hillside.

I don't remember who first showed me how to fold the sheet of paper, but it was probably in the back row of a classroom, when I was daydreaming arial combat in the skies over the Western front during WWI. Since then I've made many, (paper aeroplanes not daydreams), usually to entertain my children and Grandchildren and allow them to wonder at the transformation from a flat sheet of paper to a flying machine which can emulate the birds.



Recently, browsing a pile of cut price books in a local shop. I unearthed a volume bearing the enticing title - Fold and Fly Paper Planes (50)planes and folding paper). Now I know, I can supplement my two basic designs, and furthermore. impress my grand children, some of whom are just old enough to be

Eamonn with grandsons Adam and Evan plus paper planes.

recruited at some time in the future as modellers.

The beauty of the book is that there are step-by-step instructions for 50 planes, plus the paper, (coloured), to make them.

Now, steady on there, I will give you the publisher at the end of this article; as well as a web-site, both of which will further your career Jim, if you care to take it, as a paper plane tosser!

But first, the author of the book, an American called Dean Mackey, gives some fascinating facts on the history of paper aeroplanes, and notes that the earliest documented designs appeared in America about 1913. None-the-less, reference to them in one form or another, appears as early as 700 AD.

On of the pioneers in America was a fellow by the name of Percy Pierce, and his patented designs appeared in issues of American women's fashion magazines in the 1920's, (that's what he says). The planes were quite striking and fairly complex to assemble. In the 1940's, paper planes became very popular and even featured on cereal boxes. A key designer of the day was one Wallis Rigby, who is credited with creating the 'tab and slot' method of construction. His planes appeared in newspapers, thrilling readers with their realistic detail.

Dean Mackey goes on to highlight 'The Great International Paper Airplane Book' published in 1967, and introduced the concept of laminated paper aeroplanes which were popularised by Dr. Yusaki Ninomiya in his famous and fantastic 'Whitewings' series. Capable of greater speeds, heights and variety of shapes, some of the models when launched by rubber bands, (and the right weather conditions prevailing), could catch a thermal current.

Paper Aeroplane Competitions

The first international paper aeroplane competition was held in 1967, sponsored and conducted by Scientific American. The competition brought together various styles and forms of paper aeroplanes from all over the world which were later published in 'The Great International Paper Airplane Book'. In 1985 the second international contest was held and reflected all the latest advances and designs.

The World Record

Takuo Toda from Japan is the current title holder of the Guinness World Record for time aloft of a paper aeroplane. He set the record in 2009 with a time of 27.9 seconds. The previous world record was 27.6 and had stood for 10 years.

As promised, the publisher of the 'Fold and Fly Paper Planes' is 'Hinkler Books Pty. Ltd.' Australia - www.hinklerbooks.com. Dean Mackey has an online site featuring over 800 free paper aeroplane designs, reviews of paper aeroplane books and many other related items.

Visit the online Paper Aeroplane Museum at theonlinepaperairplanemuseum.com Dean Mackey can be contacted at deanmackey@gmail.com

Could this be the way tgo, now that it's nearly impossible to fly anything outdoors, what with the wind and rain etc!

Eamonn Keenan





2011 MACI Annual General Meeting.

Saturday November 26th

At the Killeshin Hotel, Portlaoise

Starting at 2:00pm sharp

There will be a dinner to follow at approx. 18:30

All members are welcome. Please make every effort to have a representative of your club in attendance.





Proposals for Changes to the MACI Constitution

1.

<u>Amend Article 32</u> by replacing the last sentence currently reading "Any member present may hold one proxy, in writing; from another member provided that member is not himself present." with the following new sentence:

"Voting by proxy is not permitted."

Proposed by Finbar Constant (IRL 569), Seconded by Kevin Barry (IRL87)

Comment

The purpose of this proposal is to improve operation of the annual general meeting and to prevent the possibility of a small group collecting proxies in order to double their voting power. In practice proxy voting has not been used by members who have a serious interest but cannot attend an AGM.

2.

<u>Amend By-law on Flying Sites</u> by replacing the word "eight" in the definition of "A. club flying sites with "six".

Proposed by Finbar Constant (IRL 569), Seconded by Chris Clarke (IRL3304)

Comment

This proposal tidies up an anomaly between two MACI rules – the minimum membership size of an affiliated club which is 6 and the number of people using a flying site to make it require a club registration which currently us 8. Bringing them to the lower number is an effort to help clubs with smaller numbers survive. As this is a by-law change the Council have the right to make the change. However traditionally AGM's often vote on by-law changes which the council normally ratify.

Handling Taildraggers

Most pilots are taught to fly in nosewheel aeroplanes, because they are the easiest to taxi, take off and land. But a pilot who can only fly nosewheel is going to be very restricted, for the aircraft with the most character, the nicest controls, the oldest and the most economical, are nearly all taildraggers. Moth, Jodel, Pitts Special, Piper Cub, Sukhoi and Spitfire... all have the third wheel (or skid) at the back.

I've been flying taildraggers for most of my adult life, I've owned several, and I've flown at least a couple of dozen different types. Recently, I've been training nosewheel pilots to land a Stampe. To prepare for this article I also consulted a range of experts, including the instructors at Clacton, where they



Nosewheel - centre of gravity in front of main wheels.

use Super Cubs to train non-pilots up to PPL. I spoke to Alan Cassidy, who instructs in a Pitts S-2A, Francis Donaldson at the PFA, and various members of the Tiger Club, where they fly Stampes, Jodels, Turbulents and Tiger Moths.

What are the effects of this, to many modern pilots, bizarre and unnecessary undercarriage arrangement?



Taildragger - centre of gravity behind the main wheels.

Well, for one thing, the aeroplane becomes harder to steer on the ground. This is because the centre of gravity is behind the main wheels, which makes the aircraft unstable; a yaw to left or right will automatically become progressively worse, unless corrected. This is what causes groundloops, a characteristic of taildraggers in which they suddenly behave like puppies

playing at biting their own tails.

The tailwheel configuration Is more vulner-able to crosswinds, particularly on hard surfaces, and even more so if the surfaces are wet.

Some taildraggers with long, stalky undercarriages have a sit up and beg position on the ground, in which the engine blocks the pilot's view forwards. This makes steering, already difficult, even harder. It also makes for complications in the transition to and from the flying attitude. Finally, in a taildragger there is nothing to stop the hapless pilot putting the aeroplane on its nose, presumably why so many Edwardian types were fitted with ultra long protec-tive skids shaped like the horns of Steers those lovely hand-carved walnut propellers must have been expensive to replace.



Weaving to see past the nose, essential in a Yakovlev UT-1

You may ask, why have taildraggers at all? Nose-wheels have been fitted to aeroplanes since before WWI, so placing the third wheel at the front is not exactly a recent discovery.

For one thing, nosewheels add drag, reducing cruise efficiency. They take a lot of punishment, so they have to be built strong. This adds weight, complexity and cost. They seem to be in constant need of maintenance and repair - ask any flying school. Lastly, they are less efficient on poor terrain and require longer and smoother runways. You *can* have short take-off and landing performance with a nosewheel, but you will have to pay for it in other ways - a more powerful engine, flaps and slots to improve wing efficiency at low speeds, which in turn means adding more weight and more complications. You end up with a slow, heavy aeroplane. (Think of the Rallye, excellent in its way I am sure, but not the world's greatest performer.)



A competent nosewheel pilot could handle an Evans VP1

The tailwheel arrangement is simpler and more versatile. If it also makes aeroplanes a little more challenging to pilot, perhaps that is no bad thing.

Taildraggers vary enormously. Some (like the Evans VP1) are so easy that a competent nose-wheel pilot could handle them without any training. Others are so difficult that even an experienced taildragger pilot will need several hours of instruction.



The Turbulent has the potential to tip on its nose due to the wheels being mounted near the c of g

Generally speaking, the easy ones have a steerable tailwheel linked to the rudder with springs. If the gearing between rudder and wheel is properly set up, the pedals will steer the aeroplane equally effectively at all speeds and regardless of throttle setting. On some of the challenging more taildraggers, like a Tiger Moth, at low speeds you need to co-ordinate blasts of air from the propeller

with rudder and forward stick to steer at all. The Tiger moreover has no brakes, so you quickly run out of options in a confined space. This is good in a way - it encourages you to think ahead when taxying.

It is less difficult if the aeroplane sits on the ground in a flat attitude and the pilot has an unobstructed view to the front. When taxying in some aerobatic types (like the Extra 300) you have to turn through as much as 45 degrees in order to peer round the nose to see where you're going, whereas the view from the front seat of a Super Cub is similar to that from a modern car.

The main wheels should be set wide apart, to give the aeroplane lateral stability. (One reason RAF instructors so favoured the old Avro 504 was its narrow undercarriage, which showed up any drift on touchdown by dipping a wing.) In low-wing aeroplanes, a wide undercarriage is usually achieved by mount-ing each leg independently to the wing spar. There's a problem with this, as a few Jodel pilots have discovered over the years: the legs are vulnerable to sideways loads. Land with drift on and the legs can be wiped off.

The suspension should be well damped, reacting to landing loads like a partially deflated football, tending to kill bounces rather than exaggerate them. Unfortunately one of the simplest arrangements for undercarriages, using giant rubber bands called bungees, is one of the worst in this respect. The otherwise superlative and certainly charming Piper J-3 Cub has bungees, and if you bounce one, it will probably continue to bounce all the way down the field. Instructors, who some-times seem a little sadistic, actually claim to like this trait, presumably because it forces students to get it right.

The main wheels should not be placed too far in front of the centre of gravity (as in Austers), because this exacerbates ground-loops. It also takes forever to get the tail up, prolonging the take-off run and increasing the likelihood of hitting something because you can't see over the nose. Nor should the wheels be mounted too far back and close to the centre of gravity (as in Turbulents), because this puts the aeroplane in peril of tipping onto its propeller.

Brakes should not be too effective, for the same reason. I found this out once, braking too hard when taxying a Pitts with rather tight spats and bulging, under-inflated tyres. The Pitts tipped onto its nose. It is most unpleasant to find yourself suddenly several yards up in the air, wooden chips flying round your ears and wondering if the aeroplane is going to stop where it is or go all the way onto its back.

Some taildraggers, like the Turbulent and the Stampe, have independent brakes that operate automatically at full rudder but cannot be used together. As well as protecting the propeller, this makes steering easier because it gives you



extra pedal power at f u l l extension.

The stall speed should not be so low that the slightest breeze becomes a problem. You don't want а high landing speed either.

Too much forward stick on a Jungman compresses the oleos, making it almost un-steerable.

because when landing a taildragger you need plenty of time to think. There is also the excess energy problem.

To quote Alan Cassidy, "My Pitts touches down at about seventy mph. Kinetic energy is a function of mass and *square* of speed, so a Pitts has vastly more to dissipate than, say, a Cub."

Some taildraggers lose aileron power at slow speeds and high angles of attack i.e. in the later stages of a landing. The Tiger Moth, Auster and Kitfox all suffer in this respect and it adds considerably to the challenge of get-ting them on the ground in one piece. Worst of all are the types where a drooped aileron to lift a dropped wing stalls the wing altogether, so that a wingtip hits the dirt. This is a characteristic of Edwardian aeroplanes and some American inter-war biplanes and high-wing cabin monoplanes, and you get round it by ignoring aileron and using rudder alone when in low-and-slow mode.



Finally, aeroplane the should have a low centre of gravity to enhance lateral stability. Biplanes, especially those that carry fuel in the top wing, have a high C of G, and are more prone to lifting a wing for this reason, although experts can exploit this their to

advantage.

There

With little prop clearance, the Sukhoi SU-26 must take off and land on all three points

is a technique for handling crosswinds in a Tiger Moth by curving the final yards of the landing run away from the crosswind. Centrifugal force from the weight of the top wing keeps the into-wind wings from lifting.

What does a nosewheel pilot need to learn in order to master the taildragger? Let's begin with taxying.

A taildragger can tip onto its nose if you brake hard, and not only if you brake; a shal-low ditch or a rabbit hole can do it. So, as a rule, you should taxi no faster than a brisk walking pace. You should also weave from side to side if it's an aeroplane with an obstructed forward view.

Hold the stick back, so that the propeller blast on the elevator keeps the tail firmly grounded. However, if you should be taxying with the wind behind you, a gust might get under the raised elevator and lift the tail. With a strong wind from behind, the elevator should be neutral.

Most authorities advise that, taxying cross-wind, you should move the stick fully in the direction the wind is coming from. I have my doubts. I can't believe that a four-to-ten mile an hour movement forwards will provide enough airflow over the aileron to stop the into-wind wing lifting. I still cant the stick over, in case the authorities know something I don't.

While you are taxying, you will discover that you have to steer all the time. A nose-wheel aeroplane will continue in a straight line until told to do otherwise, but a taildrag-ger will wander off course at the least excuse, and once it does, the turn will develop unless corrected. Steering takes a lot of practice until you are used to it.

A few taildraggers have a fully castoring tailwheel to aid taxying that needs to be locked in the fore-and-aft position before tak-ing off or landing, usually by moving a lever in the cockpit.

Take-off

Lined up, you are ready to take off, so you smoothly open up to full throttle. If the aeroplane has toe or heel brakes, be extra careful to keep your feet off them!

What you do next depends on what taildragger you are flying. In most, you push the stick fully forwards, right to the stop, in order to get the tail off the ground as early as possi-ble.

In a Pitts Special the tail lifts immediately. In a tail-heavy design like the

Skybolt, it might take a hundred yards to lift. Most taildraggers need to gather speed before the tail comes up.

When it does, you have to stop it getting too high, or you'll ground the propeller. You do this by return-ing the stick to neutral.



Protective nose skid on an Avro 504K

Try not to grip the stick. The correct state of mind is important; you should be relaxed, yet concentrated and alert.

Alan Cassidy again: 'The thing with taildraggers, as against nosewheel aeroplanes, is that you have to fly more accurately. You can land a Warrior any old how, from wheel-barrow to mains-and-tail-bumper and the aeroplane will sort itself out, but in a tailwheel aeroplane you do need to be more precise. It's a challenge, but has great rewards, when perfected."

We left you skimming along just above the ground, steadily losing speed. As I say, don't think about landing, just about flying as near to the ground as possible without actually touching it. Of course, with the throttle at such a low setting, gravity is bound to win eventually. When you feel the tyres making contact, you are into the final phase of the landing.

Almost certainly, you will have touched down prematurely, in which case the aero-plane will bounce. If it rebounds lustily Into the air, abandon the landing; open the throttle, make a circuit and try again. If the bounce is not a severe one, Ignore it and keep up the attempt to fly just above the ground. What is likely to happen is a succession of increasingly smaller bounces ending with the wheels firmly grounded.

Now, close the throttle completely and transfer all your concentration to keeping straight. As the aeroplane slows down, you will find that steering gets more difficult. You will need larger and firmer foot movements to maintain a straight line.

The danger point is when the aeroplane slows down to about ten or fifteen miles an hour. It is easy to relax and react too slowly to an unexpected swing. At this speed, a groundloop is likely to do damage. Once the aeroplane has slowed down to a fast walk, a groundloop will just be embarrassing. In fact, a deliberate groundloop is a good way to stop a taildragger in an emergency when the alternative is hitting the far hedge. I had to do this once in a Stampe, landing in a field no bigger than a football pitch after the engine had stopped. One wheel lifted, but not so high as to ground a wing tip, and the aeroplane was undamaged.

Crosswind landings

Suppose there is a crosswind. In a fairly bulky aeroplane like a Stampe, I would advise approaching with the wings level and the slip ball centred. Point the nose into the crosswind by however many degrees it takes to maintain a track in line with the runway.

This will bring you over the runway with the nose pointing off to one side.

When you think the aeroplane is ready to touch down, use rudder to kick it straight.

From the moment you do, the crosswind will theoretically make the aircraft drift sideways, eventually taking it off the runway alto-gether. However, unless the wind is very strong, in practice most aeroplanes have enough momentum to keep them on course for several seconds after being ruddered straight, should you do this too early.

What happens if the wheels touch before you have had a chance to line up the nose with the runway? This does put a sideways load on the undercarriage, which in а few aeroplanes can lead to trouble. Aeroplanes like the Isaacs Fury, with a narrow undercar-riage and long wheelbase, hate this, as do aircraft with legs mounted on the wing spar rather than the fuselage.



In a crosswind, two different methods of approach can be used. The 'yawed' approach, top, and the 'wing down' approach, bottom.

Taildraggers are generally much less tolerant of landing with drift than nosewheel aeroplanes, but a Stampe or a Super Cub is likely to be forgiving unless you get it badly wrong. Land one crooked or with sideways momentum and it will straighten up by itself. Students do this all the time, and have no idea why the arrival was so untidy until told. It seems to require a lot of landing practice to develop drift awareness.

The alternative method for dealing with crosswinds is to come in with one wing low, banked towards the crosswind. This avoids problems with drift on touchdown, but creates new difficulties. In many aircraft a lot of bank is needed to offset even a moderate cross-wind. The aeroplane arrives one wheel first, which induces yaw at the moment of touch-down. Unless the suspension is well damped, the wheel can bounce, introducing roll in the worst possible direction, out of wind. All this gives the student a lot to cope with, at the worst possible moment. On the other hand, the yawed approach enables the pilot to see past the nose. For once, the runway will be visible throughout the approach. Landings with a little crosswind can actually be easier!

Many taildraggers are simple machines with no flaps. Flaps improve the view on final approach because they allow you to slow down without raising the nose. There is an alternative, though, which is to side-slip the aeroplane.

To introduce a side-slip, apply rudder to one side, opposite aileron and back stick. You need the back stick to keep to approach speed. Without it, the crossed rudder and aileron will cause the aeroplane to drop its nose and accelerate.

The aeroplane's nose will be offset to the side, but its track will be lined up with the run-way. With the nose out of the way, the view will be greatly improved.

Side-slipping increases the rate of descent, which can, however still be adjusted with throttle. A moderate side-slip will help you to see during the approach without generating much sink, but a hard side-slip can easily double the descent rate.

If you find you are high on approach, you can either reduce throttle, or initiate a side-slip, or both. (There are two additional tech-niques for dealing with this: S-turning and fishtailing, but these can be hazardous because of the risk of stalling and spinning in, and are for the more experienced.)

The maximum rate of descent in a straight line is reached when either the rudder pedals or ailerons are fully deflected.

A refinement of the side-slip is to combine it with a curved approach from downwind to final. While the aeroplane is turning, some of the lift from the wings is being diverted into centrifugal force, so the descent rate is even greater. This technique is often used in aero-planes where the pilot has an exceptionally poor view, such as the Pitts Special, Extra and Spitfire.

To come out of a side-slip, simply centre rudder and aileron. Beware of leaving it too late and side-slipping into the ground. It does happen.

Main wheel v three-point

You will hear pilots talk about *wheel landings* as distinct from *three-point landings* where the aim is to keep flying until the last moment. The former involves touching down on the main wheels only, and keeping the tail up for as long as possible; the latter means touching down simultaneously on all three wheels.

The procedure for a wheel landing is to level off at an altitude of a few inches while still at flying speed. A slight forward movement of the stick will touch the mainwheels, and an additional urge forwards will hold them on the ground. The stick deflection should be slight.

As the aeroplane slows down. continue to advance the stick in order to keep the tail up in a level flying attitude. Eventually and by now the aircraft will have slowed down considerably the stick



Getting it wrong - this bounce followed a misjudged hold-off and stall. The pilot was unable to fly out of his predicament or even cushion the subsequent, and much heavier, arrival.

will reach the forward stop and the tail will begin to sink. By the time the tail drops to the ground, the aeroplane may be at no more than a fast walking speed.

If you wish, you can prevent the tail from dropping at all by progressively opening the throttle. Tail-high taxying is great fun once you've got the hang of it but, like hedge-hopping and low aerobatics, it's asking for trouble if you make it a habit.

Main wheel landings are mandatory for a few older taildraggers, generally because air-flow from the wings or fuselage blanks off the tail surfaces once they are lowered.

In some types, main wheel landings are recommended for crosswinds. The Stampe, for instance, has a rear wheel that is free to turn in any direction. Dropping the tail of a Stampe partially masks the rudder and gives no steering advantage from the rear wheel. If, on the other hand, your taildragger has a tailwheel or skid linked to the rudder, dropping the rear gives added steering power to overcome a crosswind, so a three-point landing may be the best way to cope.

It is advisable with manv taildraggers to compromise and land mainwheels first in something approaching a three-point attitude. The Turbulent, for instance, is set up to stall at the moment of landing. This is fine if you only have an inch or two to fall, but very awk-ward if you misjudged things and are a cou-ple of feet up.

Main wheel landings can also be useful when landing on obstructed terrain. Let's say bad weather or engine failure is forcing you to land in an unfamiliar field. There may be obstacles that you can't see



failure is forcing you to land in an unfamiliar field. There may be obstacles that you can't see *from the rudder controls, to help[low-speed ground handling.*

from the air. Because you want to be sure of getting into the field, you will probably come in fast. A main wheel landing can be made, if necessary, at a speed well above the normal landing speed, although the tail will need to be high in order to keep the wheels grounded. So you touch down early and tail-high, braking gently (or furiously, side-to-side if the field is short) to slow down without tipping onto the nose. Forward visibility will be much better than if you had held off for a three-point landing. You will be able to steer round obstacles, but a taildragger is very unstable in this configuration, and turns of more than five or ten degrees will be risky.

Three-point landings are more elegant and because the aeroplane is at its slowest speed when it finally touches down, they save wear and tear on the undercarriage. A three-point landing is the safest way to touch down when forced -landing in very high grass or standing crop, because there is less likelihood of the aeroplane going on its nose. The disadvantage is that, in the final stages of the landing, the pilot is likely to be virtually blind.

Skids

Few taildraggers these days have a tailskid rather than a wheel at the rear. The most common is the Tiger Moth, which actually has a steerable one, linked to the rudder. Originally, tailskids were used as a means of braking. A typical 1914-1918 arrangement involved a wooden spike that left tracks in the turf when taxying. Moving your stick back dug the tailskid in and slowed the aeroplane, and you gave forwards stick to lift the tail if you wanted to turn.

The skids were made of hickory or some other hard wood, metal capped, and hinged in the middle with bungee springing at the front. Later aeroplanes had a simpler arrangement, a leaf spring with a lump of iron on the end to spread the load and keep the turf smooth. Some Turbulents had skids like that and the arrangement was robust and practical.

Tailwheels, while cheaper and easier to maintain than nosewheels, do give trouble occasionally. The leaf springs attaching them to the fuselage, and the coil

springs connecting them to the rudder are prone to breaking. The ball race axle bearings get water into them and rust; best to replace them with sealed bearings if you can.

The tailwheel assembly on the Stampe is a very complex piece of engineering, which says a lot about the wear and tear expected on a training biplane's rear undercarriage.



and tear expected on a *Older Biplanes used a tailskid, both for directional control* training biplane's rear *and braking action.*

Tailskids are simpler, but they wear down remarkably quickly when taxying across tarmac or concrete.

Mastering the taildragger certainly is enjoyable. It forces you to really think about your flying. And once you've landed one, you will have opened the door to some of the best and most rewarding aviation.

Original article by Nick Bloom

Tom's Silver Jubilee Celebration MACI Aer Rianta Power Trophy 1951

Many MACI members will have seen the magnificent Aer Rianta Power Trophy (recently being awarded for the Nationals Radio Control Scale), which is a replica DC3, about 18 inches span, steel, on a massive plinth with the winners' names on rows of plaques around it. Tom McClelland of Belfast MFC has the best memory of it of anyone, as he was the first to win it, when he won the Free Flight Power at Baldonnell Aerodrome in 1951. Sixty years on, he recalls that it was awarded at the MACI AGM by the Chairman of Aer Rianta, and moreover, he was awarded a replica, photo above, which he still has. He has made a magnificent gesture by presenting the replica to Belfast MFC to hold in perpetuity, a very much appreciated memento of a very special day for the Club.

Т h e inscription on the "Aer replica is Rianta Power Trophy, Т McClelland, Belfast MFC, 11th Irish Nationals 1951". This means that the first Irish Nationals was held in 1940, and in those early years, the presentations were made by the Taoiseach, Eamon DeValera, showing the



Tom McClelland of Belfast MFC with the Trophy.

recognition of Model Flying in those days. From 1945 to 1950, the SMAE (Society of Model Aeronautical Engineers) sent teams from England to fly in the Irish Nationals, and they naturally provided most of the winners in the Free Flight Power and Wakefield (Rubber powered) events, names like Bill Dean, Ron Warring and Norman Marcus. Tom was therefore possibly the first to win this top event from this side of the water.

At the AGM Tom met Jimmy Tangney, who was in the US Navy, and had come top in the Team Trials for the British Wakefield Team, but could not fly as he was American. Des Woods, who is mentioned later, said the English fliers came over "Because they had never seen a steak in their lives!". Tom recalls many details of the event and flying at that time. His winning model was a Banshee, an American design by Leon Shulman, still available as a plan for Vintage enthusiasts, and powered by an Elfin 1.8, a very powerful motor at that time. He also built and flew a Slicker 42, powered by a Mills 1.3, and other Kiel Kraft designs, the Bandit by Bill Dean, the Competitor and Ajax. He remembers flying at Baldonnell, and also at Weston Aerodrome, and several sites around Belfast. One was near the Railway Station at Finaghy, and also the flying site at Hannastown, high up on moorland behind Divis Mountain. It is still there, now owned by the National Trust, who are inviting the public to come and enjoy the wide open space.

Fliers from Dublin he recalls were Des Woods, Doc Charles, Billy Brazier, who had a Model Shop, and Johnny Carroll. Local names were a Father and Son called Croft, who flew Comets at Malone Aerodrome, now a Housing Estate, JJ Hanley, CWA Scott, who had a Flying Circus in the Thirties, and a pilot called Macintosh, who was naturally called "All Weather Mac". Other names are Frank McDonnell, who flew a KK Outlaw, Sammy Young, who flew a Comet powered by an Ohlsson 61, Wally McCormick, who had a Low CLA design published in Aeromodeller, Howard Menary, Bill Tinnion, Bunny Boyce, John Rankin, Robert Gardiner and Wilbur Little, who owned ATO Model Crafts in Belfast. ATO was All Types Of, and Wilbur found balsa from Carling Floats and succeeded in making a series of ATO kits in the time just after the War when everything was scarce.

Tom remembers that about 1950 the Belfast Club ran an Exhibition in the Wellington Hall in the YMCA, Wellington Place, Belfast, and it was a well supported and successful enterprise. Claude Austin, (later to be lost in a yachting accident) of Austin's of Derry (a major Department Store, still prospering in Londonderry today) was flying Control Line models, causing quite a stink in the confines of the hall. Norman Osborne, a great F/F modeller of the era, still going today, and in contact through Howard Stephenson, was flying microfilm free flight indoor models and was not happy with the air disturbance caused by the C/L activity.

Tom is now flying with Ulster Model Aircraft Club at Nutt's Corner and enjoying more sedate models than the screaming Banshee. He is a very modest and unassuming man, but enjoyed casting his mind back to the events of 60 years ago. Belfast Model Flying Club is very honoured to be presented with this valuable record of an event of note in the Club's history.

Maurice Doyle

Hints & Tips







BALANCING ACT

Make this balancing jig out of lumber you have around. The ¼-inch (6mm) threaded rod, washers and wing nuts are probably all that you'll need to buy! Part (a) is 1/4x/4x15 inches (32x20x381mm); the base is of the same material. Glue and screw the parts together before you glue short ¼-inch (6mm) dowel rollers (b) to the top. The rods (c) are ¼-is adjustable and "B" is the distance from the leading edge to the CG—the rods automatically align the wing correctly on the dowels. You might need to enlarge the jig for big models. To ensure alignment, glue one long dowel to the top, then cut out the center.

Thanks to Eamonn Keenan

Junkers JU87-Stuka

Photo of a JU87 I built over the last couple of months. I built it from plans, and as usual the plans that are out there for Stuka's are, in my opinion, rubbish. \what you end up with is a Stuka/Typhoon.

A serious project would require a prop-shaft extension to get the engine right back to the firewall so that the chin radiator would be in the right place, not just behind the prop i.e. Typhoon.



Kevin Wilson IRL 1359



"There are many ways to balance your aircraft, but not many do it the same way that Paddy Gavin does!"



