Airscrew

Facts, opinions, pictures and fun

https://northreppsmfc.com/ *January 2020 and 2030*

To contact me send an email to peter@northreppsmfc.com

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Chairman's end of 2019 message

I have to say it was with some trepidation that I made my way to the A.G.M. this year. With all the hoohah that has hit our hobby I wasn't sure what to expect to be honest. In efforts to keep you appraised I had laid it out quite thickly from my perspective over the last twelve months and like a lot of others around the Country I had kicked and screamed and resisted the attack on our hobby as much as I could for as long as I could. In the process I know I have upset several who in their own minds I am sure feel they are in higher places than the rest of us mere mortals ;) I make no apologies, it goes with the job, I have worked within Government guides and constraints most of my life and I do not trust very many of those in Office, but that is my cross to bear, we need to move on with the next phase of our fight, keeping as many models in the air as often as we can for as long as we can. We need to show them they will not stop us enjoying our hobby. To one and all I will say get everyone you know into the hobby, now is the time to try to get the hobby to grow exponentially and flood the skies with models. He he he, nice idea.

As is my want, I will always try to be early rather than late to an appointment. Sunday was no exception, it was a good job as I had to return home. Yes I forgot the main component, my computer, which I have to say I am lost without these days. Funny how you adjust to things. Apologies to Dave Fines for taking the michael when you forget something :) but I will probably carry on. I have to say my trepidation turned to relief as more and more of you trickled through the door and took your seats. Phew - We Will Survive as the song goes. We had approximately two thirds of the membership turn out for which I will be eternally grateful to you all.

I think we had a good meeting. Out of necessity it took the same format as these things always do. From a Club perspective we are moving along nicely. Our end of the field is looking good. I hope it is due to this condition that we have had a few full size use our runway for take-off and for landing again. If it is down to their eyes and comprehension of field layout - we are in biggg trouble folks. :)

Awards were presented for the competition winners and the two closest chasers. Sadly some had left before we were able to get any pictures. The highlight I think was young Ciaran. In his first year he showed everyone how the Climb and Glide should be done. Well done Ciaran.

Our trusted old caravan is getting towards the end of its life. If anyone has or comes across something suitable for replacement let us know. In the meantime we will treat her gently and try to persuade her to last another year or so. Peter has done a good job with his mastic gun and is keeping her sealed for now. Sounds like a snippet from an 'x-rater' doesn't it? :):):)

As a fairly last minute idea we had a mini auction type event to round out the meeting. Members donated items to the Club and we auctioned them to assist Club funds. We managed to get about ten items to give it a go. It was a little hit and miss but we managed to raise £85. I think all that made a purchase had a really good bargain. If we do it again we will have more warning and can stock pile some items through the year. So when you have your next clear-out bear us in mind please.

There are continuous updates being made to the website throughout the year. Check regularly to ensure you get the most from the available resources. Make use of the 'Flying Today' chat box to openly chat with fellow members, a very useful feature.

Come on then, hands up, who sang We will survive and who still is? :) See you at the field folks. Keep 'em flying'

Competition results 2019

Well done to all competitors and a special well done to the winners. We had a lot of fun and everyone improved their flying. Here are the results for 2019.

Climb and glide		Spot landing	
First	Ciaran Clayton	First	Mark Jordan
Second	Mike Whiting	Second	Peter Scott
Third	Dave Wilcox	Third	Mike Whiting

Climb and glide handicap

Winner	Mark Stuckey

Don’t forget that I welcome suggestions for new one-day competitions. They need to be the kind that most club members would be able and willing to try. That rules out aerobatics and combat but I am sure you can come up with some great ideas.

Well deserved winners

Ciaran Clayton

Mark Stuckey

Picture of Mark Jordan later when we can catch him.

Climb and Glide handicap competition 2020

Handicap competitions exist in many sports. The aim is to make allowance for the fact that some people have been doing the sport for longer than others and are the most likely to win competitions. Even though they are improving, newer members will be unlikely to win and might be discouraged. For us the handicap competition rewards improvement, regularly competing in the competition and gliding onto the runway.

The rules are:
1 There is no additional flying for this competition, just an extra score from the normal Climb and Glide competition.
2 At the end of the previous year each competitor will have achieved a total points score in the normal Climb and Glide competition, for example 135.
3 In the handicap competition, the competitor will then be given this as a negative score at the start of the new year, in this case -135.
4 Competitors will be given points for placing in each round as follows: first 20, second 10, third 5, fourth 4, fifth 3, sixth 2, seventh 1. These points will be added to the negative score. For example if the above competitor scores a total of 165 during the year he or she finishes with score of 30.
5 The three winners will be those with the top three scores, which might be positive or the least negative.
6 To join the competition entrants must have flown in at least half of the previous year’s rounds.

Welcome 2020

The Chinese assign each year a symbolic animal. The current year (2019/20) is the year of the pig.

In view of the promises made to us recently I propose that our 2020 should be the year of the Flying Pig.

Incidentally 2020/21 is the year of the rat for the Chinese.

Newsletter January 2030: The con trick

‘Bandit 3 o’clock. Scramble!’, called the Chief (Con Head In Electronic Flight). She looked up from the screen as the club members jumped into action.

‘E.T.A.?’

‘E.T.A. two minutes. It’s at 100 metres about a kilometre away. Travelling at 30 kph and heading straight for us.’ The members knew they had time to get everyone airborne before the bandit arrived.

It was a bit of a pain taking your turn as Chief rather than flying. But then there was the fun as well. Waiting till someone had lost sight of his or her model in sudden mist or low cloud - that was always good. You sound the klaxon then wait for the pilot to come over and grovel.

‘Do a slow one-eighty so I can track you’, you would shout. ‘You are now at 120 metres due north, coming towards us and sinking at two metres per second. Flying level upright.’ And then there was the joyous walk to the clubhouse for the punishment round of bacon butties the pilot was obliged to buy once safely back. This procedure replaced the ‘O bother’ auto-return button that was briefly popular when auto flying started, though no-one said ‘bother’. Auto flying was now scorned of course.

‘What’s the drone type?’

‘Model T, Orinoco Inc’. Everyone called it a flivver, though no-one knew why.

‘Flight time?’

‘Fifteen minutes elapsed.’ That meant it had about twenty five minutes flight time left. Perfect!

When ‘con’, short for that revolting EU word ‘conspicuity’, first appeared on the scene they had thought that it was the beginning of the end of free model flying. Then the cyclists in the club explained how riding in front of autonomous cars allowed them to slow the cars down to a safe speed on narrow roads. The penny dropped.

It was amazing what the con screens could tell you. Every flying thing in the area showed up on the screen with its identity. You could move to avoid even a daft full-size pilot. But the real fun was rogue drones.

‘Five hundred metres and closing’.

Seven models were now in the air and about to start what was called the ‘Orinoco formation’ or more briefly the ‘con trick’. It was much more difficult and fun than the mock dogfights that sometimes ended with one model dropping onto another and at best both spiralling slowly down.

The con trick involved one model flying above and another below the bandit. Then the remaining models would circle round it anticlockwise. The bandit’s onboard guidance would prevent it moving onto a proximity path so it would stop dead in the air.

It was poetry in motion. The club competitions had improved everyone’s flying. A few years ago flying in a perfect circle in formation would have been beyond many pilots. Now it was like a school of fish. Top and bottom were the tricky stations. Full flap into wind. As the drone slows throttle back almost to a hover then gently enter a tight circle, maintaining height.

Competitions had started with combat where beams and sensors were used to record hits. Once maps were added to the screens they invented a kind of figure skating where models had to be flown to trace exact shapes horizontally. You started with perfect circles and moved on to combinations of eights, squares and triangles. You could see the shape recorded on the screen. At first it was all done using first person view. No-one needed that any more now.

Two green lights appeared in the sky. A cheer went up and the models turned towards it. Top and bottom took station first to make sure the bandit had to maintain height. Then the other models started to circle. Hearts swelled with pride as the drone stopped almost overhead.

‘Count-down please.’

‘Estimated flight time remaining twenty-two minutes.’ That meant they had to keep it still for another eight minutes to be sure. Good job they were now using solid-state and sulphur batteries. They could easily stay up that long.

The call went out from the Chief, ‘Eight minutes needed.’

The eight minutes passed quickly, then the Chief shouted ‘Release!’

Top broke away first allowing the flivver to rise and fly away to deliver the vile plastic toy that it no doubt carried. Everyone knew that it now couldn’t get back to base so would have to land after delivery in one of the safe spots it would know. Then the operator would have to drive out to collect it, always assuming no-one had pinched it. Deep joy.

There was intense pleasure in the skill needed to fly the con trick. It was no use the operator complaining to the club. The flivver should not fly over airfields but of course the operators did as they pleased. Never mind anyone else, nor paying taxes. So all in all it was a very pleasing interlude in the day’s flying. Time for a coffee and a cinnamon waffle. Or three.

Federal Aviation Administration (FAA) squit

Remote identification for unmanned aircraft systems (UAS) as proposed by the US FAA

Don't panic Mr Mainwaring! Don't panic! The FAA has just published a verbose and lengthy load of old squit about what they are trying to force through for the over one million **Americans** who fly model aircraft. If you are in a masochistic mood you can download the full document from https://federalregister.gov/d/2019-28100

I have ploughed through it for relevant stuff and extracted bits together with my commentary which is below. To read my full document go to the News Blog page on our website. Here is my commentary.

My commentary

Note that this will apply to the United States but I imagine that the EU and the CAA will implement something similar or identical.

Key points

- All UASs will be expected to carry identification equipment, either transmitting to the internet and directly to a system set up by the FAA, or to the internet alone. The latter will only be allowed to fly up to 400 feet from the start point.
- Some model aircraft without identification equipment will be allowed to fly but only in defined areas called 'recognized identification areas'. These areas will be defined once and for all and new ones will not then be permitted.
- The FAA expects that unidentified model flying will decline over time.
- Each aircraft will have to be separately registered and possibly a fee be paid for each.

And this is what identification might be like:

DJI makes app to identify drones and find pilots

Dave Lee North America technology reporter
BBC News 14 November 2019

Drone maker DJI has demonstrated a way to quickly identify a nearby drone, and pinpoint the location of its pilot, via a smartphone.The technique makes use of a protocol called "Wi-Fi Aware", with which the drone essentially broadcasts information about itself. The company said it would help prevent security threats and disruption, and give members of the public peace of mind.
But experts believe sophisticated criminals would still be able to circumvent detection. "It's going to be very useful against rogue drones," said Elrike Franke, a policy fellow at the European Council on Foreign Relations, who studies the impacts of the drone industry. "But it's not going to be enough to fight people with real bad intentions, because these are going to be the first people to hack this system."
DJI told the BBC it could add the functionality to drones already on the market via a software update. The firm explained: "Using a simple app, anyone within radio range of the drone can receive that signal and learn the location, altitude, speed and direction of the drone, as well as an identification number for the drone and the location of the pilot." However, a spokesman said that will only happen once pending regulation regarding remote identification of

drones has been agreed upon. He added that DJI has not yet decided whether it will force its customers to install the update.

‘Right behind that building’

While the majority of drone operators act properly, there have been a number of high-profile instances of pilots behaving illegally - and others where suspicion of drone activity has caused huge disruption. In December 2018, Gatwick Airport, in Sussex, England, was brought to a standstill after reports of a drone apparently flying in protected airspace.

“If Gatwick staff had a smartphone enabled with this capability in their pockets,” explained Adam Lisberg, from DJI, "they could have taken it out, seen a registration number for the drone, seen the flight path, and the location of the operator. “They could look on the map and say: ‘Right behind that building.’” Mr Lisberg said the same method could be used to help build trust. One scenario, he suggested, might be a member of the public using an app to discover a nearby drone was owned by a construction firm, and was inspecting a roof at a particular address.

“That sounds like a step in the right direction,” added Ms Franke. “If we are moving into a world where drones will be more ubiquitous, we do need for anyone to get a sense of whether a drone is there for a legitimate reason or not."

Incoming regulation

All drone manufacturers will eventually need to adopt a system of remote identification in order to comply with upcoming regulation set to be put in place in different countries. The US Federal Aviation Administration, along with the country's Department of Transport, is expected to unveil proposed rules for mandatory remote drone ID next month - though that move as been repeatedly delayed. Even once agreed upon, the measures could take more than a year to implement. The FAA has told drone makers to come up with their own solutions in the meantime. DJI said it would roll out its Remote ID capabilities once its obligations were more clear. It could apply the changes to drone models dating back “several years”, it said.

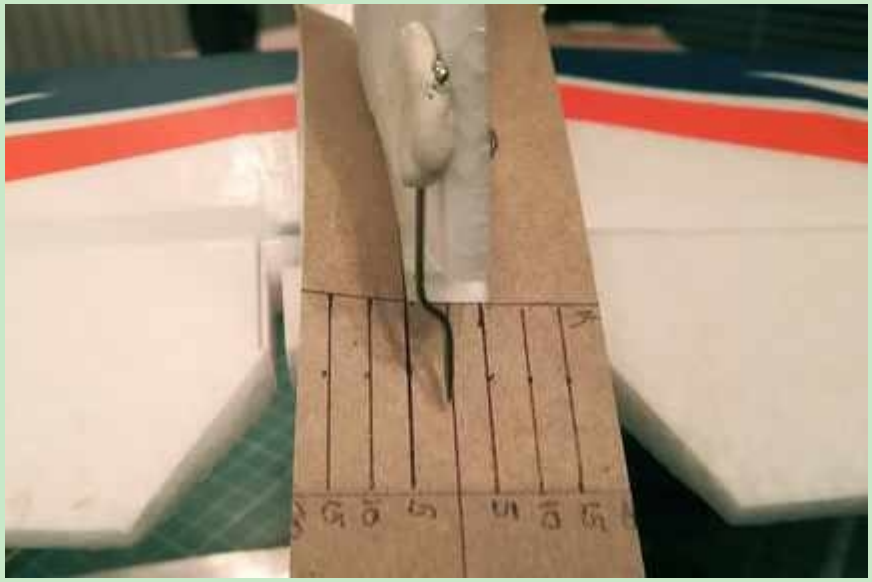
Widespread adoption of the technology will also be held back somewhat by so-far limited inclusion of the “Wi-Fi Aware” protocol in popular smartphones, such as Apple's iPhone, which currently does not support it.

Genius: Number 5: Throw gauges

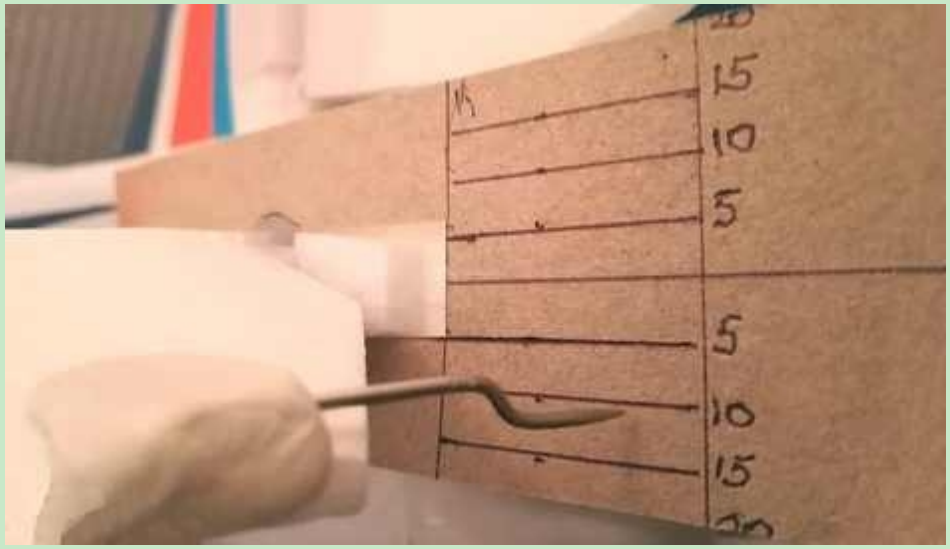
Keith Eldred's inventive brain has once again been working overtime. As he cautiously approached his maiden flight with his FMS Kingfisher model he was keen to set up the throws exactly. So he came up with two very neat designs for gauges.

Over to Keith. "These are my solutions to setting elevator and rudder throws. For the first version you just need a tee pin, Blu Tack and a cornflakes packet. It works well. It beats trying to hold a rule up to them. The ailerons and flaps were not so awkward."

The card gauge marked out in millimetres and the pin in the Blu Tack



The gauge being used on the rudder...

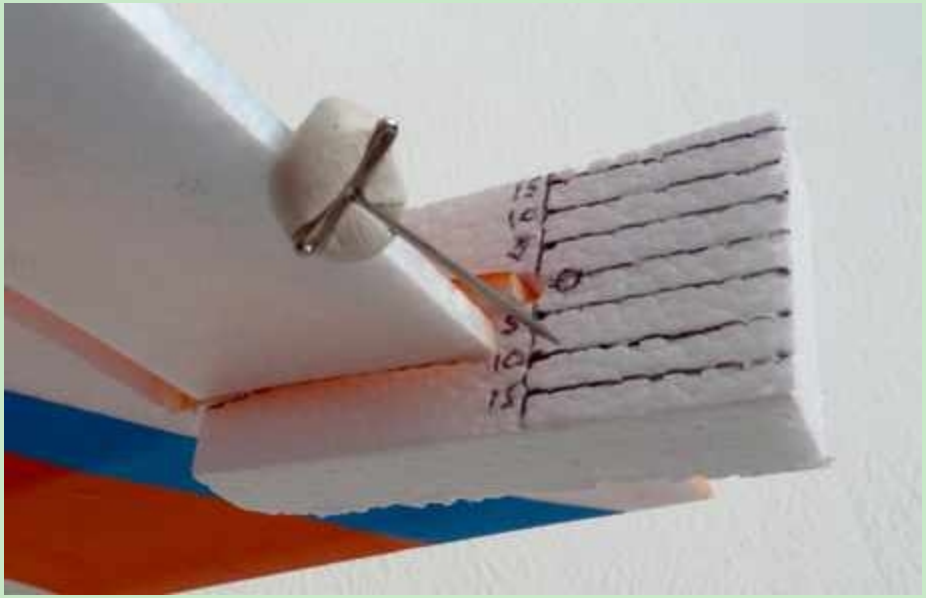


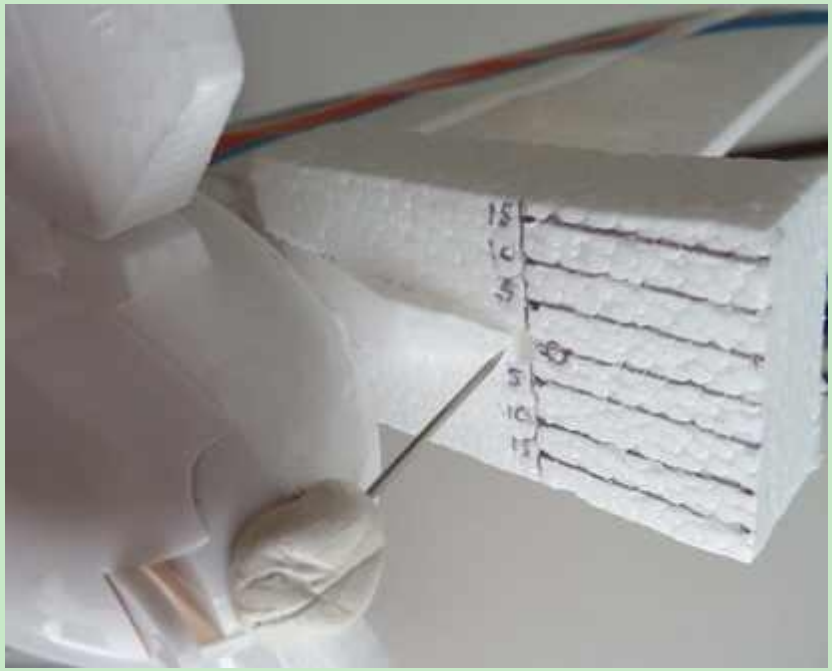
...and the elevator.

The second one is made from a scrap piece of foam. Keith says that you possibly need to make one for each model or even each control surface. Or maybe not. Anyway it only takes five minutes.

He says, “This Mk II version is really much better than the first. It just slides onto the wing or whatever, and the springiness of the foam gently grips the plane and is nice and firm. The pointer is then positioned to the neutral line with the Blu Tack in line with the trailing edge centreline. Then with the stick held in the appropriate direction the servo throw button is held down until the pointer reaches the deflection required.

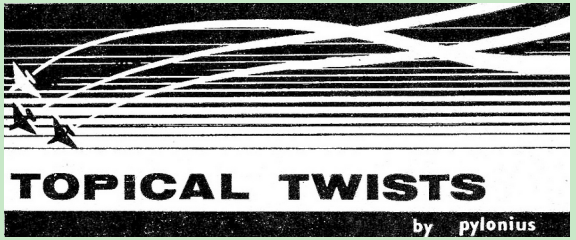
“The thing I like about it is that it can be used for all the control surfaces. Swapping from one wing to the other just requires it to be turned upside down. For the rudder and elevator, the gauge and pointer change places. The gauge moves and the pointer is fixed. The setting precision is excellent and definitely good enough to do the job.”





Pylonius

Look at the date and think how clever Pylonius was to foresee the trends.



Life Gets Tedious

Keeping up with progress is all very exciting and spectacular, but it can be jolly tiresome. Anything more complicated than a few sticks of hairy balsa, a lick of dope and a skein of rubber sets me groping for the telly switch. This makes me feel a bit sorry for the less ambitious of the up and coming generation who'd look pretty silly pottering about with steam age rubber models when all the big stuff is shunting to and fro between planets.

No, it looks as if the modeller of the future will have to get his supersonic pumps on if he hopes to keep in the running. The electronic super model of today might well be the kids' stuff of tomorrow, and when you've got to go one better than a multi-channel jet just to keep face with the neighbours, then it's time you turned in modelling for a stereo-panoramic telly.

It might well be that his salvation will be some new wonder self-building material, twenty times as light as balsa and as tough as a broiler chicken. Already the backroom boys have brewed up a plastic five times as light as the pappy root, now available in ready-made wing lengths. From this we might suppose that the modeller

of the future will buy his models by the yard, haberdashery style. For the do-it-yourself modeller a synthetic balsa will be provided, which, futuristically enough, can only be cut with an electric razor.

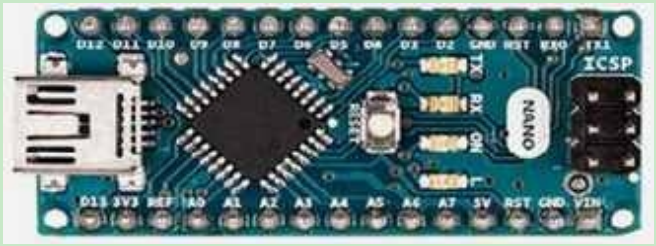
From Model Aircraft magazine January 1960

Use of Arduinos in model aircraft

What is an Arduino? It is a small, very cheap computer board intended for reading sensors and controlling things, for example switches, motors, lights and servos. It was designed by a group in Italy (https://www.arduino.cc) to get people to use computers in a more creative way. There is a set of these boards ranging in size from the Nano (18 x 45 mm and 7g) to the Mega (53 x102 mm and 37g). They differ mostly in the number of inputs and outputs. All are programmed using free software on a personal computer running linux, Windows or Mac operating systems. There are even smaller boards of differing shapes but they are not ready to use. They are intended to be built into devices.

The whole project is Open Source, which means that the software is free and users share their programs and designs online. Don't worry if you have never written program code. There is a huge range of ready written code for just about any job you might want to do. You soon learn how to adapt the code if you really need to. It's all part of the fun.

Here are the smallest and largest (not to scale):



Smallest (nano)

Largest (mega)

How does it work?

An arduino has several inputs of two types. Inputs are pins onto which you can put voltages:
Digital voltages, from a switch or other device, which can have one of two values (0 and 1), for example 0V and 5V.
Analogue voltages from sensors detecting such things such as light, sound, temperature, pressure, potentiometer voltages etc. These can have any value between say 0V and 5V. The Arduino digitises the value, which means it measures it and gives the value a binary number, for example between 0 for 0V and 1023 for 5V, in decimal. In binary these are 0000000000 and 1111111111. Ten **B**inary dig**IT**s (bits) are used so this is called 'ten-bit resolution'.

There are 10 types of people. Those who understand binary and those who don't.

It also has several output pins from which signals may be sent:

- **Digital outputs** give 1 and 0 in the form of a voltage, for example 0 or 5V. These could be used for switching lights, relays and so on.
- **Pulse width modulation (PWM) outputs** allow you to create varying signals. For example an on-off voltage could be used to drive a motor at different speeds, or a lamp at different brightnesses, by varying how long the signal is on rather than off (mark-space ratio). You could make sounds by sending varying signals to a loudspeaker. Do you recognise the abbreviation PWM? Yes it's the servo signal that our receivers produce. You can create the same servo signals with an Arduino and so control servos.

You either use standard code or write your own on your computer. You then send it to the Arduino through a USB lead. The chunks of code are called sketches. The software you need on your computer can be downloaded free from the arduino site.

How might we use one in a model?

Several (not multiple – yuk!) ideas spring immediately to mind.

As I said above an Arduino can create the pulse width modulation signals, that vary from 1 to 2 milliseconds in length, to operate our servos. They can drive low power servos directly but would need an additional board, called a shield, to boost the current for larger ones. Shields can be plugged onto an Arduino board. If you have a scale model with complicated undercarriage doors and mechanisms, you could build a sequencer that drives the door servos and retracts at a chosen speed and in the order you want. The Arduino would read a start signal from a receiver channel and then go into its retract sequences. Or you could even animate your pilot.

You could operate landing lights and steady or flashing navigation lights.

For rubber powered free flight models you could build an electric winder that would program and count the turns on a stepper motor. Yes, I have one of these in the design stage.

Free flight F1a/A2 gliders are released at speed from a 50m towline and follow a vertical S-shaped path of half a loop and half a bunt. They can gain up to another 50m in this way. The Arduino could control an elevator servo to do this without breaking the competition rules.

How to get started

You can buy a board, a power supply, a USB lead and a set of components for about £35, for example on eBay. You never know, you might get hooked on these control systems and start building all kinds of clever things. It is probably best to start with the middle-sized Uno.

Uno board	£4.98
5V power supply	£5.19
USB lead	£2.50
Sensor kit (37 devices)	£11.99
Stepper motor	£3.69
Connecting wires	£5.00

The sensor kit will include a huge range of input devices, to sense such things as light, infrared, sound, temperature, wetness,

proximity, tilt, joystick movement, vibration, time, rotation and magnetism and will have some output LEDs and sounders. You can use the small 9g servos that cost around £2 or low power stepper motors.

I have done a lot of work with Arduinos so please ask if you want more information about it.

Peter

People's Mosquito - the latest from 'Buzz'

Fast progress on the moulds

We are very pleased to report our supplier Retrotec continues to make excellent progress on the fuselage moulds at their East Sussex base. All the bulkheads are now on their box steel stands, the stands are now being painted in bright RAF maintenance yellow. Retrotec is now actively working on the in-fills and their varied designs, shapes that define each fuselage half.

Using our original de Havilland lofting drawings, combined with a modern CNC router, Retrotec cut the formers for both moulds in September. With the formers for mould A mounted on the full frame, the distinctive fuselage shape we all know and love starts to become clear.

Another question we get frequently on airshow stands is, 'If you're building new moulds, does that mean you could build more Mosquitoes? "The answer to that is of course, yes. Our fuselage moulds will be completely reusable, but let's focus on finishing RL249 first!

John Lilley Chairman TPM

Pillock of the month

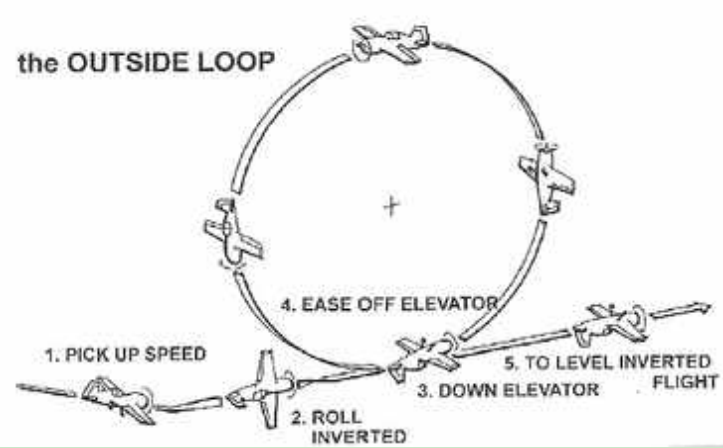
No POTM this month. I've run out of things to do wrong, mostly because I've been too busy doing DIY, and the rest of you appear to be perfect. Please share your follies with us all, so we can avoid doing the same. You can confess anonymously if the embarrassment is too intense.

Manoeuvre of the month: Outside loop

From RCSD January 1998

You all know how to do a loop, and you have tried inverted flight so now lets combine the two with the outside loop.

The Outside Loop is done exactly the same as the Inside Loop. The only difference is you fly it inverted. The model starts the Outside Loop flying inverted straight and level, and with a lot of airspeed, pushes down elevator down, flies up into a perfectly round 360 degree loop and finishes inverted straight and level in exactly the same heading.



The outside loop can be flown up as described above, or down. The model starts straight and level inverted, pushes up elevator (goes down) into a 360 degree loop and finishes, inverted flying straight and level. This is an easier outside loop because you don't need much airspeed to begin the maneuver because it starts going down instead of up. This maneuver is not particularly difficult, but as with all acrobatics, airspeed is really important. The key to all loops is keeping your wings exactly horizontal, and flying a perfectly round 360 degree vertical circle.
On windy days, or if you must do your loops cross wind, you sometimes need to steer the model through the entire loop to keep the wines exactly horizontal. This is why on windy days it's much more difficult to do precision aerobatics than it is on a calm day.

Just remember one very important thing: when inverted, up elevator makes the airplane fly down, and down elevator makes it fly up. *As* always, if in doubt, fly one mistake high! Now go out and HAVE FUN!

Bird in the hand

Having watched it on YouTube, Keith Eldred managed to catch his Bixler one-handed the other day. He assures me that it was deliberate and not an attempt to fight it off.

He also says, "Discovery! That hole in the front of the Bix is not for cooling the ESC, it's for the automatic addition of nose weight in the form of mud."

Cartoon: servo goes bad

From RCSD

Caption competition: Launch

My first attempt: “You really need long black boots to walk like that.”

You can do better. Email your entries to me.

Last month's entry

From Keith Eldred who is the winner:

"When I said I wanted a Jumper, I meant a cheap radio transmitter".

Puzzled? Then, you haven't seen the latest entry to the transmitter field, possibly a copy of, but certainly much like, the FrSky transmitters.

The Jumper transmitter

Spot the fault

Problem

This concerns an Acrowot foam-e. After a few sessions of smooth running, the motor started making odd noises and at one point cut out all together causing a controlled dead stick landing. The sounds varied, including bangs, growling and staccato rattle. They nearly always occurred at full throttle. The receiver and servos were powered by the battery elimination circuit in the electronic speed controller and the problem occurred even when the batteries were fully charged.

The ESC fell under suspicion first. It was replaced temporarily with a new one. When that didn't work the receiver was replaced. The one in the model had been involved in a crash so could have had an intermittent fault. That also failed to cure the problem. Where should the puzzled modeller look next?

Last month's answer

There has been no change of propellor. A higher voltage should cause an increase in rpm, as speed = kV rating x voltage. This will only happen if you use a propellor of smaller diameter or pitch. Both of these affect propellor loading which is diameter cubed x pitch. If this isn't done the motor will draw an increased current, which is what is causing the heating. This wastes energy and might even burn out the motor or ESC. One solution would be to move to a propellor at least one inch smaller. Remember that the energy wasted into heat goes up with the square of the current.

There is another possible reason. The new battery might have too low a C-rating. This is set by its internal resistance and though in general this is steadily improving this battery might have a high resistance. This also wastes energy as heat. However the fact that

the ESC is also heating up makes this less likely as it means that the battery is producing increased current. It always pays to connect a meter to measure current when making changes to an electric motor setup.

Though not relevant here, moving from a two bladed prop to a three or four bladed one can cause similar problems. Again a smaller diameter is needed. To find what size and pitch gives the same loading multiply the usual loading by the square root of the number of blades minus one (e.g. for three blades it is square root 2 or 1.414).

Health warning

Just when you thought it was safe to relax I have to warn about another threat. Allegedly it comes from Greece and is called Baklava, apparently pronounced *back-lavver*.

To its shame Lidl sells it. If you buy one box, you will buy two next time and then you are on the slippery slope. Most of the pieces are a little too big to go in the mouth in one go. However after biting a few in two you find yourself jamming them all in whole, crunching down into the luscious crisp pastry, filling and nuts and experiencing the intense high. When will this end?

Sources: CAA labels

Now you are registered with the CAA you will soon get a number and will need to put it on your models. An earlier note on the CAA site said that the number must be on the outside of the model. Not so. It can be in a compartment which can be accessed without a tool.

One option is to get a sheet of sticky labels printed. You can get them done through eBay, costing about £2 for 65. Try this item https://www.ebay.co.uk/itm/GOLD-SILVER-WHITE-Printed-Return-Sticky-Address-Label-Stickers-Personalised-99p/362667679191?var=631816733736

Another idea, suggested by Ian Ruston, is to use a strip label printer, for example by Dymo or Brother. You can get 12 and 9 mm wide self-adhesive tapes in differing colours and Aldi has a Dymo one for sale at £14.99 at the time of writing. This might be the better option if we have to register and number each model individually.

Oh yes. By the way the earlier news that we had to have it and a bar code tattood on our foreheads has proved to be untrue. For now at least.

Sales

None this month. Very nobly people put their surplus stuff into the AGM auction, which raised £85 for the club. Many thanks.

January events

2nd NMAC Indoor Flying 19:00 – 22:00 at The Open Academy, Salhouse Road, Norwich, NR7 9DL.

4th/5th New Year Fly-in (full-size) at the airfield

5th NMFC Climb and Glide 2020 session one 11:00

18th 'Insiders' Indoor Flying 12:00 to 15:00 at Stalham Sports Hall

19th NMFC Spot Landing 2020 session one 11:00

NOTE the changed time for the Insiders. The Sports Hall is yet another example of a stupid, and badly negotiated, privatisation, and is not now available on Saturday nights.