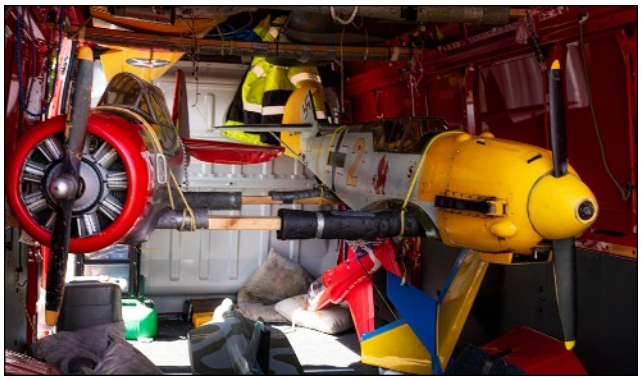
The 2019 Fly In

June 2019

Once again, we were blessed with a perfect weather. A very light wind but a really lovely sunny day. I arrived just before 10:30 and left Judy gently cooking in the car.

There was a rather menacing looking ME109 poking it's nose out of a van - nice one!



Pilots were being called to the start of day briefing followed by a demonstration flight by Mark Conlin with his big Decathlon to physically show the pilots the permitted flying areas.

After that the flying began. It was great to meet up with you guys again - it's been a long time since I've been able to get out.

Jake performing a low knife edge pass

Just look at those control deflections - the elevator appears to be folding beyond vertical ?

This biplane looks a bit tasty.

JP's Valiant and that lovely E-Flite Deuces Wild.

I regret that I could only stay for a short time but I enjoyed meeting up again with old friends. John Higgins pointed out to me that it was so lucky that it had been decided to hold the event on the Saturday and not the Sunday when strong winds would have made flying just a 'bit' difficult!

Great event guys.

Geoff Brown

It is a sad month that marked the passing of a guy who had been a loyal member of this Club - Geoff Brown who had been a member for about 30 years and was for some of that time serving as Secretary. Always an absolute gentleman, friendly guy who was always willing to help.

His funeral is to be held at the St Annes Cemetery 8th July at 12:30.

My Very Very Hot Fly In Saturday

Article and pics by Chris Vernon

So Saturday the 22nd of June arrived and the weather was perfect, what a change from the previous few days and what a change for our club to get a perfect flying day.

The masses assembled and the field was marked out to ensure a flowing stream of aircraft flying. The pilots brief was given and flying commenced. I had assembled my Valiant and put the 2 X 6s lipo's in the plane, it is a 12s system. I was in the second group to fly.

I took off did a couple of circuits, a couple of rolls and a stall turn. Resuming into the circuit after the stall turn the model slowed down for no apparent reason, a quick movement of the throttle stick and I had a dead stick on an electric model.

Fortunately, I was in a position in the sky that with the use of the effective flaps on the model I got back to the field albeit a downwind landing.

No harm done. As I approached the model I became aware of a strong burning smell and the atmosphere around the model was somewhat warm to say the least.

Immediately I thought there was a lipo fire inside the model so moved the model away from the flightline and away from the pits. Paul Cusworth lent a hand I quickly removed the top hatch to get access inside and was met with extremely hot air and a pungent smell.

A quick investigation established the lipo pack was intact and was quickly removed from the model and set aside. This lead to the thought that the speed controller had over heated and cut out after all it was a hot day.

My Very Very Hot Fly In Saturday continued..

June 2019

I left the model in the safe place whilst I investigated further. Looking through the air scoop all I could see was black smoke stains and black sooty powder, this was clearly not an over heating problem as the heavy gauge wires from the speed controller had melted and the small gauge wires had vanished !!!!!

Saturday evening I stripped off the cowl to fully investigate the issue. The speed controller had destroyed itself with majority of the electronics inside turned to powder or vaporised.

I have attached some photographs showing what is left of the speed controller and the smoke damage inside the engine bay.

I consider myself to be very lucky that a severe fire had not broken out inside the plane.

The speed controller I have had for a while now it came from HobbyKing and was correctly rated for my set up.

As a matter of interest,it is the same speed controller that caught fire in John Higgins Inverza a while ago.

My Very Very Hot Fly In Saturday continued..

A check on Google and apparently we are not the first to have some issues with this particular speed controller and it has now been discontinued according to HobbyKing, you do wonder why !!!

As flyers we do put our faith in many electronic devices and we do trust that they are up to the job, I guess the law of averages means that some will fail and HobbyKing will claim that many thousands of these speed controllers have been sold with no issues which is true and mine has lasted 18 months until now.

Google has also told me that for High Voltage speed controllers Castle Creations are the best. For my model the Castle Creations speed controller is £170.00 !!!!!

Another one from HobbyKing (different model) is £93.00. Is the Castle Creations better ??? - who knows ???? - do they make their own ??? - do they get them made in China ??? who knows !!!!!

Chris Vernon

A VIEW FROM THE HEDGE.

 (By Will Sparrow) June 2019

Sparrows are esentially optimistic little birds but the current spell of bad weather has provoked more than a few moans (you ought to try sitting on lumpy eggs in a soggy nest and see how you like it! – Gill Sparrow). Since there has been precious little model aviation to view, little groups inevitably congregate to share and amplify their moans: climate change seems very popular at the moment. I keep telling them not to confuse weather with climate change but I get the feeling that they are in no mood to listen. Your scientists have established that climate change is a man-made reality but a few folk are still sceptical. Similarly, there are a few of you around who continue to believe that the earth is flat (you mean it isn't? – Jim Sparrow).There is an ever-increasing mood afoot to reduce the country's carbon footprint. The Wise Old Owl reckons that whatever we do in this tiny little island, off the coast of Europe, will be of small beer when compared to what is happening in the rest of the world. He could see that this news made me glum, so he flung out an optimistic crumb…

By all accounts, Norway has resolved to convert folk to change from their petrol and diesel cars to electric cars. The big snag is that electric cars are much more expensive than conventional cars. The Norwegian govermment decided to even things up a bit. Electric cars have no VAT and no road tax so it is now actually cheaper, for most people, to have an electric car. Norway has cheap, plentiful electricity and a small population (unlike this country!).

The Owl's tale did not end there. He went on to say that your government was in the process of instigating a Norway-style strategy designed to apply to model aeroplanes. Engines over 10cc were to have extra levies applied to them and large petrol engines were to have 100% import tariffs imposed and as for gas-guzzling turbines… So much for the stick, now the carrot. Electric models were to be VAT-free and a government subsidy was set to reduce the price of Lipos by half! Pensioner modellers would be eligible for free battery chargers and free training would be given so they would know which buttons to press.

All this will totally change the model-flying scene. I remember my great-grand-pappy sparrow telling me how that, onceuponatime, the heady scent of ether could be inhaled across the flying fields of England, and burnt nitromethane and castor oil were enough to send the senses reeling. If you are at all nostalgic, my advice is to buy as many bits of i/c kit as you can, covet and savour them. Remember, they were the future once…

Just as happened at Camp Granada (What's he on about? – JS) a really good day arrived one Tuesday in mid June. The afternoon was warm and sunny with a light-ish breeze coming from due west, right down the centre of the strip: as usual, there was nobody there to take advantage of the conditions: I dozed on my twig. I roused as a single car made its way down the track of dreams. A canny member had been waiting for such a day to test-fly an unusual, large-scale electric twin that had suffered horrendous damage in a landing accident last summer and had been extensivly repaired over the winter months. After rigging, range checking and testing of everything that waggled or bleeped the lad lined up for take-off. He need not have been worried. The model accelerated smoothly, climbed away in a scale-like manner and joined the circuit. Because of the nature of the extensive repairs first flight testing followed as it would for a new model. The flight ended with a beautiful landing onto the softly-yielding turf. Four more flights followed before the modeller finally departed wearing a well-satisfied grin.

The very next day also proved great for flying and, being a Wednesday, the afternoon proved to be busy with aviation activity. One member, however, seemed to be taking his ease longer than most and seemed reluctant to give the beautiful new model he had brought its chance to explore its natural element. As I listened to the distant chat (we sparrows have very acute hearing) the reason became apparent. The modeller was not shy or reticent but was waiting for the designer of the aeroplane to turn up to witness the first flight. Come the designer come the hour; the model was ready to go, ticking over and lined up for take-off. As soon as the wheels broke ground it was obvious that all was not well. The owner had a tiger by the tail and the model was, to all intents and purposes, unflyable. The watchers in the pits collectively held their breath as the model swooped and dived over the far field, determined to end its existence. The owner fought the model all the way and, by some miracle, managed to get the model back to the strip for a very hard landing. The undercarriage was knocked off and there was a bit of damage to one wing - all repairable. Flying skill, together with good vibes from fellow modellers, saved the day! The post-flight analysis concluded that a rearward CG coupled with a tailplane which looked a little on the small side, lead to the near-death experience. As an aside, I remember when my mate, Jim Sparrow, was freshly fledged and had not yet grown a full set of tail feathers. He showed marked aerodynamic instability when trying to fly. We cured his problem by getting him to carry a haw in his beak so as to move his CG forward a bit. It did the trick for Jim. Who knows, you lot might learn something from us sparrows yet!
WS

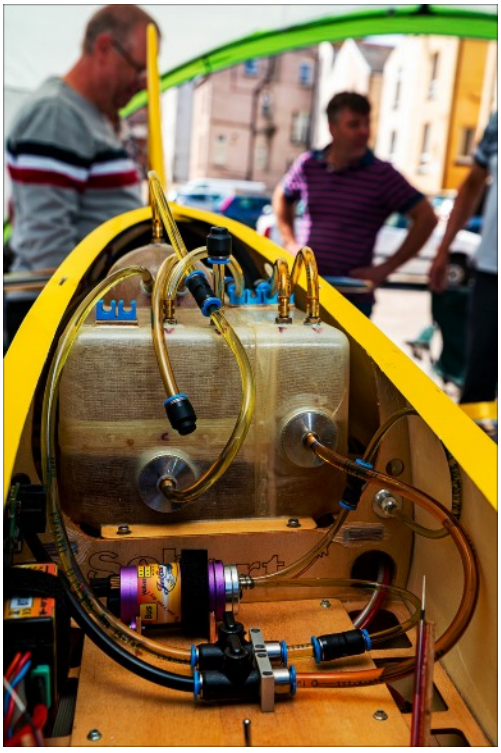
June 2019

Cleveleys Classic Car Show

Once again, the Club put on a static display at the Cleveleys Classic Car Show.

I was unable to attend but asked a couple of my friends from the photo club to get me some suitable pictures of our displayed models. Here is what they took.

These are some of Wendy's pictures



These were given to me by my mate Bill

Servo Specifications

June 2019

Article by Brian Holdsworth

Two servos with similar capabilities are the Hitec HS-81 and HS-85BB, being popular mini servos of ~18 grams. The 81 is one of the oldest servos still widely available, and has had several changes during its production history with different amplifiers and motors being fitted; it is also likely that various "improvements" have been made to the feedback potentiometer and details in gear and case construction. There are no apparent external indications or mentions in the supplied documentation of such differences. The 85 was introduced later with a ball-race on the output shaft, claiming improved performance, but considerably more expensive. Both have plastic gears, though metal-geared versions are available.

Experience with older examples, probably with different amplifiers, suggest that the 81 gears are somewhat fragile, with the 85 being more robust and considerably smoother in operation. Both have had potentiometers which showed excessive wear within a few years, resulting in their retirement from active duty! Several 81 amplifiers have failed in use, stopping operation - fortunately not driving to their limit stop! Inspection of several damaged servos show that the 85 gears have one more stage than those of the 81, allowing a higher gear ratio; the gears are also more substantial and so should be stronger; both seem to use the same potentiometer as other similar servos examined. Removal of the potentiometer for physical examination to confirm a diagnosis of an excessively worn track surface was not considered practicable, since it seems to have been glued in place. Identifying the actual problem is generally irrelevant in practice, since repair is not practicable and replacement is required!

Although presumably intended to be interchangeable, their case dimensions are slightly different though generally insufficient to cause problems. The 85 is heavier, 19.2 gram against 16.6 for the 81, due to its more substantial gears and case. While their output shafts have the same specification, the 85 output arms are a loose fit on the 81, so that the arms supplied with the servo should be used.

Both are specified for 4.8 to 6 volt meaning 4/5 cell NiMh or a 5 or 5.5 volt regulator - 2 cell LiFe, or particularly LiPo, would overload them leading to jittery operation, overheating and early failure. The 81 speed is quoted as 0.11 and 0.09 secs. for the two voltages and the 85 is slower at 0.16 and 0.14 secs, which is consistent with its higher gear ratio as above. Similarly, the 81 torque is 2.5 and 3.0 Kg.cm and the 85 is greater at 3.0 and 3.5 Kg.cm. The smoother operation of the 85 suggests that its speed is within

Servo Specifications continued...

the amplifier capabilities, while the 81 is too fast, resulting in inadequate damping and jittery operation, especially at 6 volts.

They are likely to use the same motor for production reasons, especially as the same type of amplifier is specified for both, being identified as "HT7003 Analog SMT". SMT (Surface Mount Technology) is becoming widespread, being generally more reliable and permitting more compact circuitry.

"Dead Band Width" is quoted for both as 8 microseconds which corresponds to about 1 degree of output rotation, barely perceptible in practice. The definition used by manufacturers is somewhat uncertain and so may have little value! It should represent the essential region of reduced output drive where the servo position almost matches that demanded by the transmitter controls, through the receiver, up to the point of maximum torque; the shape of this transition varies from steep to shallow and drawn-out in poor examples! If the region is too narrow, the servo is liable to oscillate round that position, which is obviously undesirable. If too wide, the servo does not respond to small movements of the transmitter sticks etc. If an increasing load is applied to the output arm, resistance should be felt to increase smoothly and proportionally over a small range of movement. A good servo should only allow a barely perceptible amount of movement before near-full torque is generated, but some have been seen to require over 10 degrees rotation, confirmed by their manufacturer's documentation! Some poor examples have a noticeable "kick" in their response as a threshold is reached within the amplifier, producing jittery operation - some digital servos show this unwanted characteristic.

Only one value is quoted for the various current draws, presumably for the maximum 6 volt, reducing proportionally for lower voltages.

"Current Draw at Idle", as the name suggests, is the current drawn when the servo is not moving with no load applied. This should be the consumption of the amplifier control circuitry with no current being taken to drive the motor. The 81 specifies this as 8 mA with 3 mA for the 85. Since they use the same amplifier, the difference will be due to the jittery operation of the 81 drawing some motor current.

Servo Specifications continued...

June 2019

Article by Brian Holdsworth

"No Load Operating Current Draw" is the current drawn when the servo is moving at full speed with no load applied. 280 mA is quoted for the 81 and 240 mA for the 85, lower due to its slower speed and consequently lower frictional losses.

"Stall Current Draw" is the current drawn when the servo is not moving with full load applied - ie stalled! It is largely determined by the winding resistance of the motor, reduced by its inductance, though it may be further reduced by the amplifier implementation characteristics where the full supply voltage is not continuously supplied to the motor; this latter effect can sometimes be identified where the specified maximum torque is lower than that of other similarly sized servos. 1,200 mA is quoted for the 81 and 1,300 mA for the 85 with no obvious reason for the small difference.

The HS-5070MH servo is an example of a digital micro servo, metal-geared and weighing ~14 grams, intended for HV use directly from a LiPo with its amplifier specified as "G1 Programable Digital". The motor is speciified as having Neodymium magnets rather than the usual Ferrite - any benefits are small for the considerable cost. It is specified for 6.0 to 7.4 volt meaning that a 4 cell NiMh or a 5/5.5 volt regulator would be inappropriate. Its speed of 0.14 and 0.12 together with output torque of 3.0 and 3.7 Kg.cm suggests a similar gear ratio to the 85 above, with a slight improvement from the motor or higher supply voltage. The current draws are also similar with idle at 3 mA, no load at 240 mA and stall at 1,300 mA. The dead band is quoted as 2 microseconds. For a digital servo, the drive needs be removed when the servo stops moving, otherwise it would continue to draw a high current, flattening the battery and overheating the electronics.

Since the width of a micro servo is the same as that of a mini servo, the major operational difference is the greater ruggedness of the mini servo with its greater volume for the gears. This is why a micro servo with plastic gears has a lower torque rating than most mini servos.

"Programable" (sic) means that some servo parameters can be modified by the user if a suitable programmer is purchased. This allows changes to the rotation direction, neutral position and throw. The deadband may also be increased and the speed slowed from the default. The failsafe position may also be specified, coming into effect when the driving pulses are lost from the receiver - such values would have no effect where these

Servo Specifications continued...

Article by Brian Holdsworth

pulses continue to be produced, as would be the case if the RF signal is lost so that the receiver enters "Fail-Safe". However, some receivers disable such outputs after a few seconds, meaning that the servo position would become undefined unless this capability was setup.

Servos intended for operation from receiver serial bus outputs need their address to be defined. Most current Futaba transmitters support this for their S-Bus servos with a menu option which also allows amplifier parameters such as "Boost", "Damper" and "Stretcher" to be changed, though these would very difficult for the general user to determine the required values - their availability could be regarded as an admission by their designers of performance limitations!

It will be noted that these stall currents are considerably higher than the often-quoted figure of 250 mA, which dates back to the earliest servos with their significantly inferior performance compared with current examples. They imply that up to 6 amps would need to be supplied by the battery etc for a 5-servo installation, obviously increasing for more or larger servos, which is well beyond the capability of the widely used NiMh batteries. With the additional voltage drop through the wiring, especially long extension leads, the result would be that the voltage reaching the servo would be reduced, limiting its current draw and hence torque, until within the supply capabilities. Similarly, an inadequately-rated regulator would result in a voltage drop until within its current capability. The impressive filtering incorporated in modern circuitry usually allows operation even with these extreme voltage fluctuations, although they are a major cause of the well-publicised Spektrum brownout issues.

Fortunately, practical usage is not quite as bad as this would seem to indicate, since the operating currents should be significantly lower in practice. Analogue servos can generally be assumed to draw up to about 1 amp, assuming operation within their capabilities. The BEC's incorporated in most ESC's for electric flight have been increased in capaacity from the early examples, and most incorporate an SBEC of 4 amps or so which should be adequate for a typical installation of up to 4 standard servos. Digital servos will draw greater transient currents than their analogue equivalents and some suppliers, such as EFlite, have further uprated the ESC's in some of their RTF's with digital servos after reported failures.

Servo Specifications continued...

Article by Brian Holdsworth

The HS-5805MG and HS-5765MH are large digital servos with the first for 4.8/6.0 volts and the other for HV operation from a LiPo (6.0/7.4 volts). Dimensions are similar with the first being slightly bigger and heavier (197 gram against 172 gram). They quote the same amplifier, "G1 Programable Digital", with deadband of 5 microseconds; while this amplifier is the same as the HS-5070MH above, the output stages will (hopefully!) have been uprated to handle the higher currents. Speeds and torques are comparable with 25 Kg.cm at 7.4 volts, drawing about 6 amps. However, the first draws half the no load current (580 mA against 1,100 mA) suggesting that 7.4 volts is beyond the motor capabilities, driving it into saturation. These are significant currents and would require heavy wiring etc. and regulator capability, if used, would need to be considerably greater than that of the commercial equipment seen...!

Club Instructors

Jason Reid, John Higgins, Chris Vernon, Mark Conlin, Brian Holdsworth, Jim Sheldon, Paul Cusworth, Andy Harrison, Justin Goldstone , John Prothero

Shows 2019

6th - 7th July	LMA Cosford
10th - 11th August	LMA Elvington
31st August - 1st September	LMA Much Marcle

Club Events

21st July BMFA Scale event

Scale and Aero Show Trophy Event - TBA

June 2019

In Conclusion

Summer appears to have finally started and the really warm weather is just around the corner. I was so pleased to have been able to go to the Fly In.

Thanks to all you guys who have once more very kindly given me material to put in this newsletter.

You members who made it to the Fly in will know that the very popular Allan Bates is with his gorgeous partner moving to America. We will miss you very much but wish you all the best for the future. Do keep in touch.

THE BOSS

Allan

Allan piloting his Demonstrator at the Fly In.

Superb Pilot

Superb Singer

Top Guy

Keep in Touch