



HOLDFAST BUZZ

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modelflight RC

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Christmas BBQ
Sun Dec 2nd
Save the Date!

Please join us for the Annual Christmas BBQ and trophy presentation on Sun Dec 2nd.

Lunch provided.
Partners welcome.
Full details on p. 3

Minister Gives HMAC a Thumbs Up



Our Club was recently visited by David Speirs MP, Minister for Environment & Water, who took a keen interest in how we manage our facility. David is very focused on conservation and gave us an insight into future plans for development of the local area, primarily a new national park encompassing Glenthorne Farm. Pictured above (L-R) are Kingsley Neumann, David Speirs, Geoff Haynes.

The HMAC newsletter is your vehicle for sharing information, experiences, building projects, etc. with your fellow members. If you have photos of your latest model, a construction in progress or handy tip you'd like to share, please send it to Geoff at buzz@holdfastmac.asn.au for inclusion in a future edition of BUZZ.



Kingsley Neumann

"... Always remember to do a thorough pre flight check, identifying the control responses before EVERY flight ..."

From the President

We have just experienced about the wildest weather I can remember. Fortunately the strong winds and rain hit Adelaide overnight and we were in the middle of a Committee Meeting in the Clubrooms when the storm hit. Luckily no real damage occurred but we did have a failure of the room lights, probably due to water ingress.

The committee enjoyed a presentation by Michael Garrod, Project Manager for the introduction of the new Glenthorne National Park. This sounds like a positive development for us and should not have any affect on our flying activities. We can expect to see more people in the various areas of the National Park.

It is therefore a good time to remind all Club Members that we do not have unlimited access to the entire area surrounding our field. We must take great care to always operate our aircraft safely and avoid the published No Fly Zones. This includes the area due east of our field beyond 150 meters from our fence. We do have very busy roads nearby.

It is easy enough to avoid these hazards by simply operating close to the field. That's where you really want to be anyway. It is most enjoyable to see your aircraft at close quarters, but very unnerving to see it disappearing in the distance. Our main runway direction is aligned north/south, with the correct circuit pattern always turning away from the roads. If something does go wrong, our leased area is the safest place to be. And remember, the maximum height permitted for RC planes is 400 ft above ground level (except for certain Clubs which have approval). If a full size aircraft approaches our field you must give way and land to avoid conflict.

Always remember to do a thorough pre flight check, identifying the control responses before EVERY flight. And don't forget that you

MUST conduct a Range Check and a Fail Safe check before the first flight of the day with each aircraft.

The end of year Christmas BBQ will be held from 12.30 PM on Sunday December 2. Seating is limited in our Clubroom, so please get there early if you intend to come. Overflow seating will be available outside. This is an extension of the normal monthly BBQ. Trophies will be presented to the winners of Club competition flights and there will be President's awards to some people. The Club supplies food and soft drinks. You may supply the beverage of your choice.

Some of the Fun Fly Assassin wings were seen recently with Members building up confidence on these versatile, tough machines. Hopefully we can develop the casual competition as we head into 2019.

Electrical installation is the final stage for our new shed. This is expected to occur on Saturday December 8th and power may be disrupted on the flight line. Our shed has withstood the test of near cyclonic conditions and is looking very nice. We have a small ride-on mower which was donated by a relative of Ted Carter and skilfully restored to working order by Ted. We also acknowledge some work done by Club Members Graham Paterson and Aaron Watson to repair our vintage tractor and flail mower. Much appreciated, Graham and Aaron!

Our next Social Meeting is on Friday December 7th and it will include an evening Fun Fly from about 6.00PM. Why not come along and enjoy the beautiful calm summer evening before the 7.30 PM meeting?

Merry Christmas to everyone!

Kingsley Neumann
President



December General Meeting

Please join us on Friday December 7th for an informal social gathering. We will start with an evening fun fly session commencing at 6:00 pm, followed by the general meeting at 7:30 pm when we will update you on Club activities. Members are also welcome to bring along their latest creations for "show & tell". See you there!



Christmas BBQ + Trophy Presentation

HMAC Clubroom
Sunday December 2nd
12:00 pm onwards
(lunch served at approx 12:30)

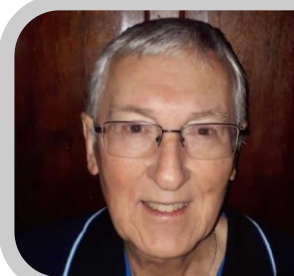
Lunch & soft drinks provided
BYO alcohol

Partners Welcome

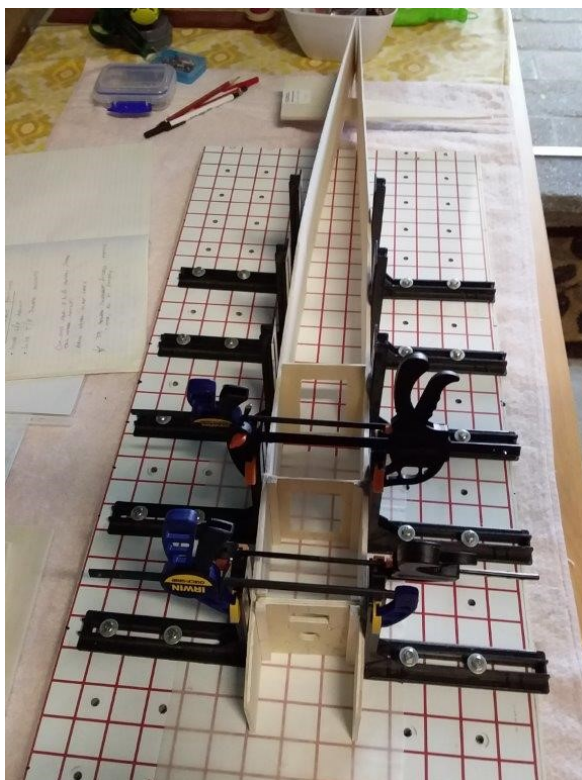
To assist with catering, please RSVP to
secretary@holdfastmac.asn.au
by November 29th



Hybrid Model - the Build - by John Jefferson



The building bug keeps coming to bite me and I struggle to ward it off. There I was; sitting in my shed/workshop/hangar looking at the collection of left-over material and spare parts that have accumulated over the years. I had a perfectly good wing from my combat P51 Mustang that met a premature end; the fuselage acted like a crumple zone in a motor vehicle accident but the wing survived. I had plenty of balsa and some assorted plywood, a box with numerous offcuts from previous builds and rolls of covering. Never throw anything away, you'll need it sometime in the future for repairs or build projects. Hmm, there's definitely a project here. What about building a fuselage for the P51 wing? Yes, but this time it would be electric powered instead of glow. Fossicking through my parts bin I found a brushless outrunner electric motor, propellers of various sizes, 100 Amp speed controller, on-off switch, three servos, 6 channel receiver, three 4S 2200 mA li-po batteries, wire for main undercarriage legs, main wheels and even a tail wheel assembly. Wow, this was all I needed to make a new fuselage to fit the wing.



What to build? A Mustang fuselage which is what you'd expect with a Mustang wing; or something different, a hybrid perhaps? I had a few plans of warbirds including a Mustang as well as some sports models. Eventually I decided on a 1930/40s era open cockpit, vintage aircraft style. The plan I had was intended for a glow powered non-scale model but it would be easy to modify it to suit the wing and electric power. Coupled with the Mustang wing it would certainly be different but not extreme. After all, the Mustang was a 1940 design, so the wing would be in keeping with the timeline of the fuselage style I chose.

"... The plan I had was intended for a glow powered non-scale model but it would be easy to modify it to suit the wing and electric power ..."

Ok, time to get to work. First task is to make a cardboard template of the wing profile so an accurate shape is cut into the fuselage sides where the wing will be seated, making sure there will be a small positive angle of incidence. Then proceed to cut out the fuselage sides, doublers, formers, firewall and tail feathers. The firewall was cut, drilled and fitted with blind nuts to suit the electric motor. Glue the doublers to fuselage sides, making sure there was a left side and a right side (only once did I make two of the same; that mistake hasn't been repeated since). Next task was gluing the formers in place, followed by the firewall.

Plywood hard points were made to attach the wing using the traditional bolt and dowel method. Similarly, ply was used for the tail wheel mount, battery tray, speed controller and servo mounts. The trick here is to position the electrics so that the centre of gravity ends up where it should and not have to resort to adding lead fore or aft to balance the model.

Time to check the wing's angle of incidence. Out with the incidence meter; I set the tailplane at 0° and the main wing ended up at $+2^\circ$. This arrangement looks good, but the test will be the maiden flight.

Next task is to make a removable top hatch to facilitate battery installation and removal without having to take the wing off. Out with the pencil and graph paper to draw up a workable solution. After that I need to make a cowling for the front end; and because the Mustang wing has the classic air intake scoop at the bottom of its trailing edge I need to blend that shape into the bottom of the fuselage. More fiddly work.

Building with modified (or without) plans certainly is a challenging but worthwhile exercise. I expect the model will fly without too much tweaking. However, my main problem will be where to store it in the hangar – there's not much room left!

To be continued...



A Refresher on LiPo Batteries - by Kim Whitburn



LiPo batteries are constructed using Lithium Polymer chemistry (hence the name LiPo). They have a very high energy density compared to other types of batteries. Batteries with a higher energy density are able to store much more energy compared to other batteries of the same weight with a lower energy density, which is why LiPo batteries are so popular.

LiPo cells may be used individually or connected together in series to form the required battery. An individual LiPo cell is a battery in itself and has a nominal voltage of 3.7 volts. By connecting more cells in series, the battery manufacturer can provide various voltage packs to suit different applications. A 2 cell battery pack will provide a nominal 7.4 volts, a 3 cell 11.1 volts and so on up to 6 cells are common. The number of cells defines the voltage of the battery pack.

When you use a LiPo battery the voltage will drop as it reaches its discharged state. It is important not to let its voltage drop below 3.0 volts per cell, else its capacity may be adversely affected. You must also ensure that the maximum voltage across a LiPo cell does not exceed 4.2 volts. If the voltage of any LiPo cell in your battery pack goes beyond this range it can cause the chemicals to become unstable leading to very high internal pressures which can result in a fire, so for this reason LiPo battery chargers are designed to ensure you only charge each cell to 4.2 volts. While using your LiPo batteries most ESC's have a cut off voltage which may reduce power to the motor when the voltage of your battery pack gets low in an attempt to avoid over-discharging cells.

Note however that most multi-rotor ESC's have this feature disabled as a motor suddenly being cut off would result in your model crashing out of control. Warning systems are often used to provide the pilot with a warning of low battery voltage.

Batteries are rated in milliampere hours (mAh) which is a measure of how long it can provide energy for a given current draw. Put simply the bigger this number, the more capacity the battery has.

The battery discharge rate is a very important specification, also known as the battery C rating specifies how fast you can extract the energy from your battery. If your motor continuously draws more energy than your battery is rated for it may result in permanent damage to it.

To convert a 2200mAh rating to amp hours, simply divide by 1000 i.e. $2200(\text{mAh})/1000 = 2.2\text{Ah}$ (amp hours). To calculate the actual maximum current you can draw from a battery in Amps you simply multiply its rated capacity by the C value so a 2200mAh (2.2Ah) battery with a C rating of 25C could safely provide a continuous current of 2.2×25 or 55A, and its capacity will be exhausted in 1/25th of an hour. Some batteries also specify a burst discharge rate (burst C), representing the peak discharge the battery can provide for short periods of time usually 10-30 seconds. Use the same simple formula above to calculate this peak rate.

Charging LiPo batteries.

When charging your LiPo battery do it outdoors in a suitable location to minimise property damage should something go badly wrong. Also very important to never leave a LiPo to charge totally unsupervised, keep an eye on it from time to time. Be aware that inferior B grade LiPo batteries exist and apart from being cheap they are inferior in performance and safety aspects. Use premium brand LiPo batteries from a reputable hobby supplier and the same can be said about the battery charger. The old saying, 'you get what you pay for' is very relevant in both cases.

- Charge your batteries outside in a fireproof location, or in a LiPo safe bag.
- Never charge your battery unattended, from time to time check to see if your battery is getting warm to the touch or starts to swell (puffy). If so stop charging immediately and seek advice before using that battery.
- Never charge a damaged battery, don't charge if it is swollen (puffy) or has any other visible signs of physical damage.
- Ensure the batteries to be charged are around ambient temperature, let them cool if they feel hot, warm is ok.
- Ensure the number of cells and battery type are set correctly on your charger to match the cell count in your battery if using a programmable battery charger.
- If using a programmable battery charger always use the balance charge function. During the charge process the battery charger will constantly monitor the voltages of each cell and manage them to ensure they are all at the same voltage.
- To be safe, always charge your battery at no higher than 1C (it's mAh rating) or less. Many chargers allow you to set a charging rate, and although some batteries can support higher charge rates (which speeds up charging time), it's always best to charge at 1C or less as this means the battery will be under less internal stress, gain energy slower thus keeping it more stable and ultimately resulting in your battery having a much longer life in terms of charge/discharge cycles.



A Refresher on LiPo Batteries - cont.

Storing LiPo batteries.

- LiPo cells have a voltage range for the chemicals to stay stable while being stored to ensure you get the best life from them. They typically lose approximately 1% of their charge per month through self discharge.
- You should store your battery between 3.80 - 3.84 volts per cell (40% to 50% charge). This is why when purchasing a new battery, it will only be partially charged. If you are flying on a regular basis (every few days) then this is less important as it will not have any noticeable effect if left fully charged for a few days, but if storing for a week or more you should ensure it is at around 40% to 50% charge.
- Always store your batteries in a fireproof location. You can always use an old ammo case available from disposal stores. It needs to be made from fire resistant material.
- Ensure the batteries are stored at room temperature.

State Of Charge vs. Lipoly Pack Voltage

% Capacity	1S Cell	2S Pack	3S Pack	4S Pack	5S Pack	6S Pack
100	4.20	8.40	12.60	16.80	21.00	25.20
95	4.15	8.30	12.45	16.60	20.75	24.90
90	4.11	8.22	12.33	16.45	20.56	24.67
85	4.08	8.16	12.25	16.33	20.41	24.49
80	4.02	8.05	12.07	16.09	20.11	24.14
75	3.98	7.97	11.95	15.93	19.92	23.90
70	3.95	7.91	11.86	15.81	19.77	23.72
65	3.91	7.83	11.74	15.66	19.57	23.48
60	3.87	7.75	11.62	15.50	19.37	23.25
55	3.85	7.71	11.56	15.42	19.27	23.13
50	3.84	7.67	11.51	15.34	19.18	23.01
45	3.82	7.63	11.45	15.26	19.08	22.89
40	3.80	7.59	11.39	15.18	18.98	22.77
35	3.79	7.57	11.36	15.14	18.93	22.72
30	3.77	7.53	11.30	15.06	18.83	22.60
25	3.75	7.49	11.24	14.99	18.73	22.48
20	3.73	7.45	11.18	14.91	18.63	22.36
15	3.71	7.41	11.12	14.83	18.54	22.24
10	3.69	7.37	11.06	14.75	18.44	22.12
5	3.61	7.22	10.83	14.43	18.04	21.65
0	3.27	6.55	9.82	13.09	16.37	19.64

Stay in the white region for maximum pack longevity



Flying Achievements

Award	Member	Instructors
Solo	Kris Duda	Ashley West, John Jefferson



iX12

Pilots Are Talking

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"This is the transmitter I have been waiting on! Thanks for staying innovative." - Eric Szchmidt

"Thanks Spektrum for being a Leader" - Robert Wilhelm

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Newcomers to R/C modelling are catered for by setting aside every Sunday morning from 10 am when qualified instructors will teach all aspects required for the safe operation of the model. During the training period no other models are allowed to fly, ensuring the least possible distractions to the student.

UPCOMING EVENTS

- Sun Dec 2 - X,mass BBQ
- Wed Dec 5 - MASA Meeting
- Fri Dec 7 - General Meeting
- Wed Dec 19 - Committee Meeting

Pylon & Combat Competition Results

Oct 7th

Open class pylon

Pete Smyth (HMAC) 101
Graham Paterson (HMAC) 86
Pete Robertson (HMAC) 63

Standard class pylon

John Jefferson (HMAC) 72
Barry Grivec (HMAC) 61

Electric class pylon

Pete Smyth (HMAC) 55
Vin Pike (HMAC) 52

WW I combat

No missions flown

WW II combat

No missions flown

Nov 4th

Open class pylon

Tom Jacobsen (Noarlunga) 108
Pete Robertson (HMAC) 95
Graham Paterson (HMAC) 84
Finn Kanck (Noarlunga) 11

Standard class pylon

John Jefferson (HMAC) 73
Barry Grivec (HMAC) 14

Electric class pylon

Bob McEwin (HMAC) 56

WW I combat

Barry Grivec (HMAC) 11
John Jefferson (HMAC) 1
Luke Szarek (HMAC) 1

WW II combat

Barry Grivec (HMAC) 6
John Jefferson (HMAC) 1

Welcome!

The Club extends a warm welcome to new members Kris Duda and Steve Auch-Schwelk who have joined in recent weeks. We hope you all continue to participate in this enjoyable, sometimes challenging sport.

Instructor Roster (Dec - Jan)

Date	Instructor	Instructor	Assistant
DEC 2	John Jefferson	Kingsley Neumann	Ted Carter
DEC 9	Kim Whitburn	Kingsley Neumann	Geoff Haynes
DEC 16	John Jefferson	Luke Szarek	Ted Carter
DEC 23	Kingsley Neumann	Kim Whitburn	Geoff Haynes
DEC 30	Luke Szarek	John Jefferson	Ted Carter
JAN 6	John Jefferson	Kingsley Neumann	Geoff Haynes
JAN 13	Kim Whitburn	Luke Szarek	Ted Carter
JAN 20	Kingsley Neumann	Kim Whitburn	Geoff Haynes
JAN 27	Luke Szarek	Kim Whitburn	Ted Carter
FEB 3	Kingsley Neumann	John Jefferson	Geoff Haynes

The following instructors are often available and are invited to assist when they can:
Shawn Jones, Ian Cole, Ian Williams, Ashley West

The Club is fortunate to have a dedicated band of Instructors and Assistants who offer their services to learners almost every Sunday. We would like to have more people on the Roster to ease the workload. If you can help please speak up and we can arrange the necessary Instructor Course. Gold Wings standard is a prerequisite for all Instructors.