



SWARMS Propwash

May 2003

New committee members:

President:	Ian Clapp	Ph 97272210
Secretary:	Brod Meredith	Ph 97272305
Treasurer:	Paul Dodge	Ph 97252527

Snr Safety Officer:	Bob Main
Deputy Safety Officers:	Dennis Green/Larry Allen
Canteen officer:	Brenda Green
Newsletter editor:	Paul Dodge (dodgey@iinet.net.au)

Presidents report

Hi everyone - Clappy here.....

Thanks very much for nominating me as the President this year - I'll do my very best to move us forward and provide some positive direction. Also many thanks to Selwyn for holding the fort over the past year. We all knew it wasn't his cup of tea but then to be fair to Selwyn no-one else offered to do it and he will be remembered for the great job he did organising the Xmas party which would have to be one of the best ever.

I reckon now with the members of the committee that have been elected this year we have a strong team and should be able to make some good progress. We have started work on the shed preparations and now there are trenches/holes/pipes etc all over the place so please be careful. The shed itself will be delivered soon and then we can all start to get excited with hopefully a quick erection of the building. If you wish to help please let me know asap.

Well that's all for now - see you at the field.

Ian

Events for 2003 at Swarms field

- 1st June – Working Bee/Sausage Sizzle
- 9/10th August – R/C Scale Rally
- Sept (date to be confirmed) - Old Timers contest

Is anyone interested in a day out at the Margaret River Wineries? I expect the cost to be around \$25ea for a bus and say another \$20ea for lunch. We should be bale to pick up and drop off. Please enter names on the list on the table if interested.

Dodgey



Ray Datodi getting ready to fire up

Happenings



Here is a photo of Ian Humphryson's 'real' plane which is a two seater and is currently being built at his works factory. Ian has just returned from a holiday in Qld where he was having some special metal parts made. The airframe is all made of wood and everything is just glued and held together with a special epoxy - something to bear in mind when your 5,000 feet up in the air! Ian says it's the best method to make a small plane as doesn't become subject to fatigue like a metal aircraft as the wood is more flexible – therefore it should last forever! The engine will be a 4 cylinder air cooled (VW type) with direct drive to the propeller.



Well the weather has finally started to turn with the wind quietening down but still being warm and producing some ideal flying days. According to my yachting friend the next two months are the most calm so make the best of it. I managed to write off my trainer and am still not sure what happened. It may be that its possible to loose signal when banking directly away and the transmitter antennae is directly lined up with the aircraft antennae or maybe interference. This has now happened twice to me in exactly the same position (banking steeply away over the wire fence and I have heard of several people doing the same thing. If there is momentary loss of signal then that could just be enough to make recovery very difficult for an inexperienced flier when performing a steep turn close to ground. Some of the high performance jets now have two aerials on the fuse large – the normal one plus a short whip type sticking vertically up from the front. This should prevent any loss of control due to positioning of the aircraft - I will (try to) investigate this further. Anyway Brod has been having bad luck with a couple of crashes one with his new

sports plane when the covering came loose at the leading edge of the wing and destroyed the airflow. The following week he also wiped out his trainer in a tree. Please note that those trees can move around at lightning speed and are quite unpredictable at times as I have found out as well to my misfortune. Dave Shearer is continuing to gain confidence with his new pattern ship with Larry giving him guidance. Shane has a new pilot PC-9 on order and is also making some plastic planes which he tells me are indestructible (just let me fly them and we'll see!).



Here's a photo to scare you all – John and his affectionately known 'Pig' or Piper Pawnee! I reckon John puts in more hours than anyone (okay so I'm jealous) and gold wings are expected soon. John showed me around his new workshop the other day – very impressive - exactly what I want for Xmas!

Someone who is not seen too much at the airfield as he lives out at Collie is Clayton Isbel. Here is a photo of him and his trainer (have you noticed how Shane keeps sneaking into the photos!!)



Ken Grant keeps threatening to move to NZ – we'll be sad to see you go Ken although they have some great clubs over there and you will definitely have to learn to fly in windy weather I can assure you - no more electric!

This is Carl Beyboers P51. Carl is a new member who runs his own business and normally can't make it to the field on Sunday



and here is a photo of the real thing taken at the recent Busselton show..



Least but not last is a photo of Bob's PT-17 having had its maiden flight. It's a beautifully made plane with nice detail in the cockpit and since the photo now has two very realistic pilots added. Please don't ask him if its an ARF – I've already made that mistake!



I need more photos for the newsletter so bring along your 'pride and joys' to the club.

Dodgey

**ANNUAL GENERAL MEETING
PEPPERMINT HILL FIELD**

4 May 2003

The meeting was opened at 10.30am.

Present

Ken Grant Brod Meredith
Dennis Green Selwyn Saunders
Paul Dodge Alf Rutland
Ian Clapp Bob Main
John Knowles Ken Turner
Roy Warren Richard Smargiassi
Colin Earl Larry Allen
Rufin Targiel
Shane Ballingall

1. Minutes of the Extra-Ordinary meeting of 4/8/02 were read and accepted.

Moved: Bob Main
Seconded: Ken Grant

2. Nomination for President

John Knowles nominated Ian Clapp as the new President. Ian accepted.
Seconded: Dennis Green
Carried Unanimously

3. Nomination for Secretary

Colin Earl nominated Brod Meredith to carry on as Secretary. Brod accepted.
Seconded: Larry Allen
Carried Unanimously

4. Nomination for Treasurer

Larry Allen nominated Paul Dodge to carry on as Treasurer. Paul accepted.
Seconded: Dennis Green
Carried Unanimously

5. Nomination for Catering Officer

Selwyn Saunders nominated Brenda Green for carry on as Catering Officer. Brenda accepted.
Seconded: Larry Allen
Carried Unanimously

6. Nomination for Senior Safety Officer

Selwyn Saunders nominated Bob Main as new Senior Safety Officer
Seconded: Larry Allen
Carried Unanimously

7. Nomination for Safety Officer

Selwyn Saunders nominated Dennis Green to carry on as Safety Officer
Seconded: Alf Rutland

Carried Unanimously

8. Nomination for Safety Officer

Bob Main nominated Larry Allen as new Safety Officer
Seconded: Dennis Green
Carried Unanimously

9. Committee

Dennis Green moved that the Committee consist of the following elected representatives:

- President
- Secretary
- Treasurer
- Senior Safety Officer
- Catering Officer

Seconded: John Knowles
Carried Unanimously

10. Treasurer's Report

Balance of \$1400 cash with \$4000 to be withdrawn from the debenture stock leaving \$3000 in fixed term deposit.

There was general discussion on insurance in relation to the costs and the extent of coverage. Colin requested that the insurance policy details be made accessible to members. Committee to contact AWA/MAAA.

11. Fees

The Treasurer advised of the proposed fees for the 2003 – 2004 season:

Seniors	\$220
Pensioners	\$200
Family	1 adult membership + insurance (+ AWA & MAAA fees) for each family member
Junior	\$80
Associate	\$140
Social	\$20

Bob Main moved that the fee structure be accepted.
Seconded: Larry Allen
Carried Unanimously

Nomination Fees were discussed.

Bob Main moved that the \$50 Nomination fee be retained – juniors to be exempt from nomination fee.
Seconded: Selwyn Saunders
Carried 10 votes for to 5 votes against.

Meeting was closed at 11.45am
Brod

**ORDINARY MEETING
PEPPERMINT HILL FIELD**

4 May 2003

The meeting was opened at 11.50am.

Present

Ken Grant	Brod Meredith
Dennis Green	Selwyn Saunders
Paul Dodge	Alf Rutland
Ian Clapp	Bob Main
John Knowles	Ken Turner
Roy Warren	Richard Smargiassi
Colin Earl	Larry Allen
Rufin Targiel	Shane Ballingall

1. Minutes of the previous meeting were read.

Ken Grant advised that minutes did not fully address the issue raised by Bob Main in relation to relocation of the new shed further back.

John Knowles moved that the minutes be accepted subject to the additional comment on the above issue.

Seconded: Dennis Green
Motion accepted

2. Business Arising from the Minutes

- i) The Treasurer advised that the club's financial records had been returned unaudited. John Knowles advised that he might know of an appropriate person to undertake the audit for the club. He will investigate and report back.
- ii) Ian Clapp advised that there would be a Maintenance Board erected in the new shed.

3. Correspondence

There was no correspondence.

4. Treasurer's Report

The meeting accepted the Treasurer's report from the AGM.

5. General Business

i) Ian Clapp moved a vote of thanks for the outgoing President Selwyn Saunders for his efforts over the previous 12 months.

ii) Scale Fly-in
Ian Clapp advised that the dates for the fly-in are 9 – 10 August.

iii) Flying Times
Alf Rutland raised the issue of flying times and the meeting was advised by Ian Clapp that flying could occur seven days a week but was restricted to an 8 am start. There were no official finishing times but the Secretary did advise that towards sunset aircraft became difficult to see because of silhouetting thus making flying unsafe and should not continue.

iv) Progress of the Shed
The meeting was advised of the progress of the shed. It is anticipated that it will be delivered by the end of the month with an erection to occur shortly after. Ian Clapp advised the meeting that would still be a large number of incidental purchases to be arranged including sand, cement, pipe, fittings, blackboards etc.

Larry Allen moved that items for the erection of the shed be bought as required and need not be brought back to the meetings every time.

Seconded: Bob Main
Motion carried.

v) Sausage Sizzle
Bob Main moved a motion that the sausage sizzle prices be increased to \$2.50.

Seconded: Larry Allen
Motion carried.

vi) Larry Allen advised that he had some demountable office partitioning that he was going to dispose of soon. If the club wanted it he would provide it free to the club. Ian to advise Larry if required asap.

vi) Safety
Ken Grant raised the issue of safety for members currently starting their aircraft on the strip in front of the pits. There was general and varied discussion on this issue.
Ken Grant moved a motion to make 3 starting blocks for the blue mat area outside the pits and 1 designated starting block for engine tuning in the helicopter paddock. Paul recommended a short safety fence be placed between the starters and the field as the runways are very close.
Ian Clapp to arrange the starting blocks which will be made of metal to replace the existing wooden ones.

Seconded: Larry Allen
Motion carried

viii) Club Logo
There was general discussion on the need for a new logo/wording as well as a sketch that Ian Clapp provided. It was agreed that the designs would be placed in the Propwash to elicit comments from across members.

vii) Old Timers
The issue of the Old Timers competition taking over the field for two days in September restricting its use to a dwindling number of participants was raised by Bob Main. The meeting agreed that if possible there should be a combined club day to allow club members to participate. Ian Clapp to investigate.

Meeting was closed at 12.45 pm
Next Meeting: Sunday 8 June, 2003
Brod

Hints and Tips

- The plastic connection nipples on the remote needle assemblies of some engines (OS40 etc) can be repaired if broken off after a crash by glueing back on with medium cyno. Make sure the fractured parts line up exactly for a strong fit and check the holes are not blocked afterwards by cleaning out with a small drill (be careful not to damage the brass jet!). Clean with meths first then don't clean the excess glue off around the outside of the joint and leave to dry overnight for maximum strength.
- If making engine mounts for 'plastic' planes you must use a high density polyethylene (HDPE) cutting board not low density (LDPE) or other plastic types. Low density types will fracture after a short while and this is obviously very dangerous. Alternatively use a 10 mm plywood bulkhead and a glass filled/metal engine mount screwed on to be safe.
- For small to medium size motors try using mild steel mounting bolts not high tensile (black) bolts as the engine case lugs can break off in a crash. With MS bolts these will (hopefully!) shear first and save your motor casing.
- The inexpensive 4 channel Hitech Focus transmitters are excellent value but lack dual rate switches which are very useful. These however can be added by wiring switches in for less than \$10. The only downside is that you lose the trainer switch and the warranty of course! If anyone is interested then please contact me (*Paul*).
- If you have to run an engine at home sometimes and don't want to annoy the neighbours too much then a useful sound reduction can be obtained as follows; Connect a very short length of 12mm (12mm for 40's - smaller for small engines etc) plastic tube onto the end of the silencer and then push this into a 250 ml 'Pop Tops' fruit drink bottle which has had a 10mm hole drilled in the bottom. Leave the top off the bottle and position horizontally so that it will also collect the oil that comes out of the exhaust. Be careful not to run motors indoors though as methanol fumes are toxic. Better still to run it at the field. Keep the pipe length very short (say 3" max) otherwise you may get too much back pressure which could cause over-heating.
- Once opened, always leave the cap off a CA bottle. Why? The cap is not made of the special thermoplastic the tip is made from and CA will stick to it gluing it in place.
- If you have any tips to share with others then please forward them to me as I'm running out....I'm sure there must be a minefield of information out there. One last tip - never fly into the sun - the plane tends to melt!

Dodgey

Safety Issues and bits from our Safety Officer Bob Main

At the AGM many members raised the issue of safety. In particular concerns were expressed with regard to the starting block area outside the pits. It was agreed by all that this area should only be used for starting models and that once the flight has been completed the model and the starting gear should be returned to the pits (this was always the original idea). Therefore the number of starting restraints has been reduced to four. It was felt that the practice of starting of planes outside the pits is working well but members are asked to co-operate and remove their equipment to the pits ASAP after flying. It is also hoped that we will get a starting unit for all members to use in due course. A couple of people offered to build this some time ago - if their offer still stands this would be most welcomed.

As we have four runways it was agreed that four permanent positions will be marked for the consistent placement of the cone for pilots to stand by when flying. At the moment we tend to have people standing all over the place and this again is a safety issue.

On 11/05/03 some radio interference was noted by a couple of pilots and Larry confirmed this by the use of the Clubs scanner, so please be aware of this (*and always try to do a scan before and during a flying session - Ed*).

Sunday 18th May.

Our new President is fired with enthusiasm and is off to a good start. The weather was not too good for flying however but those that did turn up really got stuck into the work. The shed was emptied right out and a full farm sized trailer load of junk and rubbish was carted off by Ian. The floor was levelled out and quite a few paving slabs were laid. Also the matting was rearranged for the start up area outside the pits. Ian has made some excellent plane start up anchors and these have been installed. Now we will be able to start on the mats instead of on the grass. Members are asked to place their flight boxes onto the tables, over the pit fence, once they have started and before they taxi out so that other flyers can then use the plane restraints.

Many thanks to Ian - I am sure we all support his drive and enthusiasm and thank him for the use of his machinery. Also it was good to see Grant House and Bruce Philp at the field again .

Just a reminder that Club Rules require that only paid up members are allowed in the pit area - unless guests are invited in by a financial member. All visitors should sign the visitors book if they wish to fly and they must of course produce a current MAAA card. It is also expected that people who regularly use our facilities and attend our flying field should at least pay the \$20.00 social membership fee. The new Club House should be delivered next week. Another important expected arrival is another child for Smudge. No doubt he will let us know in due course!!

Bob

PS. The Motor cycle still has a bad oil leak and therefore should not be used. I am hoping to get this under control before long. It has now been in to Bunbury twice to have it fixed and so I am getting a bit cheesed off about it.

Ni-Cad & Ni-MH BATTERY MANAGEMENT CHARGING HIGH CAPACITY BATTERIES

By Ray Datodi

The use of Nickel Cadmium batteries and methods of charging may be found in many technical journals and R/C modelling magazines, it is not the intention of this article to regurgitate all of what has been said before but rather to cover a few of the subtleties often missed when dealing with the subject of Ni-Cd and Ni-MH batteries.

Over the years the load on receiver packs has increased as larger models are being built requiring more powerful servos and in many cases an increasing number of servos. Larger servos and or increasing the number of servos will result in a greater demand on the RX battery pack load capacity. Modellers recognising this fact often opt for higher capacity batteries to handle the greater loads and wisely purchase battery packs ranging from two to three times the capacity of the pack supplied, or recommended, by the manufacturer of the radio system purchased. The only problem in taking that step is in the continued use of the battery charger included in the set at the time of purchase.

You may well ask, "what's wrong with that?" and on the surface there would appear to be little problem in using the original charger to charge the higher capacity RX battery pack. What may not be generally known is that the recommended charge rate for Ni-Cad and Ni-MH batteries is 10% of battery capacity. RX battery packs supplied by R/C equipment manufacturers, generally range in capacity from 500 to 600 milliamp hours (mAH). The charger supplied with the set subsequently would be designed to deliver around 50 milliamp (mA). Many readers would have noticed that the charging instructions stamped on, say a 500mAH Ni-Cad battery state "charge at 50 mA for 14 Hrs." Most manufacturers rate their batteries at the 10Hr rate. That is to say, that a fully charged 500mAH battery pack would deliver 50mA for 10Hrs before being fully discharged. It must be noted here, however, that the charging requirement calls for 50mA for 14Hrs. Due to the inefficiencies in the electrochemical conversion, to fully recharge the battery, an additional 40% (approx) of electrical energy is required to complete the charging process. Another way of viewing the charging requirement is to say that of the 50mA being delivered by the charger approximately 36mA go to charging the battery whilst 24mA are wasted through inefficiencies (The purist chemical gurus among you please forgive the simplistic analogous explanation).

If we now take this approach and consider using the same 50mA charger to charge a battery pack of equal voltage but 4 times capacity i.e. 2000mAH, we would find that to charge this battery from a fully discharged state, using the "useful" 36mA from our 50mA charger, will require $2000/36 = 56$ hrs (approx). The balance of current from the charger i.e. the remaining $24mA \times 56$ hrs, is being burned up in inefficiency. To avoid the protracted charging time, a 200mA charger is required to correctly recharge the 2000mA battery pack. Where modellers have found themselves in trouble is that many have considered and overnight charge as being adequate to restore the battery! Nothing could be further from the truth! The end result is a gradual and ongoing

undercharging of the battery until one day a model is lost. I have seen it happen!

What will further compound the above scenario of the inadequate charging system is the problem of "memory" effect. "Memory" effect is the common term used in describing the reduction in battery capacity resulting from continued partial discharge and incorrect charging of a Ni-Cad battery pack. If a battery is not regularly deep cycled (fully discharged and recharged) crystalline growth and crystal clumping occurs within each cell effectively reducing the overall battery capacity. Battery capacity is a function of surface area of the positive and negative plates in contact with the electrolyte. Crystalline growth and clumping causes a reduction in surface area thus reducing the effective plate area within the cells. An analogous view of the problem is to consider a 200 litre barrel filled with golf balls immersed in water. The total wetted surface area of the golf balls would be representative of the plate surface area of a Ni-Cad cell with the water being the cell's electrolyte. If the golf balls were replaced with basketballs to emulate the effect of crystalline growth, the total wetted area would be greatly reduced reflecting the phenomenon which causes the reduction in cell capacity of the Ni-Cad battery. Deep cycling the battery on a regular bases will reverse the process of crystalline growth and reduce the size of the crystal structure.

The deep cycling approach is the lesser of two evils! If the battery is not deep cycled the cell capacity is reduced by "memory" effect, a very dangerous condition for the R/C flyer, if the battery is deep cycled, then total battery life is reduced! Ni-Cad and Ni-MH batteries are capable of approximately 3000 recycles, unfortunately, deep cycling will reduce the battery life to about 250 to 300 recycles. So how can these shortcomings be minimised? A well known technique called REFLEX charging, has been proven to be the most effective way to charge Ni-Cad and Ni-MH cells. This technique charges the battery by a series of charging current pulses with an intermittent discharge current pulse, obviously there must be more charging than discharging pulses in order to charge the battery. This technique is capable of controlling crystalline growth in new cells and in fact restoring used cells suffering from memory effect, back to maximum capacity for that cell. This charging technique, although simple in principle, does require quite sophisticated electronics to achieve the desired result. For the serious modeller wanting to ensure maximum reliability of their batteries the purchase of a charger offering the above method of battery charging becomes a worthwhile acquisition.

Every now and then one comes across a "little gem". In early 1999 I noticed an advert for a battery charger that seemed to have all the right characteristics, not only did this charger claim the use of REFLEX charging but also incorporated fast charging as a feature (the REFLEX method does in fact permit high current injection resulting in fast charging). An added bonus was that it is Australian made. Being unable to resist the temptation, I purchased one of these units and I must say, was amazed at the results it achieved in not only fast charging but in restoring battery pack capacity. After conducting numerous tests, I was convinced that this charger was without a doubt the best thing that had happened in a long time to R/C modelling.

The model I purchased is one of the early designs requiring a power supply to drive the charger from AC mains or it could simply be connected to a 12V car battery. Since then I have seen some rapid developments in the design, both electronically and mechanically, with added features such as a small switch mode power supply for mains operation and auto sensing of battery voltage thus further simplifying the operation of the unit. Credit must go to Horst Reuter the designer and manufacturer of the microprocessor controlled "Smart Fastcharger" for a very well designed and engineered product. Having been in the electronics industry all of my professional career I am well positioned to evaluate such a product and hasten to add that "Smart Fastchargers" offer incredible value for money. A number have already been purchased in W.A and for those of you interested in the unit I have included a photograph (courtesy Ian Johnson, Conquest Advertising). The photo includes the accessories available with the unit which include a switch mode power supply for mains operation, a battery connect cable for direct connection to a 12V car battery and a cigarette lighter fitting for charging whilst driving.



For further information on this unit contact:-

Smart Fastchargers
 2567 Wilmot Rd.
 Tasmania 7310
 Phone: (03) 6492 1368
 E-mail: smartfastchargers@bigpond.com

DISPELLING THE MYTH OF BALANCING SINGLE CYLINDER ENGINES

by Dodgey

Ever watched someone balance a propeller and curse when the vibration seems to be just as bad or even gets worse? For example my 46LA sounds fine when on full tap/tick-over but at half throttle has a noticeable resonance and causes vibration in the aircraft which can't be good for the radio gear and control surfaces. Changing one (balanced) prop for another didn't make the slightest difference.

The fact is that it is IMPOSSIBLE to dynamically balance a single-cylinder engine. The best that can be done however is a compromise which generally takes the form of counterbalancing the crankshaft by having additional metal in the semi-circle area on the end of the crankshaft around the crankpin. When designing an engine the amount of metal added to the crank for this counter-weight is normally equal to ALL the weight of the lower half of the conrod plus HALF

the weight of the piston, gudgeon pin, and UPPER half of the conrod. The idea of the counter-weight is to transfer half of the up-and-down unbalance of a one-cylinder engine into side-to-side vibration. The "dynamic resultant" of that SHOULD reduce the total vibratory effects by about a third. However, the realm of dynamics isn't quite that simple. Experimentation is the key as each engine is different and sometimes it will be found that an engine will run the smoothest with little or no shaft counterbalancing at all whilst in other engines it will be found that extra weight on the counterweight is the way to go.

Why the variance? Its because every engine is designed differently and also nothing is truly rigid and components can distort, compress, and/or vibrate like a tuning fork given the opportunity. In model engines sometimes these distortions, compressions and/or vibrations can prove beneficial cancelling out some or all of the dynamic imbalance effects or they can be detrimental and cause severe vibrations at different engine speeds.

It is possible by trial and error to use an unbalanced propeller to further balance and enhance the performance of the engine. However using a normal prop balancer will only provide a STATIC balance which gives a very coarse measure whilst a DYNAMIC balance is needed to finish the job off and there's NO WAY you can test and adjust that easily. However by installing an out-of-balance prop on an engine can sometimes produce a noticeably smoother engine giving a smoother performance!

Unfortunately trial and error under operating conditions is the only way to test for this and the easiest way is to keep running the engine using an out of balanced prop at different positions on the crank.

The following method can be used to experiment;

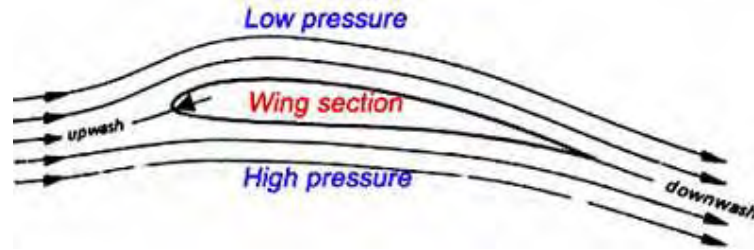
When installing a new prop (after removing all its sharp edges and smoothing its leading edge and tips into a neat radius) slip a loose-fitting steel dowel through the hub hole and use that as a rough-and-ready "balancing tool" to detect a noticeably heavy blade. Start with a balanced prop and note the vibration and then try one that's not balanced and put the heavy blade on the BOTTOM when the piston's at the TOP and then note the vibration. Then reverse the prop 180 degrees and try again. One of these will give noticeable better results and this is probably the best you can do unless you want to start removing/adding weight to the crank which is a tricky business and will probably result in a ruined engine. Once the best position is found then mark the prop in relation to the Top Dead centre of the engine to make sure its always installed that way (until it breaks of course when the process has to be repeated!).

If you can't find an out of balance prop to experiment with then try making one by cutting 5mm or so off of the end of a old prop (I can hear the purists start to scream...) and try that at different positions on the crank.

Always remember though its all about experimenting and trying to make improvements (and also keep life interesting at the same time!) ***PS If you can't 'hear' the vibration then ask for an engine-ear!***

Radio Control Model Gliders

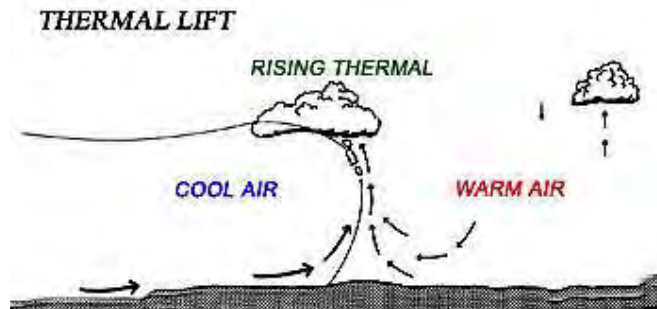
Gliding is the challenge and fun of flying without an engine, using only the pilot's skill and the invisible energy of the lifting air or rising thermal. To stay afloat in the air, the glider wings must provide enough [lift](#) to support its weight. To generate this lift the glider has to travel through the air with sufficient speed. The necessary speed is obtained by gravity together with the mass of the glider itself. In another word the "power" of the glider is its own weight. When the wings move through a stream of air, the top part of the air stream travels at a higher velocity over the aerofoil curve of this top surface than its bottom surface.



The two streams of air will meet again at the trailing edge of the wings. A low pressure develops on the top surface. In another word, the top surface experiences a low pressure while the bottom of the wing surface is at a higher pressure. Therefore, lift is generated to support the wings of the glider. The sinking speed of a glider is the **rate** at which it loses height while gliding. The best glide angle is achieved only when it is flown at the velocity which gives the best relationship of lift to drag. There is a constant loss of height no matter how efficient the glider's performance is in respect to its lift/drag ratio or L/D ratio. If this glider is flown in rising air either in slope lift or thermal lift, and, if this lift is larger than its sinking rate, the glider instead of descending will gain height. This is how a glider flies without an engine.

Thermal Lift

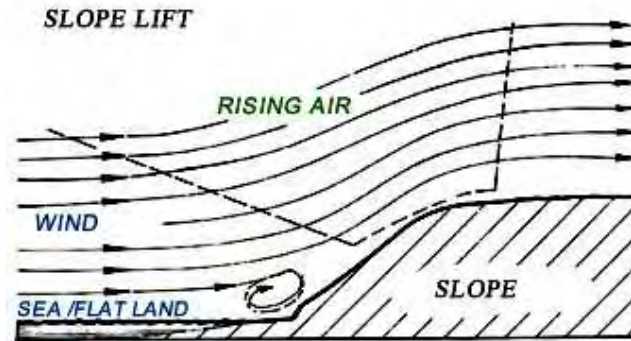
Thermal lift can be found in days mostly when the wind is light and the sun is shining. It is more complicated to appreciate than slope lift. When a mass of air is heated by the sun or other means it becomes warmer than the surrounding air and will rise. It continues to rise, cooling by expansion as it does so. The temperature of this thermal will decrease with altitude above the ground. It will stop rising when the temperatures eventually coincide.



This is the most common type of thermal lift we use in our model flying. There are other phenomena where thermal lifts are found to be generated, but these may not be applicable to our model flying. It is interesting to find that birds are the best thermal lift finders.

Slope Lift

The best and smoothest slope lift is from coastal sites where wind blows over a smooth water surface. It begins to rise as soon as it hits the bottom of the slope. The condition of the lifting power depends on velocity of the wind and shape of the slope. Slope lift can be found starting from about 50% up the slope, as in the diagram below. This is the area of "**RISING AIR**" where slope gliders are mostly flown.



Beginners Models



These are usually of two-function control with high wing location and large dihedral angle construction. They are also called "Trainer's Models". Sometimes this angle can be as large as 10 degrees. Wing spans fall between the range of 1.5 to 2.5 metres. Due to its large dihedral angle it has its built-in self-righting properties or inherent stability, so that it will automatically sort out itself when the pilot is in difficulty with his transmitter controls. In other words, the model when properly trimmed can fly 'hands-off' from the transmitter in case of trouble. These are usually built of light weight construction.

Intermediate Models



These are similar to beginner's models in the sense of rudder and elevator control but usually are of larger wing span, small dihedral angles of 2 to 3 degrees, and high Aspect-Ratio (Span divided by Chord). Due to their high aspect-ratio construction models of this type can be flown in marginal conditions. This provides a big challenge and enjoyment when slope soaring. With wind speeds of 15 to 20 m.p.h. there is no difficulty at all to fly such models. However, at velocities below 10 m.p.h. say 8 m.p.h. much skill is called for.

Semi-Scale Models



These are multi-function control planes which are extremely elegant to fly and they are very efficient rising to great heights in light lift conditions. With their high aspect-ratios and larger wing span, they roll more slowly than the aerobatics models. These characteristics give them an air of majestic serenity and beauty. Their fuselages are more streamlined which make them efficient giving a large 'Lift to Drag' ratio. Models come in from 3 metres to 6 metres sizes. Larger than 6 metres will give problem in transportation and launching without assistants. Examples are the 5-metre [Jantar-1](#) and the ever popular [Ka6E](#) sailplane.

Full House Aerobatics Models



These are the advanced type where three radio functions are the primary controls, elevator, rudder and ailerons. Other optional items can be included such as flaps, spoilers, variable-camber aerofoils and even variable angle of attacks for the right and left wings individually. Models of this type have a shorter wing span for its rolling action, a little swept back for speed, heavy fuselage and light (weight) wings for its concentration of body inertia for axial rolling action. The wing section in general term should be "semi-symmetrical" for upside down performance. Examples can

be found in the ultimate design of [100-Bird](#) model. Landing is easier with this type of models because of the aileron control which can bring the plane level very quickly.



Flying Wings or Tailless Models

Without a fuselage the elevator part of the plane is built-in at the trailing edge of its own wing. The wing has a reflex section which means the trailing edge points a little upwards. They have a forward centre of gravity (CG) and its position is sensitive and should always be in the correct location. Without a known location the initial flight to search the correct CG position is a little tricky. Spoilers/air-brakes, and flaps can be installed. Inverted flights is possible but becomes unsteady for long durations. Rolls, loops and other aerobatics performances are possible. Due to their reflex construction many models flutter at high speed. Once the model is slowed down its stability is regained. The rudder function is required in order to fly in a steady straight path. The installation of these rudders may spoil the design of some flying wings. Some alternative equivalents are installed. For example, the [Cortina](#) has two rudders, or winglets at the tips of the wing. The [Eagle](#) has up pointed feathers for the action of these rudders.



Vintage Scale Models

These are usually of multi-function control models and should be flown at low velocities not to race with one another. With bulky fuselages and gull wings they fly with elegance and beauty providing an enormous pleasure in the piloting of these planes. The [Minimoa](#) and the [Short Nimbus](#) are good examples of vintage scale models.

Treasurers report as at 30/04/03

Receipts		Payments	
Fees	0	Tax	3.30
Soft Drinks	43	Soft Drinks	0
Food	0	Food	0
Debenture Stock + interest	4129.04	Postage	21.20
Total	4172.04	Milk	30.95
		Total	55.45
Bank balance		Assets	
Statement as at 30/04/03	5579.42	Equipment Value	23950
Cash on hand	11.25	Debenture Stock	3000
Cheques on hand	0		
Cheques not cleared	60		
Balance	5530.67		

Dodgey

Stop Press

A guy spent ages painting his scale model in a very realistic camouflage scheme. Unfortunately on the first flight it landed in some bushes and took several hours to locate! Moral of this is to paint everything bright orange – it may not look so good but at least you get to take it home. That's also why wives buy their husbands bright shirts – so they can't lose them when out shopping!