

**NEXT MEETING IS ON
TUESDAY 10th FEBRUARY 2009**

**The Newsletter of WRCS Inc.
PO Box 349
Brookvale NSW 2100**

**Warringah Radio Control
Society Incorporated**
(Incorporated under the Association Incorporation Act 1984)



NEWSLETTER

DECEMBER 2008



After much debate about the chances of a successful landing following the shedding of a wing, Tom Sparkes decided to put it to a practical test and his model sustained minor cosmetic damage.

Result: INCONCLUSIVE.

CHRISTMASPARTYCHRISTMASPARTY
The Christmas Party will be held on Saturday,
13th December 2008, entry by ticket only.

MEETINGSMEETINGSMEETINGSMEETINGSMEETINGS
The next meeting will be held on Tuesday, 10th
February 2009 at Tennis Cove, Eastern Valley
Way, starting at 7.30 pm.

**POSTAGE
PAID
AUSTRALIA**



THANK YOU

On behalf of WRCS, I thank this year's contributors to the Mag:

Colin Buckley	Mike Minty
Ron Clark	Vaughan Ooshuizen
Peter Coles	Brian Porman
David Cotton	David Pound
Peter Donnan	Doug Radford
Kevin Einstein	Dean Schuback
Grant Furzer	Colin Simpson
Stephanie Grech	Tom Sparkes
Geoff Green	Chris Venter
Stephen MacMahon	Clive Weatherhead
Jim Masterton	Garry Welsh
David Menzies	Mannie Wides

In particular, thanks to those who have contributed regularly .
On behalf of the Committee , the CFI's and myself, I wish all our Members the compliments of the Season and may your stockings be filled with lots of goodies.

I'll see you in 2009!!
Tom (Newsletter Editor)

Warringah Radio Control Society Inc.

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WRCS CHRISTMAS PARTY



By ticket only!!! at 4 pm
on **SATURDAY 13th December**
lots of yummy food, dinner served at 6pm.
Adults \$25;
Children 5-10 \$10;
under 5 - FREE

RAFFLE - tickets \$5 ea.

Prizes: 1st Extra ARF for 120 size engine
2nd Hellcat ARF for 90 engine
3rd Spectrum 5 Transmitter with receiver.
(donated by Model Flight)
4th 3.8 litres Oil
5th 15 litres Methanol
Christmas Party door prize:
\$100 voucher for Hobby Heroes
AND MORE!!

Contact Warren Lewis at the field most Saturdays or by phone 9417-5853(w) or 9417-0269(h) or send cheque (made out to WRCS) and a stamped self addressed envelope to:



Warren Lewis
61 Headland Road
Castle Cove NSW 2069

VALE

We have received the sad news that one of our members,

ERIC COHN

lost his life in a parachuting accident recently, although the exact circumstances of his tragic passing are not known. Eric joined the club about a year ago and was 49 years old when he died. We offer our sincere condolences to all his family and loved ones.



CONGRATULATIONS

to **PETER WYSS**

on achieving his
HELICOPTER GOLD WINGS



The 2008 Club
Championship programme
is now completed

CONGRATULATIONS TO **AL ZUGER**

the 2008 Club Champion
Runner-up: David Foster
Third: Tom Sparkes

To see the full results please visit the Club's Webpage.
We thank **Dave Pound** who co-ordinated all the events throughout year, and our thanks also go to everybody who assisted Dave with his task.

Picking a Prop

By **Don Hart** (from "Ridge Runner", June 2003)

(Permission to re-print arranged by Clive Weatherhead)

I was leafing through some of my old Model Airplane News issues and ran across two articles by Andy Lennon on techniques to match your prop to the engine and airframe. He has some interesting ideas on how to go about selecting a prop. You've probably noticed that engine manufacturers often have horsepower ratings in their ads – something like 1.89hp at 18,000rpm. This sounds impressive until you realize that this statistic, while true, was probably on a 46 two stroke running a 9x4 prop. Andy Lennon would like to see the engine manufacturers list the rpm at the maximum torque, a much more useful statistic.

If you've seen the hp and torque curves in a typical r/c sport engine review, you've noticed that the rpm for maximum torque is well below the rpm for maximum hp. High performance engines intended for racing are the exception.

Engines such those from Jett and Nelson may have both maximum hp and torque at about the same rpm, some where in the 16,000 to 19,000 rpm range.

According to Lennon, it's torque that turns your prop. He suggests that you pick a prop that will load your engine near the rpm where your engine delivers maximum torque.

Not only will you get the most from your engine, a larger prop is more efficient, giving you better performance.

Of course, if you run your engine with too large a load, you risk damage from overheating, especially if your plane has a cowl.

Think about how much air your prop moves – this is the thrust that moves your plane.

A way to compare props is to calculate the volume of air per minute. You probably remember the formula for calculating the area of a circle:

$$\text{Area} = \pi \times \text{radius-squared.}$$

Pi is roughly 3.1416. We want to use diameter (d) rather than radius, so the formula becomes:

$$\text{Area} = 3.1416 \times \text{diameter-squared} / 4.$$

Factor in the prop pitch and rpm and do a bit of algebra, and Lennon ends up with a formula for:

$$\text{volume of air per minute} = \text{diameter-squared} \times 0.7854 \times \text{rpm} \times \text{nominal-pitch}$$

For a APC 10x9 prop at 10,710rpm, the air volume is:

$$10 \times 10 \times 0.7854 \times 10,710 \times 9 = 7.57 \text{ million cubic inches per minute}$$

A computer spreadsheet should allow easy comparison of props. Lennon has a table for four two stroke engines on props that load the engines near their max torque rpm and max hp rpm:

MDS 46

High torque rpm is 10,710 on a 10x9 prop. Air volume is 7.57 million cubic inches per minute.

High hp rpm is 17,900 on a 9x4 prop. Air volume is 4.55 million cubic inches per minute.

SuperTigre G90

High torque rpm is 7,060 on a 14x14 prop. Air volume is 15.21 million cubic inches per minute.

High hp rpm is 14,180 on a 11x7 prop. Air volume is 9.43 million cubic inches per minute.

Webra Speed 120 on a tuned pipe

High torque rpm is 9,139 on a 14x14prop. Air volume is 19.69 million cubic inches per minute.

High hp rpm is 10,484 on a 15x8 prop. Air volume is 14.82 million cubic inches per minute.

Irvine 150

High torque rpm is 5,290 on a 20x10 prop. Air volume is 16.61 million cubic inches per minute.

High hp rpm is 9,280 on a 15x8 prop. Air volume is 13.11 million cubic inches per minute.

As you can see, in all cases the larger prop at the max torque rpm moves lots more air, giving much more thrust than the smaller prop at the max hp rpm.

Lennon states that tuned pipes increase both torque and hp, explaining why pattern and speed fliers use tuned pipes.

Lennon also gives an example of practical application of this information.

He had two buddies, both flying planes powered with the ST G90 engine.

One was a pattern ship, and the other was a 700 square inch P-47. They were both using 13x6 props running between 11,000 and 13,000 rpm.

Lennon talked them into using larger props to get the engines loaded nearer max torque.

The pattern flyer found that a 16x6 gave him excellent performance at moderate speed with much lower noise levels.

The scale flyer found that a 16x8 gave the best performance on the P-47 with improved climb, shorter takeoff and a low reliable idle. One problem with a larger diameter prop can be restricted ground clearance. You may have no choice but to increase pitch rather than diameter.

Dave Gierke, another contributor to Model Airplane News, came up with the "propeller load factor" or PLF. This is calculated as

$$\text{PLF} = \text{diameter-squared} \times \text{pitch}$$

The advantage of PLF is you can determine different sizes of props that should put about the same load on an engine. Here are some examples from Lennon's article:

$$14 \times 14 \text{ PLF} = 2744$$

$$15 \times 10 \text{ PLF} = 2250$$

$$16 \times 10 \text{ PLF} = 2560$$

$$16 \times 8 \text{ PLF} = 2048$$

$$16 \times 12 \text{ PLF} = 3072$$

I calculated a few more:

$$9 \times 4 \text{ PLF} = 324$$

$$10 \times 6 \text{ PLF} = 600$$

$$11 \times 7 \text{ PLF} = 847$$

$$12 \times 6 \text{ PLF} = 864$$

$$13 \times 6 \text{ PLF} = 1014$$

$$16 \times 6 \text{ PLF} = 1536$$

Let's say a modeler has a 46 two stroke that gives max torque at 9,800 rpm.

A light-weight, slow plane should use a large diameter, lower pitch prop.

A heavy-weight, fast plane might use a smaller diameter prop with greater pitch to match the flying speed.

To get the same prop loading factor on the two planes using the same engine, the light plane might fly very well on a 12x6 with a PLF of 864 giving 9,700 rpm.

The heavy plane might fly best on a 10x9 with a PLF of 900 giving 10,700 rpm.

Here are some torque and rpm statistics that Lennon got from past MAN engine reviews.

Four stroke engines:

Enya 41	max torque rpm = 10,300
Saito FA50	max torque rpm = 11,500
OS FS61	max torque rpm = 9,000
Enya 80	max torque rpm = 8,000
OS FS90	max torque rpm = 7,200
Thunder Tiger 91FS	max torque rpm = 6,850
OS FS120 Surpass	max torque rpm = 8,333
Saito 150	max torque rpm = 4,993
Saito 100 Flat Twin	max torque rpm = 6,500

Two stroke engines:

OS 10 FSR	max torque rpm = 11,000
OS 25 FSR	max torque rpm = 8,000
OS 32 FSR	max torque rpm = 7,548
Thunder Tiger 36	max torque rpm = 9,800
Nelson 40	max torque rpm = 18,500
OS 40 FSR	max torque rpm = 9,000
MVVS GES/R 40	max torque rpm = 13,100
Tiger Shark 40	max torque rpm = 7,900
SuperTigre 46	max torque rpm = 8,223
OS 46 FX heli	max torque rpm = 9,000
Sport Jett 46	max torque rpm = 15,850
MDS 46 ABC	max torque rpm = 9,798
Enya 60X ring	max torque rpm = 9,800
Webra Silverline 60	max torque rpm = 6,900

ASP 61	max torque rpm = 4,645
RJL K60	max torque rpm = 9,500
Fitzpatrick 61	max torque rpm = 8,100
Fox Eagle 74	max torque rpm = 9,600
SuperTigre G90	max torque rpm = 5,923
Webra 120	max torque rpm = 6,745
OS 140 RX	max torque rpm = 8,677
DA 3W-24	max torque rpm = 5,880
Irvine 150	max torque rpm = 5,500
Moki 180	max torque rpm = 4,600
Zenoah G38	max torque rpm = 5,040
Zenoah G45	max torque rpm = 5,500

If you're lucky you can find a review for your engine, with torque and horsepower curves, and rpm readings on props of several sizes.

If not, you can use a review of an engine of the same displacement as a starting point.

A tachometer will help you find a prop that gets you near to the right load for maximum torque. PLF calculation can be used to find other props with similar load factors.

This will narrow the range of props to try on your plane to give the best performance. Rpm will increase at flying speed as the prop unloads, so static thrust is only a starting point for optimum prop selection.

Of course, your mileage may vary depending on the weight, drag and wing area of your plane, as well as fuel, air temperature and humidity.

Make sure your engine is well broken in on the recommended low-load prop before loading it for high torque performance.

Good luck with selecting that optimal prop!

Sources:

"The Right Combination" by Andy Lennon, Model Airplane News August 2000

"Choose the right prop for your engine" by Andy Lennon, Model Airplane News June 2001

WRCS SCALE DAY, OCTOBER 2008

Pictorial report by Peter Donnan

These photos were received too late to be included in last month's Mag where a full report of the event was published, but we are sure you will agree that it was well worth the wait!.



L - R: Stan Begg's Bronco landing; Grant Furzer's Tupolev "Bear" just before it crashed; Colin Simpson's Zero landing



L - R: David Menzies' electric Cub; Bob Flint's Bell helicopter; Tom Sparkes' Comet landing; Ron Clark's GeeBee landing



L - R: Peter Sharpe's Skymaster landing; David Foster's exquisite Sopwith Camel; Doug Radford's Avro Avian and Doug being presented the Perpetual Trophy by David Pound, the 2008 Competition Co-ordinator.

Fun Fly 15 November 2008

Report by Mike Minty

A fine day except for the wind which, while not dangerous, was a bit gusty and variable in direction. By 10.00 am the contestants were ready to start though Clive had already managed to lose a plane in the bush on a test flight!

The Contest Director, Mark Connor and the Flight Line Director, David Pound outlined the rules to the crowd (at this point it must be noted that crowd in this context means the 5 competitors – where were the rest of you?) and it was time to fly! With so few entrants it was decided to just have 2



classes, Electric and IC powered. In the former group there was Al Zuger, Dean Schuback and Mark Connor and in the latter Mike Minty, Al Zuger, Mark Connor, Matt Dean and Clive Weatherhead. You could do the events in any order and many chose to do the “Loops in 20 secs” first as it is pretty easy and a nice one to calm the nerves. Al was highest score in IC with 11 while Dean did best electric with 10.



Mike was the first to try the notorious “Climb for 20 seconds and then do as many spins as you can” and proceeded to do exactly the same as he did in this event about 10 years ago – 11 spinsinto the bushes at the end of the field! It was an easy retrieval with little damage but Al was not so lucky.

His 17 spin descent took him very near to where Mike went in but the plane vanished – possibly in the dam! Mark learned from this and got great height out of his Sky Raider and did 23 spins with no mishaps – the highest score in IC class. Dean’s Me163 spins so fast it is impossible to count them and Al scored highest in electric with 20!

“Spot Landing” proved interesting, Dean managed a thumpy one, and not too close, for his first and the canopy flew off his little electric Me 163. Mike managed a very respectable 7 “feet” away, measured by David Pound and his feet! As people practised the distances got smaller, Matt’s 3.5 feet looked hard to beat and then Mark did 3 feet. Clive flew over the spot many times but didn’t seem to notice.

Al did some uncharacteristic heavy landings in his attempts but it was Mark’s little electric 3D plane that proved the best almost hovering into the spot, he and Dean finished equal closest at only 1 foot. Speaking of “Hovering” that event proved interesting too as some of the planes clearly were not designed for it. Mike managed 5 seconds compared with Clive’s 14 secs, Matt struggled with his Stick but then got 16 secs and Dean’s just fell off sideways, but Mark got 10 secs in electric.

“Roll, loop, Cuban 8. loop and land” in the shortest time saw lots of attempts and gradual decrease in times. The hardest part is slowing down after the manoeuvres and lining up for landing without taking too much time. That’s where the little electrics show well and the heavier IC planes have too much inertia. Al’s 18.34 secs just beat Mark’s 18.71 sec for the best electric time; and Mark got the best in IC at 37 secs.

“Limbo” is always an interesting event, the tape seems so high and the poles so far apart until you get to fly! Dean was first up and zoomed back and forwards with great finesse!



Mark clocked up 5 passes in the 2 minute slot and then was pipped by Matt who got six but on his last one, touched the ground, flipped and broke the engine mount. It looked like Mike would beat that but then he clipped the top of one pole with his prop taking off about a foot of it. When it was fixed he continued but only got to six so they shared the highest score in IC. Clive decided to do it fast! The first pass he screamed over the tape to cries of "slow down!" from the crowd! The second pass he dived at speed and hit the ground a foot in front of the tape! The wings of his Magic shot up in the air, the fuselage shattered and spread itself across the field!

Al put on an interesting display with his tiny electric Christen Eagle including bouncing off a pole and still going under the tape but it was Mark again with 10 for the highest in electric!

"Prop in a bucket" saw the usual rush for a prop, a fumble to fit and 3 quick circuits flown by the IC planes which Matt won. Eventually it was time for David and Mark to sit down and add up points to give:-



- IC Powered:**
- 1st Mark Connor
 - 2nd Matt Dean
 - 3rd Mike Minty
- Electric:**
- 1st Mark Connor
 - 2nd Dean Schuback
 - 3rd Al Zuger



Thanks as always to the organisers and to Chris – a guy who came to watch and did lots of timing.

Not a good turn out of members but those who came had a good time!

What about YOU next time?

COLUMN 9.9

(incl. GST)



Our Website was out of service for some days in early November due to the server's equipment crashing. We have received an apology from the host service provider for the inconvenience caused to members.

A "mud map" of the proposed drainage scheme which it is hoped (but not guaranteed) will intercept the water seepage from the south ridge to the "Spring" area was discussed at the November meeting. An estimate of somewhere between \$6000 and \$7000 is expected, but has yet to be confirmed by at least 2 contractors asked to bid. Work is now not expected to be until the first half of next year.

2009 COMPETITION PROGRAMME

- Thermal & Electric Glider Day** - Sunday, February 15
- Combat Day** - Sunday, March 15
- Scale Day** - Sunday, May 17
- Biplane Day** - Saturday, June 20
- Race Day** - Sunday July 19
- Pattern Competition** (not part of points score) - TBA, the field will be closed this weekend to all other flying
- Helicopter Day** - Sunday, August 16
- Garigal Cup** - Sunday, September 20
- Scale Day** - Sunday, November 1
(Special Theme TBA)
- Fun Fly** - Sunday, November 15

David Pound will continue in his role as the Competition Co-ordinator

Goodwood Revival 2008

Report by David Cotton

Goodwood Revival '08 was held the 19th- 20th-21st Sept. near Chichester, Sussex UK. This annual event is the most authentic motor race meeting in the world for pre-1967 cars and includes an Aircraft Display.

For this year the recently restored Avro Vulcan Bomber (XH558) was to have made a flypast but was unable to do so due to engine problems.

The Battle of Britain Memorial Flight by the Lancaster (PA474) with a Spitfire and Hurricane in formation is a sight to remember, the Lancaster is one of only two in airworthy condition out of the 7,377 built.



The Memorial flypast took part on the Saturday and Sunday.

Each day there was an air display by a Spitfire and a Mustang then a display by a 1939 Curtiss 75 Hawk; a 1941 Warhawk P40B and a 1945 Corsair FG1D.

The Supermarine Spitfire displays were by a 1943

Mk IX and a 1945 Mk XIX. There were 4 air displays each day plus the Memorial flight on Sat & Sun. To see these aircraft doing aerobatics at low altitude is spectacular and the awesome noise is something else.



Vickers Vimy replica for the 1994 reenactment of the 1919 flight



The "Freddie March Spirit of Aviation" is a Concours d'elegance for rare and original pre-1966 aircraft that fly in for the event



The Goodwood circuit of 2.38 miles was built around the Westhampnett airfield which was a Spitfire base during WWII (Douglas Bader was based there)





Goodwood was used for motor racing from 1948 to 1966 when it was owned by the Earl of March.



If you ever get the opportunity to go I can highly recommend it



Last month's article about the helicopter camera to find Stan Begg's downed model reminded me about this cartoon from an old issue

