



Torque Back

The news letter of the Hobart Model Aero Club Inc.

Part 2

Are you getting pushed around or pulled along?

Mystery of the Propeller.



25th April 2012



www.hobartmodelaeroclub.org.au

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Tomboys

LMAC

17th March 2012

By:- George Carnie

On the day the northerners got a run for their money by members of the HMAC. Read more about it below;

As can be seen from the table below, I'm not sure we can call this a "Tomboy" event anymore because as you can see of the 11 entrants only 3 were actually Tomboys! However, as always there was plenty of banter and ribbing between competitors and spectators alike. The inter-club camaraderie is always a highlight and we can thank this very low key event for achieving this. Unlike the last few Tomboy events, there were no fly always that I can recall - it seems the message is getting through to all the free flighters to switch on! CD Will Deal also made it very clear before the launch with a stern reminder "Is everybody switched on?". At times we wondered if that was in reference to the radio or a challenge as to the pilot's mental state! Anyway, four rounds were flown, all before lunch and the clear winner of the "Diesel Tomboy's" was Terry Pearson with an aggregate score of 27.99 followed by a trifecta of HMAC entries; second Peter Allen (23.25) who narrowly pipped third place getter Tony Gray (23.12) and then there was a fair gap to fourth placed Mike Rutledge (15.16). Scoring was based on climb and glide (approx 2m motor time) with a maximum duration of eight minutes. The scoring table is below.

| DIESEL "TOMBOY'S" | | | | | | | | |
|-------------------|----------------|------|--------------------|---------|---------|---------|---------|-------|
| Place | Competitor | Club | Model | Round 1 | Round 2 | Round 3 | Round 4 | Total |
| 1 | Pearson, Terry | LMAC | Sportster - MPJ | 6.50 | 8.00 | 6.25 | 7.24 | 27.99 |
| 2 | Allen, Peter | HMAC | Tomboy - MPJ | 6.30 | 6.20 | 5.38 | 5.37 | 23.25 |
| 3 | Gray, Tony | HMAC | Cardinal - MPJ | 4.10 | 7.00 | 6.50 | 5.52 | 23.12 |
| 4 | Rutledge, Mike | HMAC | Courtesan - MPJ | 4.20 | 4.55 | 4.03 | 2.38 | 15.16 |
| 5 | Hay, Kevin | LMAC | Sportster - MPJ | 4.05 | 3.55 | 3.45 | 3.10 | 14.15 |
| 6 | Cameron, Merv | LMAC | Sportster - Merlin | 4.20 | DNS | 5.15 | 3.50 | 12.85 |
| 7 | Cameron, Owen | LMAC | Tombster - Merlin | 4.05 | 3.20 | 2.52 | 0.40 | 10.17 |
| 8 | George, Jason | LMAC | Sportster - Merlin | 4.10 | DNS | 2.45 | 3.03 | 9.58 |
| 9 | Klimeck, Chris | LMAC | Tomboy - MPJ | 1.40 | 2.20 | 2.25 | 3.42 | 9.27 |

Whilst electrics and diesels all flew in the same rounds, it is only fair to keep them separate from a competition point of view. The Electric's was a no contest with Greg Robertson's "rocket" blitzing the rest of the field (me) scoring the maximum in all rounds except the third round. Not many electrics around with Jacques, Geoff and Doug away. So effectively the "Electric" Tomboys was a non-event.

| ELECTRIC "TOMBOY'S" | | | | | | | | |
|---------------------|-----------------|------|----------------------|---------|---------|---------|---------|-------|
| Place | Competitor | Club | Model | Round 1 | Round 2 | Round 3 | Round 4 | Total |
| 1 | Robertson, Greg | LMAC | Sportster - Electric | 8.00 | 8.00 | 6.17 | 8.00 | 30.17 |
| 2 | Carnie, George | LMAC | Tomboy - Electric | DNS | DNS | 3.58 | DNS | 3.58 |

Cover :- Nils Powell's War bird - FW190

Gallipoli:- <http://www.adelaidenow.com.au/gallipolis-food-fight-in-trenches/story-e6frea6u-1226158439781>

In honour of those men who made the ultimate sacrifice. Lest We Forget. For 25th April ANZAC day 2012 Ed.



Real !! dog, what a stupid question of cause I am a real dog. Who the hell are you? Am I supposed to know you? And yes, as a matter of fact I can fly. Now get going or I will come flying after you and shoot you down



Are you famous? Do you know who I am? How come I haven't seen you down at the studio? So Jasper. You think your a real dog huh?? Can you fly, I can? Do you know Charlie Brown ?? He and I go back a long way.



Tomboy Duration Event

15th April 2012



Round 1

Heat 1:

| Competitor | Model | Late Start | Flight Time | Landing ¹ | Corrected Time |
|----------------|-----------|------------|-------------|----------------------|----------------|
| Peter Allen | Tomboy | - | 4:17 | - | 4:17 |
| Mike Hawkins | Simplex | - | 3:02 | - | 3:02 |
| John Jongbleod | Tomboy | - | 5:02 | -30 | 4:32 |
| Geoff Leverton | Pirate | - | 3:30 | -30 | 3:00 |
| Mike Rutledge | Cortesain | 3 | 6:00 (6:42) | - | 6:00 |

Heat 2:

| Competitor | Model | Late Start | Flight Time | Landing ¹ | Corrected Time |
|------------------|--------|------------|-------------|----------------------|----------------|
| Mike Van Niekerk | Tomboy | - | 1:41 | - | 1:41 |
| Chris Rowe | Tomboy | - | 1:52 | - | 1:52 |
| Tony Gray | Tomboy | - | 1:25 | -30 | 0:55 |
| Ross ? | ? | DNS | | | 0:00 |

Notes: 1 – 30 seconds deducted from final time if model did not land on the strip.

Placings:

- 1st – Mike Rutledge
 2nd - John Jongbloed
 3rd – Peter Allen



The Cortesain does a lap of honour.



You go first... Nah, go on you go..



Go on.. Start ya bugger, start



Two Masters face off



Ferw !! On the ground safely

Look at me.. Look at me...

No, forget the pilots, look at the models Ed.



FIELD TALK

Mike Rutledge

Details of the Edge 540T that I test flew today are:

- ARF 1868mm from Hobbyking (AUS Warehouse)
- RCG 30cc Gas Engine also from Hobbyking (AUS Warehouse) 30:1 mix ratio 2-stroke fuel
- TCF 19 x 8 Carbon Fiber Sport Propeller also from Hobbyking (AUS Warehouse)
- All up weight came to 5.8kg.
- The Pitts type wrap around muffler from DL Engines Aust. is fitted with DLE-20 silencers which takes out some of the "Bark" of the petrol engine.
- The setup includes an Ignition UBEC and Kill switch which optically isolates the ignition from everything else.
- JR 2.4GHz Radio with 9Ch Orange Rx

She is a real "Pussycat" in the air and flies well on quarter throttle!

The noise level from 3 metres was 93.5db.



Greg Hall with his new Tomboy 38, engine:- MPJET.

As you can see Greg has a smile on his face. This is a good indicator that the first flight was successful. :-)



Above : Phil Harrington's, F117

The F-117 is from Hobby King. It's made from EPS and is wearing 'desert storm' camouflage. It's powered by a 68mm ducted fan, running on a 3S 2200 mAh LiPo battery.

| | | |
|---|-------|--|
| McCANN'S MODEL WORLD Mon to Fri : 9.00am - 5.30pm Sat : 9.30am - 12.00 noon | | (03) 6234 9011 139 Elizabeth St Hobart |
| Parkzone Spitfire ix PNP | \$275 | |
| Midwest Electric Hots kit e/ic | \$220 | |

Member's Models

Sorry to the owner's Peter hadn't given me any information on them at all, but you know who you are :-)

Ed.



The Prop-per Approach to Props

By :- Nils Powell

Many and varied are the opinions on prop selection so what follows is about props for those of us with an urge to understand what considerations underline selection. If you find something you'd like to add, or disagree with, write it down and have it published for all to benefit.

First, on limits applicable to any prop irrespective of what model is to be used.



Tip speed - the limit here is noise and inefficiency which both have their origins in a common cause. You cannot just go on increasing rpm in the search for more speed or performance unfortunately. The tips of prop blades can reach very high speeds and may approach the onset of compressibility problems (ie approaching the speed of sound - Mach 1 - when air progressively stops acting under the rules of fluid flow.

Every time a prop blade rotates with the model not moving forward, it travels a distance of 3.14 its diameter so a 14" dia prop for example travels about 44" per turn which may not sound like much but when it does this 10000 times a minute it actually travels around 7 miles in that minute which incidentally is $M0.6$ or about 430mph. (all this using my pretty rough mental arithmetic) Compressibility effects come into play at about $M0.75$ with tips becoming gradually more inefficient and noisier the closer to $M1$ they get so if we push up the prop speed to 12K rpm ($M0.7$) we are approaching the compressibility regime.

An interesting aside here - NZ used Harvards as intermediate trainers in the 50s and 60s. which when climbing out or in fly pasts in fine pitch and full power made a truly dreadful noise, a harsh racketing sound that was disturbing for anyone anywhere near the airfield.

After a prop was damaged in a tip strike away from base the engineers trimmed off the damage, shortening the blade to allow the aircraft to be flown home. Turned out the Harvard's performance was slightly improved at full power, and the noise significantly reduced with the added benefit of reducing ground strikes, so all blades were trimmed as far as I know. That was the first time I'd come across compressibility problems on props.

The good news, in general flying at these RPM limits lie above the normal RPM / diameters used on piston engined models but some elec motors especially with KV ratings above 1000 revs per volt may well enter this range. So in general, tip speed is unlikely to be a consideration unless a prop or motor combination is noisier than expected or performs below expectation when accompanied by relatively high rpm. Should this situation arise tip speeds need to be calculated and ensuring they come out at something under about $0.75M$.

The next consideration is prop efficiency. As stated, tip speeds above $M0.75$ result in progressive performance loss but also it is generally considered that the ideal pitch / diameter ratio is from about $0.6:1$ to $0.75:1$ for peak performance and is another area affecting prop selection. Special props may well go outside this but for most of us these are good figures to aim for. Translated this means, for example, a 14" prop should be operated with a pitch somewhere between 6" and 10". This is not critical but a figure around which you could expect the most efficient performance. If you have to stray outside this then using another diameter may have to be investigated.

These two considerations go some way to determining what prop to use in that if tip speed is too high the diameter can be reduced and the pitch increased to allow the same loading and at the same time if you choose a pitch figure then the diameter should be such that the P/D ratio is acceptable.

This statement brings up load factor calculation. The simplest I know of (and there are several) is $2xD + \text{pitch} = Lf$



Now Lf is just a figure and has no substantive value but if used consistently does give a comparison between prop sizes and their load on the motor that enables valid changes. To take an example - say with a 14x6 prop you find that max rpm is 7Krpm and you would like to get over 9000rpm. The 14x6 has a Lf of 34 then an 11x8 prop with a Lf of 30. should give a reasonable rpm increase along with improved airspeed. Or perhaps you'd like a bit more speed but keeping the current rpm. The 14x6 Lf is 34 so a 13x8 gives the same Lf and should keep the motor in the same speed range.

Another consideration is the type of prop. This selection includes the choice of two or three blades. There is a common perception that two blades are better (more efficient) than three, a gross generalization, almost impossible to sustain. There are too many variables, if you look at 2 and 3 bladed props (see illustration) you will see that they are of quite different shape so that a direct comparison size for size is impossible.

It's often said that three blades operate in air already disturbed by the preceding blade which is of course closer than when using two blades. This may be true when stationary but hardly applies with a model in moving forward at any reasonable speed, when the blades on any prop would actually be traveling in undisturbed air.

I looked up test data from one manufacturer and found that for props of the same nominal size, there is an 8% increase in loading with 3 blades. The Windsor Prop Co (Master Airscrew) recommend that if changing from 2 blades to 3 the dia should be reduced by 1" and the pitch increased by 1". I know from personal experiment that 3 blades produce little observable change in performance but do allow for better ground clearance if reducing dia and smoother running. Where it gets confusing are statements along the lines "I always use Super props over Joe Blogs props because they give better rpm". Now this may well be true but among variables is the way pitch is calculated and this alone may account for any variation.

Where two bladers do win out is on cost and availability. In general they are cheaper and available in a much wider range of sizes. The big drawback from a personal perspective is the look of two blades on a model where the full size aircraft would normally have either 3 or 4 blades.

By way of a rough test I ran one of my electric models on two and three bladed props with exactly the same nominal pitch / diameter from the same manufacturer and measured the current draw. It was hard to see any difference, the current was near enough 66A for both at full power and produced as far as tachometer observability was concerned, the same RPM. Now I'm well aware this is not a definitive test but I was curious to see if I could see any difference and the answer was - no!

To be continued.



Hobart Model Aero Club Inc. Nomination Form.

I hereby nominate

For the position of

Nominated by:

Signed..... Date.....

Name.....

Seconded By:

Signed..... Date.....

Name.....

Nominee:

I agree to accept nomination for the above position.

Signed..... Date.....

Name.....

To be returned to the secretary by 7th June, 2012.

For Sale

1/5 Scale Fokker DVII

OS 60 engine, Hitec radio gear
All reasonable offers considered.

Contact: Bryce 0417 127 945
bryce_atkinson(at)netspace.net.au



Zagi wing

OS25, Hitec radio gear.

Goes like stink!

All reasonable offers considered.

Contact: Bryce 0417 127 945
bryce_atkinson(at)netspace.net.au



IR Receivers - NER-549X

9 channel, 36MHz, 2 of, \$45 each

Contact: Stuart 6247 7423



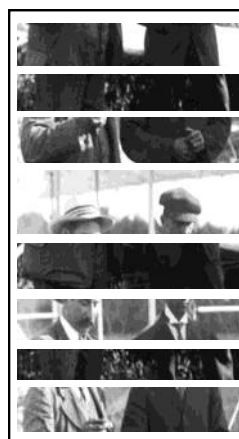
Wanted

Electric starter motor for the club trainer

Is there anyone in the club that feels generous enough to donate a disused electric starter motor (for 60 size) that they have no use for?



Puzzling Torque



That's right it was the Wright Brothers, Orville and Wilbur Wright