# Torque Back

The news letter of the Hobart Model Aero Club inc.

Part 1


# On a String

## Coquette and a Prayer

## A Controline special

**Big ship performance in .09-powered stunter resulted from this designer's need for an "apartment-sized model." Mac Diesel does it.**

When the McCoy "9" Diesel was marketed, we saw the possibility of using the motor to good advantage in an "apartment-sized" model. Since our interest is primarily with stunt flying and space restrictions prohibit the building of a large stunter, the Diesel seemed to be the ideal answer to our problem.

Our first few flights were with the Diesel running rich and the model flew all but overhead eights. When the motor had had sufficient running time, we leaned the needle out and found that we had a superb stunter which flew everything as well as a big job, which speaks well of the smaller 230 sq. in. wing.

Wing and Stab

First join the plan drawings at XX to give the full wing layout. Cut out and cement all ribs (med. 1/16 in. sheet) to the lower hard 3/16 in. sq. spar, noting that the left wing panel is longer than the right. Now block up the rib ends and cement the top spar in place. Cut out and cement the med. hard 3/16 in. sheet trailing edge in place. Add the hard 3/16 in. sheet leading edge and the med. soft 1/16 in. sheet top LE covering, dampening the latter if necessary.

Be careful at this point to keep the wing structure in alinement. Next add tip support W4; tip pieces W5, W6, W7; tip sheeting and the upper and lower cap strips. Install the 3/32 in. plywood bellcrank mount (W8), support W9 and the 2 in. bellcrank. Thread 1/32 in. dia. leadout wires through the holes in the left wing panel and anchor the root ends to the bellcrank. Now install the 1/16 in. dia. pushrod and cover the wing center section. Shape the LE, TE and tips to the sections indicated. Sand wing quite smooth.

Cut out the stab and elevators from med. 3/32 in. sheet and sand them to shape. Cement the elevators to a length of 3/32 in. dia. dowel, then hinge this assembly to the stab with 1/2 in. wide strips of cloth and bolt the elevator horn in place. Cement the stab to the fuselage sides, then add the front portion of the R2. Note that the latter is offset 1/8

(Continued on page 47)

Compare this picture with the plan for such things as the wing cross-section—again one of the niceties of stunt design. Go for that profile?


**And all the usual stuff..**


Still only 1/

www.hobartmodelaeroclub.org.au/

April– May 2012 Vol. 12 No. 02

# Torque Back

The news letter of the Hobart Model Aero Club inc.

**IN THIS ISSUE—part 1**



**IN THIS ISSUE– part 2**




**From the Editor.**

**For future features or other suggestions please contact me as I am putting in things of interest to a broad range of topics I think. If you do have a suggestion or a gripe just contact me, I don't bite (much ha ha ha).**

**Graeme 6228 9418 or 0417 520 970 or email gels@netspace.net.au.**

**Next Issue**

June—July


**How lift is generated**

Front cover cartoon:- "Chicken Wings Aviation Comics" www.chickencomics.com. Article on the cover was written by Dick Carlson date ??

# Cockpit Torque cont...

**2012 Annual General Meeting.**

The 2012 Annual General Meeting will be held at Kelly Field at 10.00 am on Sunday 17th June 2012. The Annual General Meeting will be followed by a General Meeting.

There will be an election of the executive and the committee.

The President, Vice President, Treasurer, Secretary and one committee member have agreed to nominate for a further term. So at the least we need two more committee members.

However, all positions will be declared vacant at the meeting and nominations for any of the following positions will be welcome.

- President
- Vice President
- Treasurer
- Secretary
- Committee Members.

# Cockpit Torque



**Hobart Model Aero Club Inc.**

**Annual General Meeting.**

**17th June, 2012.**

**Agenda.**

1. **Members Present.**
2. **Confirmation of Minutes 2010/2011 AGM.**
3. **President's Report**
4. **Treasurer's Report**
5. **Special Business.**

Changes to the Constitution.

**Item 13 of the constitution.**

" The public officer of the Association shall, at least twenty eight days before the date fixed for holding a general meeting of the Association, cause a notice of meeting to be inserted in the Association newsletter, specifying place, day and time for holding of the meeting, and the nature of the business to be transacted thereat, and forward a copy to each member."

**Be changed to read:**

"The public officer of the Association shall, at least 28 days before the date fixed for holding a general meeting of the Association, send a notice of meeting to all members specifying place, day and time for holding of the meeting, and the nature of the business that is to be transacted at the meeting."

Item 29 (3).

The annual subscription of a member is due and payable on or before the first day of the financial year of the association.

Be changed to read:

The annual subscription of a member is due and payable on or before the 1st July each year.

- **Election of Executive and Committee Members.**
- **Election/Confirmation of Auditor.**
- **Ratification of the 2012/2013 subscriptions.**

**Hobart Model Aero Club Inc.**

**General Meeting to be held on**

**17th June, 2012.**

**Agenda.**

1. **Members Present.**
2. **Confirmation of minutes of the 2011/2012 SGM.**
3. **General Business.**
4. **Events Calendar**
5. **Fly overs of the northern boundary.**
6. **Use of frequency board.**
7. **Instructors and Training**
8. **Safety**

( NOTE:- Please note that there is a black and white copy of this form for printing in part 2 of this edition )

## IMPORTANT MESSAGE FOR MODDELLERS

### North South Flightline

Due to the complaints from our Northern neighbour the committee is asking pilots to fly from the Southern end of the flightline.

We suggest that pilots enter the main strip via the cross strip entrance for LH circuits.

You will see that this entrance has been moved toward the windsock, the other entrance on the main strip is still available. This will move our flight paths South and this will help to eliminate the chance of over flying our Northern boundary.

# Member Profile

Phil Harrington

**Your first aircraft encounter - Full Size or Model - can you recall?**

I remember being terrified when my father took me to the pictures to see the Battle of Britain movie. I was probably 6 or 7 years old at the time. I also remember seeing a biplane (probably a Tiger Moth) land at the showgrounds in Launceston one year when I lived there – in the mid-1960s, we are talking about!

**How long have you been an aero modeller?**

I started out as a kid, probably around 6 or 7 years old, building both plastic (Airfix) models, as well as Guillow tissue covered, rubber band powered free flight models. I eventually graduated to a Tesla (?) control line Spitfire powered by a mighty Cox .049 engine. I loved the Black Widow .049s with the spring recoil start, as I didn't run to an electric starter back in those days..in fact, had they been invented yet? I liked the idea of the fuel tank being moulded with the engine – it was easy to transfer them from one model to the next. Not radio-controlled, of course – either free flight or control line.

**Your first model aircraft - details please**

I remember a Cessna Bird Dog Guillows model was one of the first, once I graduated beyond 'chuckie' gliders. Free flight, rubber band powered and much patched. I used to fly it in the 'horse paddock' over our back fence in Launceston, which is now the suburb of West Launceston. My first radio control model was much later – a 2m glider called a Windsong.

**Your first full time Employment**

I worked for some lawyers in Hobart (Clerk, Walker & Stops, they were called then, now just Clerk Walker) for 2 years – would have been 1980 and 1981, before I went to Uni in Canberra. I only returned to live in Tasmania again in 2004, after a period working in France.

**Your present Employment (or last if now retired)**

I work for Pitt & Sherry, a professional services firm mainly involved in engineering, but also building design, surveying, environmental and planning work. I'm an economist by training and I manage a team that does mainly policy and economic work for clients that are mostly out of the State – all over Australia. I also have an office in Canberra. So I travel a bit and don't get as much time for modelling as I'd like.

**Name three model categories in which you are currently interested**

Scale Warbirds for WW1 and WW2 are my favourites – especially the weird and wonderful inventions of the Germans in WW2, like the Horten Ho229, or the Blohm & Voss BV141 (asymmetrical).

I flew model glider competitions in the early- to mid-1980s, and also full-sized ones for a while, so I've always had a soft spot for gliders. Electric ones are much easier than the bungee/winch days! I have a Europa (4m wingspan) kit that I'll build, one day…

Third would have to be anything a bit unusual. Like Doug's old FlyCat that he crashed up and which is about to reappear….as a canard! What about a Junkers Ju 287 with swept forward wings? Huge scale Me163?

**Have you been involved in other Hobbies i.e. Boats, Trains etc.**

I used to run some model boats as a kid. A favourite was an old Aeroflyte swamp boat that run with an OS10 or 15. Used to run that at Cornelian Bay, but I can't tell you how many times I

(Have a look at one of Phil's models go to Field Torque in part 2 of this special edition of Torque Back)

"Now let's see you make a square loop!"

# Member Profile

Continued...

had to go swimming for it. I also built a couple of hydrofoils that ran on a marinised diesel (that I still have somewhere). I mostly remember it was just about impossible to start.

**Most admired person in model aviation**

I haven't had too many role models that I remember. I got into control line because my older brother was into it, but his main interest was trains…never could see the attraction myself. There was and still is a very active modelling community in Canberra, where I lived for nearly 20 years. I was a member of the Belconnen Model Aero Club for most of that time.

**Do you have confidence aero modelling will survive the ipod age?**

Sure…you can fly a helicopter using your iphone anyway! Mind you, I've had zero success in interesting my 14 year old son in picking up the sticks.

**Do you have a current project on the building board**

How high can you count? I tend to start one, get distracted doing repairs on another, then start another one, etc. Main projects on the go are an SE5a for 60FS; a Clipped Wing Piper Cub; the rebirth of the Fly Cat (that I think I'll call the 'Mad Cat'); plus I'm finally building a very old QB Cessna kit that I've been carrying around with me for 30 years. The ply will probably fall apart from old age. I mainly fly ARTFs for a simple lack of time in the modelling shed.

**Favourite full size aircraft**

FW190 (D series).

**Favourite model engine**

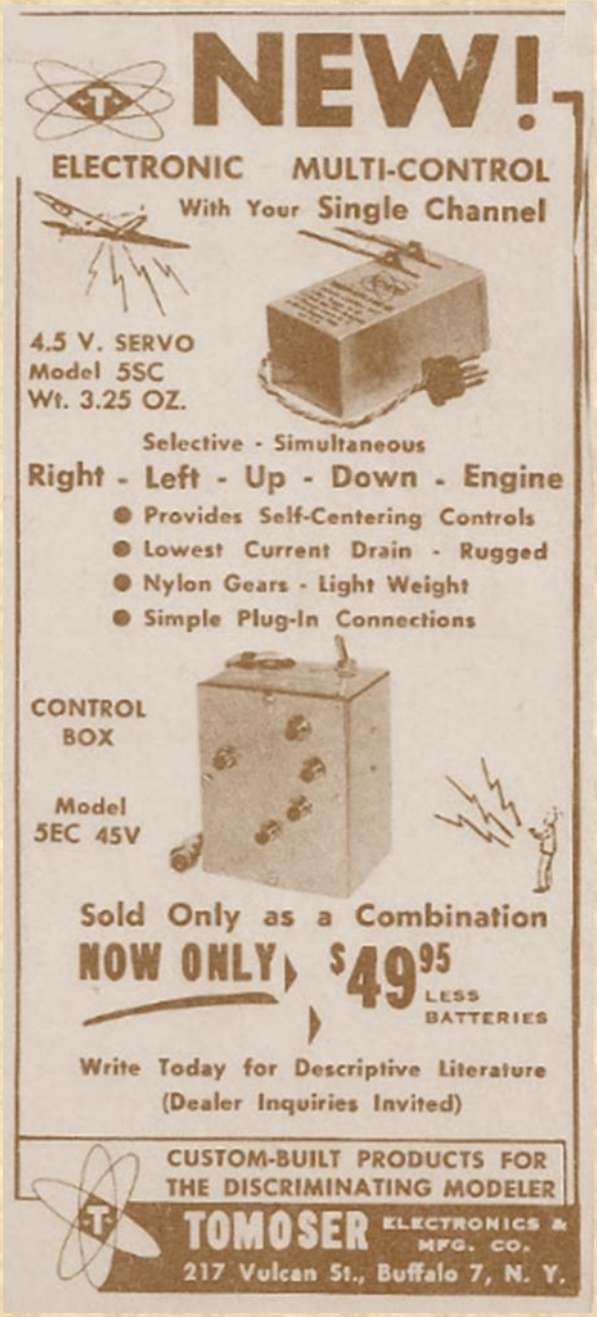
I have a 160 FS twin that I'm waiting to find a suitable model for. I also have a Cox .049 racing motor that will definitely bust our noise limits. Cover your ears if I ever fit that to something!

**Best memory of model building or flying**

I used to love slope soaring gliders on the hills around Canberra. Pity there doesn't seem to be any good sites around Hobart….

**Favourite place in Tasmania (other than Kelly Field).**

I grew up around Launceston and Scottsdale, fishing the Ringarooma River, the Cut, etc – that's probably it. In fact, any trout stream will do.



# Torque-a-tive

**Dear Editor,**

The calculations for determining which electric motor to use in a model in the last newsletter makes rather a feast of the issue and it can be simplified considerably using a more empirical approach.

First - experience has shown that any conventional model will require input power as follows.(note it is input power we are talking about and allows for reasonable running efficiency)

For adequate trainer type performance = 200W per Kg model weight

Everyday sports flying, simple aeros etc = 400W per Kg model weight

Serious performance 3D, verticasl climbs etc = 800W+ per Kg

Naturally these figures are guidlines and you can safely deviate or interpolate the figures to get into the ballpark. .

Now - W (watts) is a metric power value and is the product of Volts and Amps. You can get W via any combination of the two. To give an example 12V x 10A = 120W just as 24V x 5A also = 120W.

A practical example - A common battery is the 3S LiPo which has a loaded voltage of around 11V. If you have a model that weighs, say 1.5Kg, and you want a good general purpose performance, you will need about 250W to 300W. Using the 3S liPo you will have to draw about 27A

If you want to reduce the current draw then going to a 4S LiPo (14V) will for the same wattage, draw 21A

Don't forget you need a buffer above the projected load. By this I mean do not expect a 30A ESC to carry 30A continuously without protest. The general rule in industry is to limit loads to about 66% of an electric / electronic units design limit to ensure reliability which means using an ESC and motor in this illustration capable of handling around 40A.

Once you decide on the power required it is then necessary to decide how to obtain it ie on the battery size and the motor characteristics but this is a subject for another day

As far as power required is concerned that's about it. Mind you, you could look at what others are using for similar models and go from there or even read the recommendation on the box..

Nils

—x—

Dear Editor,

*Four crashes in four weeks due to radio failure; it happened to me, but might easily have been you!*

Very recently, I have had the distinctly unpleasant experience of losing radio contact with both my Wild Wing and Tomboy, and then watched helplessly as the models spiralled uncontrolled into the ground - both models, not just once but each on two separate occasions! Given that when these incidents occurred, the Wild Wing was travelling at significant speed relatively close to the ground, whilst the Tomboy was gliding slowly at considerable height, I was indeed fortunate that both models survived the multiple events with minimal damage. Four such similar incidents in the space of as many weeks was obviously a matter of real concern. The big question was why?

I have been using a Spektrum DX7 system now for about four years and, up until a month or so ago, I had not experienced a single incident indicative of radio system failure. During this period, whilst a significant proportion of my flying has involved models equipped with “full range” Spektrum receivers, I have also clocked up more than 100 uneventful flights with my Wild Wing that is fitted with a Spektrum AR 6100 park flyer receiver. It is perhaps significant however that, as is the case for my larger models, I always tend to fly the Wing in circuits relatively close to the ground and well out in front of me.

My Tomboy, like my Incubus, is equipped with a popular low cost non-Spektrum micro park-flyer receiver. Fitted with a single tiny aerial, it is widely understood that any such airborne RX system must inevitably suffer from reduced range as well as an increased vulnerability to spurious signal loss. The fact is however, that many such systems are currently being flown successfully at Kelly Field and, with neither of my two such models having previously displayed any apparent problems, I had perhaps developed a somewhat inflated degree of confidence as to the practical limitations of these little receivers.

The two incidents involving my Tomboy both occurred when the model was in front of me but, significantly, at considerable height. Given that I have always previously held my transmitter

## Torque-a-tive cont...

against my chest at about 45 degrees to the vertical, with the top section of the aerial inclined towards me at 45 degrees, I now realise that with the Tomboy flying so high I would, on both occasions, have been effectively pointing the active tip of the aerial directly at the model. Notwithstanding my limited understanding of radio propagation theory, it is now readily apparent that this resulted directly in the breakdown of the radio link and my consequent loss of control over the model.

In both cases the Tomboy instantly went into a spiral dive with full rudder and down elevator applied, and I now appreciate just how lucky I have previously been not to have lost control of the Incubus in the same way. There have been several occasions when that model too has appeared to have developed a mind of its own, and engaged in very unpleasant spiral flight characteristics; a flight pattern that I had previously attributed to tip stalling of its elliptical wings. I now suspect that these incidents were in fact far more likely to have also been caused by transient signal loss as this model flew perilously high and close to the same potentially dangerous overhead situation.

As previously mentioned, I have also experienced two similar incidents where I unexpectedly lost control of my Wild Wing. On the first such occasion I was attempting some mild aerobatics under the tutelage of Peter Ralph, when I appeared to lose control of the model and it spiralled into the ground sustaining minor damage. The radio functionality was checked immediately following the crash and appeared to be OK, so Peter and I put the incident down simply to pilot error. Significantly we did not however carry out a range check at that time! Subsequently, having identified the reason for my two Tomboy crashes, I jumped to what proved to be an erroneous conclusion that the Wild Wing had, most probably, suffered the same fate as the Tomboy and crashed because I had once again pointed the transmitter aerial directly at the model.

The model was repaired and a couple of weeks later I attempted to fly it again. Before doing so I carefully checked that all the controls were functioning normally but, significantly, once again I failed to carry out a range check! The result - after a perfect hand launch, the model climbed away under full power for about 50 metres before once again spiralling uncontrolled into the ground!

This time, a comprehensive check of my Spektrum transmitter and receiver involving the use of another Spektrum transmitter that was operating normally, allowed us to trace the fault to one half of the receiver's twin antenna wires having broken away at its soldered connection on the circuit board. It had apparently remained in position in the surrounding foam, making and breaking with impunity for goodness knows how long!

This modeller has most certainly learned a number of salutary lessons from his recent experiences and, as a consequence:

The tip of my transmitter aerial will in future remain firmly bent at right angles to the base section on the top of the transmitter and pointing vertically upwards when the transmitter itself is being held horizontally. As long as one continues to face directly towards the model, and you remember to tilt the transmitter progressively upwards as the model gains height, this arrangement should ensure that the aerial will never point directly at the model, and the model will remain at all times exposed to the optimum radio signal path.

Despite it being a real pain, this modeller will in future be doing a routine range check on each of his models, before every flying session and, even more importantly, after any repairs or sudden and unexpected returns to earth!

Happy landings,

Chris Rowe

## Torque-a-tive cont...

Dear Editor,

GUIDE TO AVOID OVERFLYING KELLY FIELD BOUNDARIES

MAAA rules state that our models when airborne shall not approach closer than 30 metres to our field boundaries. Unfortunately quite a few members have disregarded this rule many times in the past. From my observations, this has not been done deliberately, but has happened more due to a lack of attention to keeping the model in the required area, or lack of knowledge and flying skills to achieve the same objective.

The facts are that models have been seen, and have crashed, outside our boundaries, and have hit power lines. So there is no question that models are being flown in contravention of various MAAA and club rules.

The solution to the problem, is, that firstly the Committee have to make every one aware of the short term and long term ramifications of straying outside the designated flying area. I am informed that the Committee are working on various ways to solve this problem.

The second solution is that those, who wish to fly models, must only do so, if they have the skills and knowledge to do so competently, and must only fly models within their capabilities, so as to be able to abide by the relevant rules.

Pilots trained in the last few years to HMAC Bronze Wings standard have all been taught the techniques to avoid infringing, so any lapses on their part are probably due to inattention or lack of awareness.

As well as inattention or lack of awareness, there may be some pilots who are self taught, or learned in the dim dark ages, when as soon as one could sort of take off and land, were sent off on their own, to crash their way into the future. These people may not be aware of what is involved in safe flying by today`s standards. To put it bluntly, the days of wandering near and far, half under control, and then going an even a greater distance away, to make a long leisurely approach for a landing, from any direction are over.

To meet todays restrictions, pilots at Kelly Field must be able to fly accurate, relevant sized circuits continuously within our limited area, and be able to fly precise down wind, base and landing legs, for any wind direction.

It is imperative that landing approaches from the northern end should be kept within boundaries. This can be done easily by keeping the model close to the pilot and the runway, and then executing a procedure turn either left or right. This then enables a short base leg, maybe only 25 to 50 metres at the most from the edge of the runway. For safety reasons, to land east/west on the cross strip, the procedure turn can only be initiated towards the Richmond direction.

Precise throttle control is essential for above techniques. If you are Bronze Wings standard, this should be no problem.

The basics of the above procedures are well documented in the MAAA Trainee Pilots Handbook . Copies are readily available. Advice or tuition on the above procedures can be obtained from club Instructors.

The Committee have made it known that there may be an uncertain future for our long term use of Kelly Field if infringements continue. Therefore, as I see it, from now on, it is up to members to make the effort to obey the rules, and if they do not have the skills to do so, make the effort to get some tuition and guidance.

Peter Ralph (Chief Flying instructor)

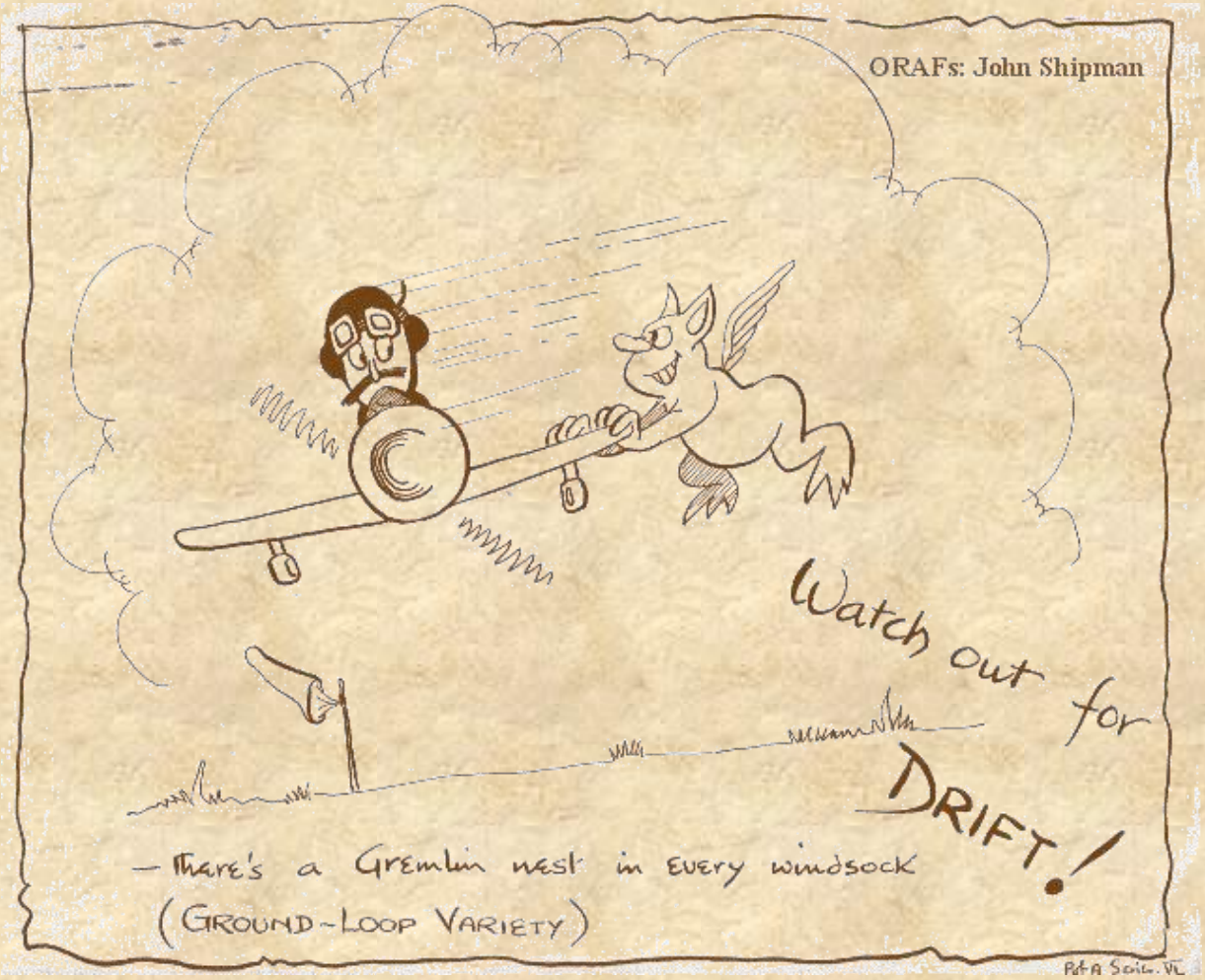
# Field Torque

A day on the line.

These photos were taken at Kelly Field on the day of the visit by the Launceston club members.

Apologies to the pilots of these models I was not given any information so please feel free to comment to editor in the next edition of Torque Back to clarify things  Ed.

# Funny Torque




Hint :- They were both lost in the tragic accident

# Bench Torque


From 'Aeromodeller, June 1948

Original heading photo Heading photograph shows Dennis Allen's Super Cyclone powered stunt model taking off at the recent Round Pond television show put on by members of the West Essex club.

Whilst the popularity of the control-line movement in America was initially built up on speed and sport flying, the past two years has seen a remarkable swing over to stunt and aerobatic flying. Now the emphasis is on the latter and models of this type have been developed to a high degree of perfection.

Jim Walker's "Fireball" - the model which really started the control-line movement - was actually the first model to fly inverted and loop, although this was essentially a "sport" design. Then followed numerous other designs and gradually the range of possible manoeuvres grew. Certain basic requirements soon became established - the need for a symmetrical aerofoil section for inverted flying, for example. Yet the famous "Fireball" still held the stage. Fitted with a special symmetrical section wing and lightened to a degree it was the first model to perform manoeuvres from inverted flight position and to demonstrate square loops.

The first stunt models were almost invariably large and fitted with the most powerful medium-speed motor available. Slagle's 1946 American Nationals winner, with its 415 square inches of wing area powered by the Super Cyclone 10 cc. motor is typical, 'But more recently smaller and lighter models have appeared with (American) Class B motors which perform equally well and have generally proved capable of taking hard knocks with less serious damage to the airframe.

Crashes with stunt models are still pretty frequent - even amongst the experts. Things happen quickly with the model flying at anything between 50 and 70 m.p.h. and it is all too easy to do the wrong thing at some crucial point in an advanced manoeuvre.

The basic requirement for success is, of course, a model capable of performing the necessary manoeuvres. There are no hard and fast rules as to the design layent for such a model, apart from one or two generalisations. By far the best method in designing a new model is to work on data relating to previously successful models.

In spite of the fact that there are a considerable number of highly successful stunt models in America these data are not always easy to find, especially by the average model builder with no American contacts. Table I has therefore been carefully prepared to meet this requirement and covers most of the well-known American - and a few British - designs which are fully aerobatic,

Of these models listed, "Hot Rock" - winner of the 1947 American Nationals Stunt Event - "Green Dragon", "Super Zilch" and "Fireball" (stunt version) have proved that they can do every manoeuvre possible with a control-line model. Probably a good many of the others could, as well, but data is lacking on this subject. Hence the figures in Table I should provide a very useful guide for new designs.

# Bench Torque *Cont...*

Ref. Fig. A.

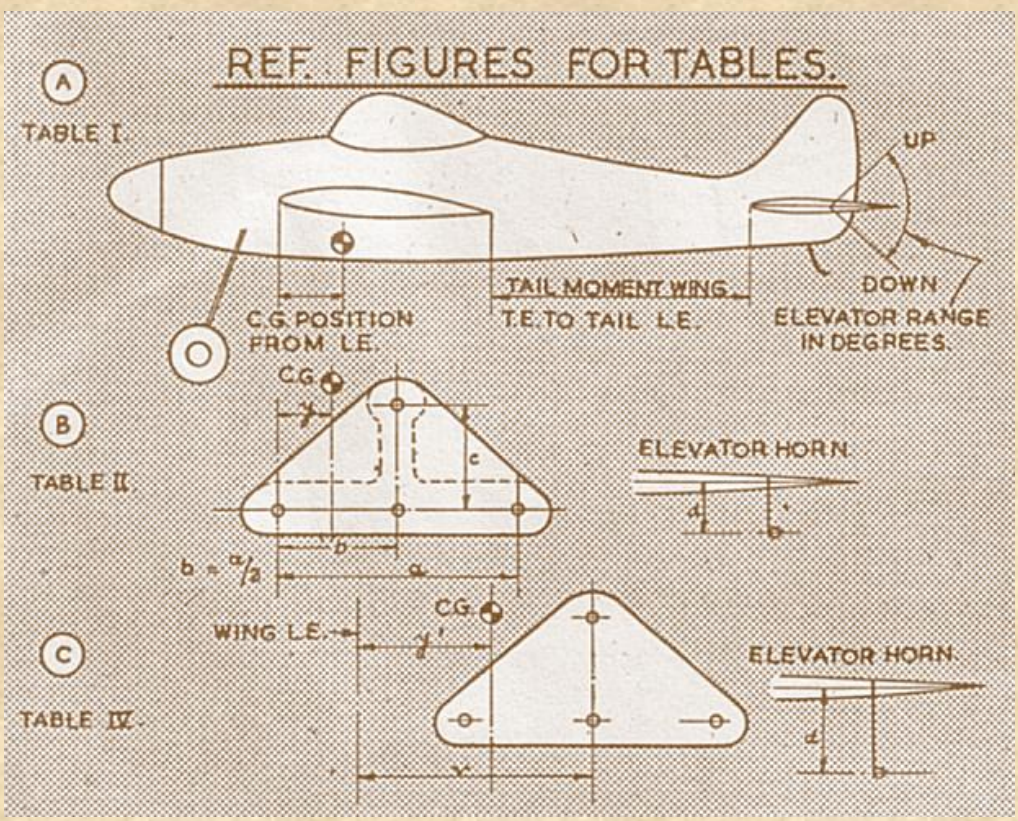
TABLE I. STUNT CONTROL LINE MODEL DESIGN DATA

| Model | Wing Area Sw | Span (in.) | Chord (in.) | C.G. Posn. (in.) | Wing Section | | Wing Position | Total Tail Area St | | Elevator Area | | Elevator Range | | Moment Arm L (in.) | Motor | Propeller | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Type | Thickness % Chord | | Sq. in. | %Sw | Sq. in. | %St | Up (deg.) | Down (deg.) | | | Dia. | Pitch |
| DRONETTE ... ... | 206 | 35½ | 6 | ¼ | Symmetrical | 9 | High-Mid | 60 | 29 | 24 | 40 | — | — | 12 | Drone | 10 | 12 |
| HOT ROCK ... ... | 261 | 38 | 7 | — | Symmetrical | 14 | Low-Mid | 65 | 25 | 36 | 55 | 45 | 45 | 10 | Drone | 11 | 10 |
| BARNSTORMER ... | 264 | 33½ | 8 | — | Symmetrical | — | High | 55 | 21 | 25 | 45 | 45 | 45 | 11¾ | Super Tigre | — | — |
| GREEN DRAGON ... | 470 | 50 | 9½ | 2⅓3 | NACA 99 | — | Low | 97·5 | 21 | 45 | 45 | 40 | 40 | 8 | Orwick "64" | 11½ | — |
| PLAYBOY ... ... | 410 | 50 | 8½ | 2½ | Symmetrical | 12½ | Mid | 88 | 21·5 | 40 | 45 | 40 | 45 | 10 | Ohlsson "60" | 12 | 6 |
| ROOKIE ... ... | 185 | 35½ | 5½ | 1½ | Thin Clark Y | 8 | Mid | 41 | 22 | 16 | 37½ | 25 | 15 | 11½ | Class B Motors | — | — |
| SCIENTIFIC CYCLONE | 220 | 36 | 6½ | 2 | Clark Y | 12½ | Low | 65 | 34 | 25 | 37½ | 35 | 15 | 11 | Ohlsson "60" | 12 | 8 |
| TEFFT'S TERROR ... | 310 | 40 | 8 | — | Symmetrical | 12½ | High-Mid | 72 | 23 | 32 | 45 | — | — | 16 | Class C Motors | — | — |
| SLAGLE "46" ... | 415 | 48 | 9 | 2 | Symmetrical | 14 | Mid | 96 | 23 | 45 | 47 | 40 | 30 | 8 | Super Cyclone | 12 | — |
| SIDEWINDER ... | 270 | 40 | 7 | 1 | Symmetrical | 15 | Mid | 70 | 26 | 40 | 57 | 45 | 45 | 10 | Ohlsson "60" | 12 | 6 |
| FIREBALL ... ... | 190 | 36 | elliptic | 1⅛/1¾ | Symmetrical | 12½ | Mid | 42 | 22·5 | 15 | 35 | 30 | 30 | 10 | Class B Motors | — | — |
| SKY BOX ... ... | 294/266 | 42 38 | 7 | — | Symmetrical | — | High | 74 | — | 30 | — | 45 | 45 | 12 | B C Motors | — | — |
| MADMAN ... ... | 450 | 54 | AV.8½ | 2½ | NACA 99 | — | Low | 100 | 22 | 45 | 45 | 40 | 40 | 9 | Orwick "64" | 12 | — |
| BOXCAR CHIEF ... | 384 | 48 | 8 | 2 | Symmetrical | | High | 96 | 25 | 48 | 50 | 45 | 45 | | Class C Motors | — | — |
| SUPER CINCH ... | 250 | 36 | 7 | 2 | Symmetrical | | High | 62·5 | 25 | 31·5 | 50 | 45 | 45 | 12 | Class B Motors | — | — |
| STUNT ACE ... | 205 | 36 | 6 | — | Symmetrical | 8 | Mid | 60 | 30 | 30 | 50 | — | — | 11 | Class B Motors | — | — |
| AKRO-BAT ... | 400 | 48 | 8½ | — | Symmetrical | 12½ | Mid | 120 | 30 | 60 | 50 | 40 | 40 | 10 | Class C Motors | — | — |
| SUPER ZILCH ... | 500 | 54 | 10 | — | Symmetrical | 14 | Mid | 75 | 15 | 30 | 40 | — | — | 9 | Super Cyclone | — | — |
| LIL' ZILCH ... ... | 250 | 52 | 7 | — | Symmetrical | 14 | Mid | 37·5 | 15 | 15 | 40 | — | — | 6 | ·19–·36 Motors | — | — |

Table 1

For stunt work, of course, a powerful and reliable motor is absolutely essential. The motor must run smoothly throughout the flight in whatever attitude the model assumes. This necessitates a stunt tank as a standard fitment, these tanks being specially designed to combat both centrifugal force (tending to pile the fuel against one side of the tank) and provide constant fuel flow in different flight attitudes.

Given the model, and the right motor and tank combination, the remainder is up to the flier. The only golden rule to success is practice - and the more practice an individual gets in, the better flier be will become. Dave Slagle - a consistent winner, although only in mid-teen age - practised for several months, flying for an hour or more every day to perfect his stunt routine for the 1947 Nationals. On the other hand, given the right model success may come more quickly. Paul Bender won the Columbus Ohio stunt event with a "Super Zilch" (built from a kit) on the model's tenth flight-and the Ohio State Championship on its seventeenth flight.



# Bench Torque *Cont...*

Certain leading data is omitted from Table I and covered in later tables. This is because many of the American designs listed are kit jobs and to avoid infringement of the Jim Walker patents on control-line, details of control assembly, control plate layout, etc., are omitted from the plan.

Table II attempts to remedy this omission by listing "standard" control plate sizes.

| Type | a in. | c in. | d in. | y in. | Application | Examples |
|---|---|---|---|---|---|---|
| BAT | 2 | 1/4 - 7/16 | 1/4 - 3/8 | 0 - 1/4 | Most small control-line models 16-24 in. span. | Phantom, Wizard, Goblin, Stunter, Phantom Mite. |
| MERCURY | 2 | 11/32 - 17/32 | 1/4 - 3/8 | 0 - 1/4 | Most small controI-Iine models 16-24 in. span. | Phantom, Wizard, Goblin, Stunter, Phantom Mite. |
| MERCURY | 2-3/4 | 5/8 - 15/16 | 5/16 - 1/2 | 0 - 1/2 | Medium size models up to 6 - 7 in. chord. | |
| AMERICAN JUNIOR | 3-7/8 | 5/8 - 7/8 | 1/2 - 3/4 | 0 - 1-1/4 | Fireball Kit | |
| STANDARD AMERICAN LARGE TYPE | 3 | 5/8 - 7/8 | 3/8 - 5/8 | 0 - 1 | Most American stunt models | Dronette, Hot Rock, Slagle, Green Dragon. etc., etc. |

Where two figures are given for dimension, 'c' the larger is for stunt work.
Table III gives loading data, which is very useful as a general guide in preliminary layout of a new design.

TABLE III. LOADING DATA

| | | | Wing Loading | | |
|---|---|---|---|---|---|
| Model | Wing Area, sq. in. | Weight, ozs. | ozs per sq. ft. | ozs per 100 sq. in. | Power Loading, ozs per c.c. |
| DRONETTE | 206 | 25 | 17.0 | I2.1 | 5 |
| HOT ROCK | 261 | 26 | 14.4 | 10.0 | 5 |
| PLAYBOY | 410 | 50 | I7.5 | 12.2 | 5 |
| ROOKIE | 185 | 27 | 2I.0 | 14.6 | 7 |
| SCIENTIFIC CYCLONE | 220 | 31 | 20.75 | 14.0 | 3 |
| FIREBALL | 190 | 20 | 15.2 | 10.5 | 5 |
| SIDEWINDER | 270 | 30 | 16.0 | 11.1 | 3 |

Table IV gives rigging data on nine designs which can be linked up with similar models in Table I.

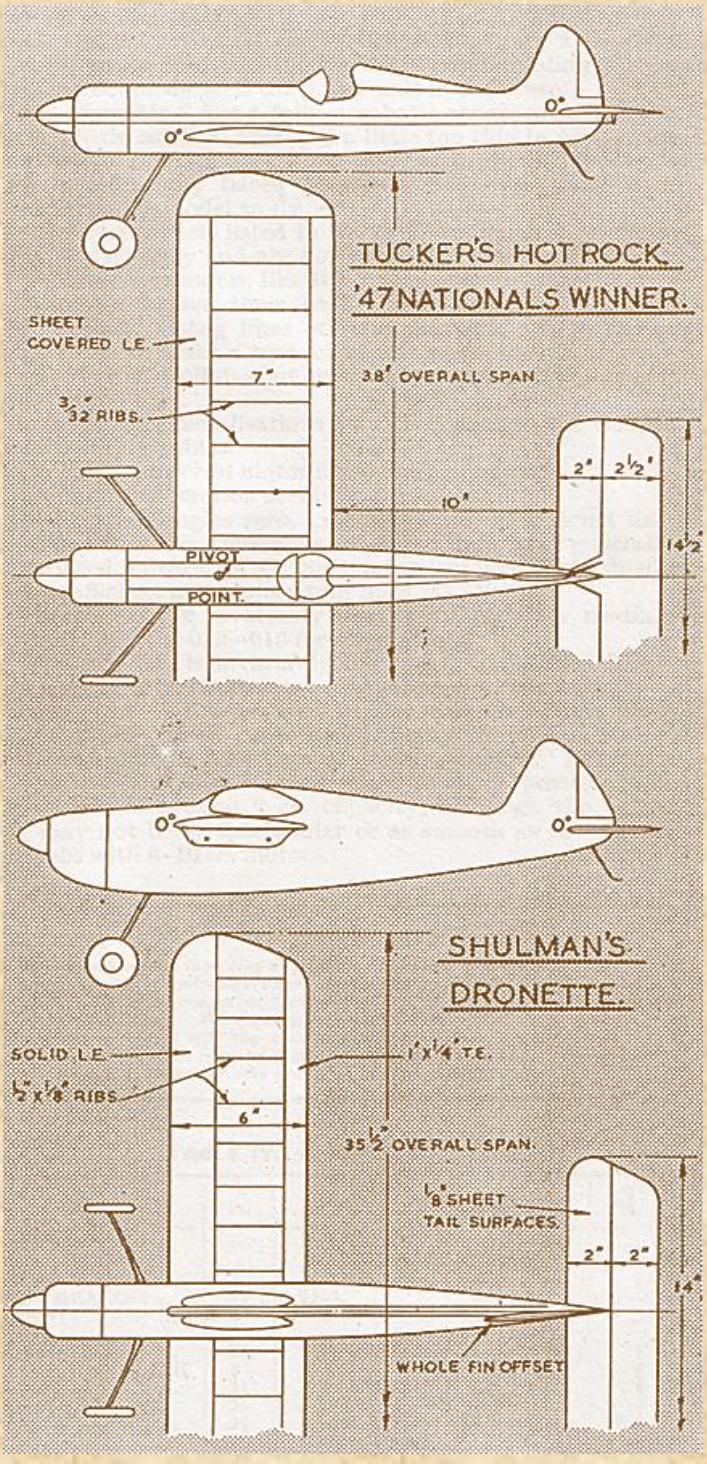
TABLE IV. RIGGING DATA

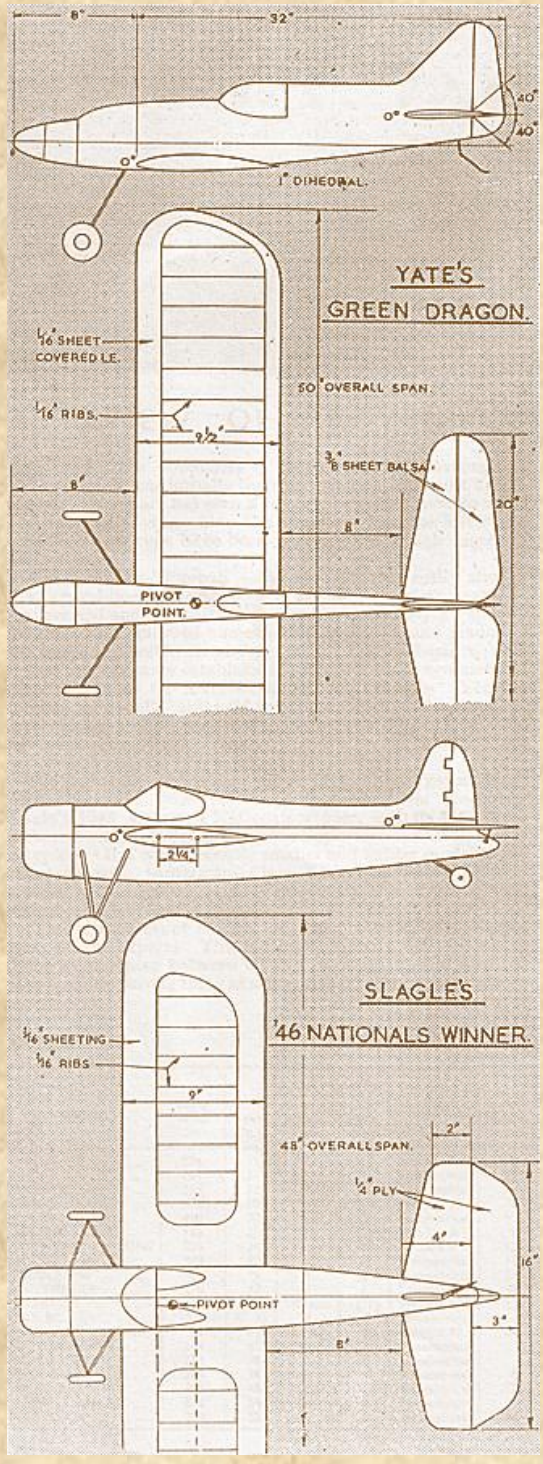
| Model | n in. | y' in. | Remarks | d in. |
|---|---|---|---|---|
| DRONETTE | - | 1/2 | "n" dimension not specifled on plan | - |
| HOT ROCK | 2 | 1/2 - 1 | - | 1/2 |
| GREEN DRAGON | 3-1/2 | 2-1/2 - 3 | - | - |
| PLAYBOY | 4 | 2 | C.G. in front of front line. | 3/4 |
| ROOKIE | 2-1/2 | 1-1/2 | - | 1/4 |
| SCIENTIFIC CYCLONE | 3 | 2 | - | 1/4 |
| SLAGLE "46" | 3-1/2 | 2 | - | 3/4 |
| SIDEWINDER | 2-1/8 | 3/4 | - | 1/2 |
| FIREBALL | 3-3/4 | 1-1/8 - 1-3/4 | Pivot point located well aft. C.G. in front of front line. | 1/2 - 3/4 |

There remains but the picture, the actual outline shape of these various models. Almost invariably the wings are parallel chord with rounded tips. Fuselages are short and mainly based on crutch construction with sheet balsa sides, top and bottom. Tail surfaces are almost invariably cut from sheet balsa, linen tape hinges being common, although metal hinges are now coming into wider use. Linen or tape hinges tend to fray and tear under continual vibration

The four general arrangement drawings chosen are those of outstanding models with many contest places to their credit. Leading dimensions are given and the outlines are accurate enough to be scaled, if required.

# Bench Torque *Cont...*




Hot Rock and Dronette  Green Dragon and Slagle '46'

The Green Dragon has an outstanding reputation for manoeuvres from the inverted flight position and is typical of the larger type of model preferred by West Coast fliers.Slagle's 1946 Nationals winner is typical of the large general-purpose stunt modej, alt-hough the modern trend is towards a
cleaner design:

Both the "Dronette" and "Hot Rock" are typical of Eastern practice, and both models have an outstanding contest record. A Drone diesel is the power unit in each case.

# Bench Torque *Cont...*

The "Dronette" has a fully aerobatic range, although the wing is a little small in area and a little too thin in section for best possible performance from the Drone diesel. Tucker's model is essentially based on the "Dronette" and is a particularly nice model to fly.

Most of the models listed in Table I are bigger than those used in this country and are flown on 70 ft. lines as standard. The medium size models, like the "Dronette", "Hot Rock" and "Rookie" give their best all-round performance on 55-60 ft. lines. Long lines on a model with a high power loading tends to make a true wing-over a breath-taking job - particularly to the pilot - but are an advantage for looping and similar manoeuvres.

The following generalisations may he applied to the various data given in the tables.

(i) Reliable, powerful motor fitted with stunt tank.

(ii) Symmetrical section aerofoil.

(iii) All rigging angles zero, i.e., wings, tail and thrust line. Offset thrust is sometimes employed, but is not generally advised. Correct C.G. position and rudder offset should be sufficient to maintain taut lines.

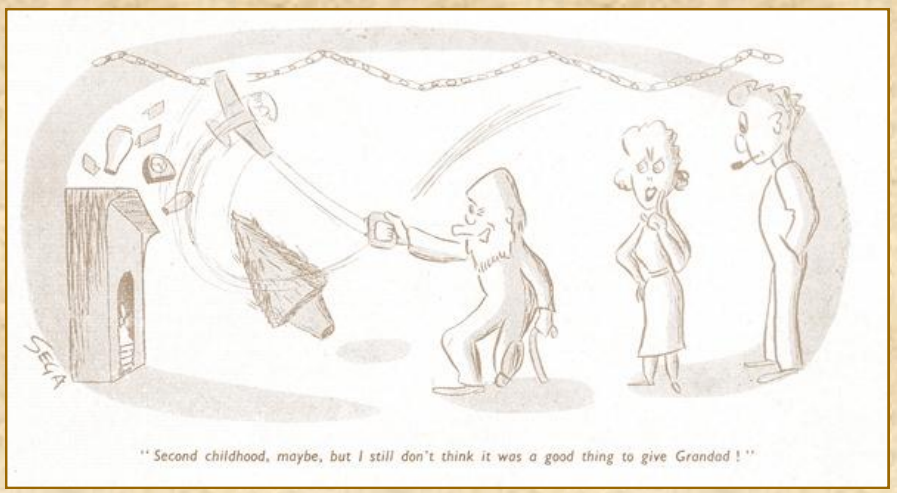


(iv) Steel lines are invariably used - .010 - .012 for medium size models; .012 - .015 for larger jobs.

(v) The rear line is invariably the "up" or "climb" line - i.e., the control horn is mounted below the elevators.

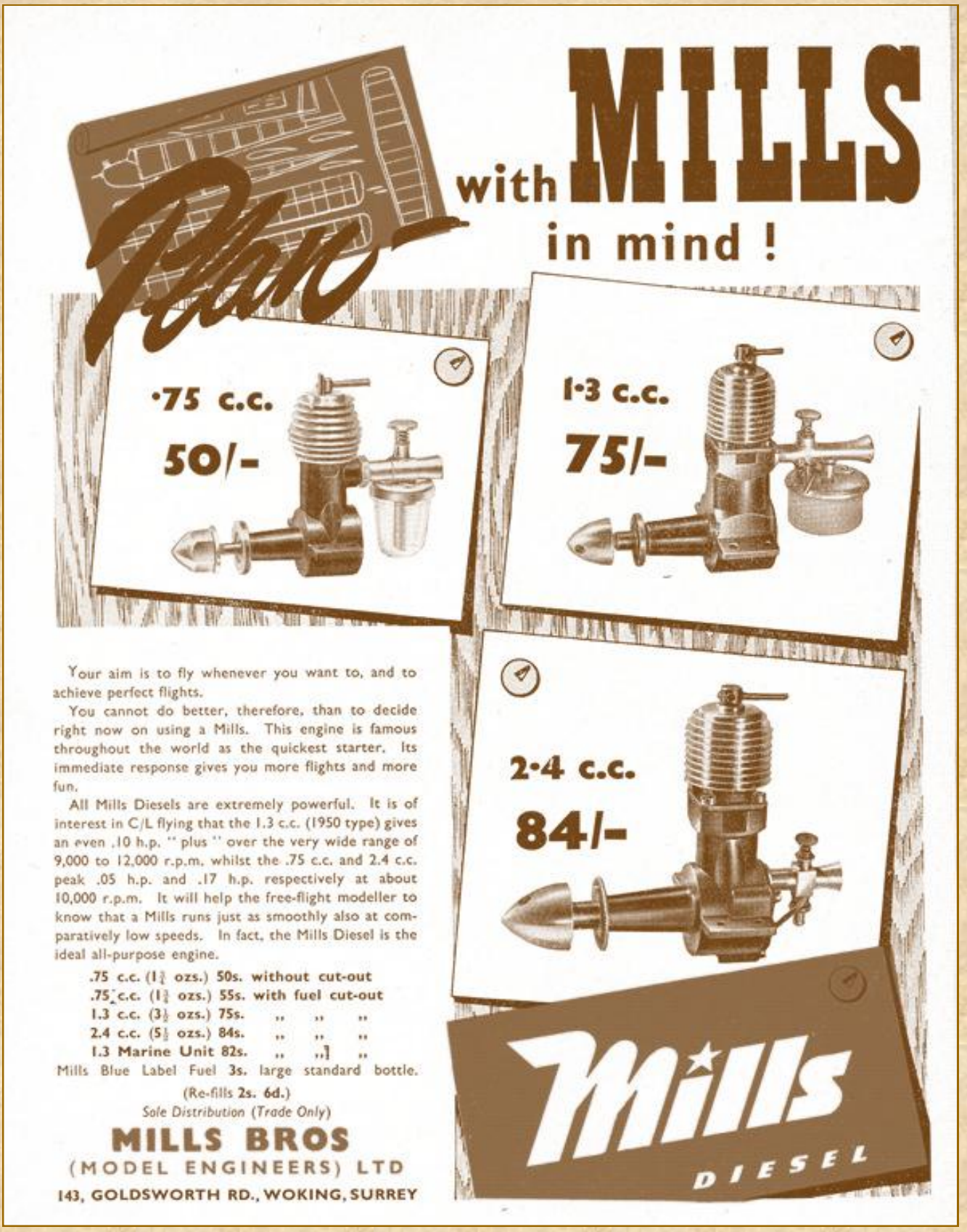
Whilst most of the designs detailed call for motors more powerful than those generally available in this country, scaled-down designs have proved quite successful. In fact, it has been recently proved that stunt flying is possible with small diesels of around 2 cc. capacity, although the actual flying may not be as spectacular or as smooth as that of the larger jobs with 6-10 cc. motors.

http://www.iroquois.free-online.co.uk/clc.htm Accessed 13/4/2012



"Second childhood, maybe, but I still don't think it was a good thing to give Grandad!"

# Torque Back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