

## WATTS-AROUND ?

### A 'Triple-Maiden' Electric Control-Line flight

On Thursday 5th April, I joined former schoolday chums and members of the Abingdon MFC, John Mellor and David Lovegrove at a (for now) secret site near Wallingford. The aim was to get some much-needed C/L practice in before the WMAC meeting at Cashmoor on the 15th. Additionally, this would be a major milestone in our combined exploration of Electric-powered C/L (ECL) with the maiden flight of John's recently-completed Midget Mustang.

After confirming that this site was entirely suitable for both IC and Electric flight, we set out the gear and unreeled my set of lines and handle. We all had a go with my VECO .19 Glow-powered Junior Flite Steak (mini-Peacemaker clone) as I had completed and flown it a few times in 2011. Although somewhat lively, this was a reasonably well-known quantity for me to tutor my colleagues who had not stepped into a C/L circle for some 40+ years !!

After establishing that datum, we then hooked up one of David's models (ED Racer-powered FIREBIRD ) for him to get back into prop-flicking practice and to inhale a few Ether fumes (heavy nostalgia). We then continued with another slightly less sprightly couple of tankfuls. The photos look tame enough but I resisted the urge to take a snap when John actually fell over from dizziness after just making it through his first full tank to a landing. I have to admit that I am in need of much more practice myself before I consider my own balance organs to be sufficiently desensitised. [Big 'thinks' bubble here:- I wonder if I can get the Institute of Aviation Medicine interested in C/L as part of the aircrew airsickness-desensitisation programme ?]. After this brief refresher, we felt that the time had come to make our first electric C/L experience and so, John's M/Mustang was transferred to the waiting lines.

For those who are not familiar with ECL, there are several ways of achieving the desired motor control for both power and flight time. A summary of those various techniques may form part of a later article when I review the completed C/L version of Alan Bond's timer. Rather than the complication of any 'down-the-lines' signal or an RC Tx in the handle, the method we have adopted stays closest to the original experience by using an onboard signal generator/timer. The model is a converted IC design using a Brushless outrunner, driven by a standard Electronic Speed Controller (ESC) and LiPo battery. Instead of an RC receiver to supply the Throttle signal to the ESC, a tiny electronic timer is connected to that signal input. This device produces an appropriate servo signal for a preset time (30 seconds to 15 minutes) and the maximum power level can also be preset. Although settings are available to introduce start-up delays, we had considered that there would usually be a helper to restrain the model and to press the "START" button whenever the man on the handle was ready. From previous experience, our first time periods were set at no more than a couple of minutes. That was "Plan A".

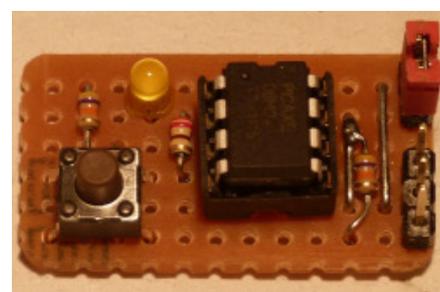
### "Tune for maximum smoke"

All Vintage (Valve) RF Engineers will recognise that test bench maxim.

Earlier that day, I had joined them at David's nearby home as they were interfacing and setting up a KR timer with the ESC on John's Midget Mustang. We had some problems interpreting the setup directions for that device and there also seemed to be a fault\*. I substituted my own KR timer but at some stage, the +ve battery lead came into contact with an exposed pin on the back of the timer which emitted a most impressive plume of smoke. Thus ended "Plan A".

### Plan B

Fortunately, I was able to produce my own outrunner testbed complete with a prototype Alan Bond timer that I had brought along to demonstrate progress with that development project. Alan may be known to some in the Southampton area for his electronic devices primarily for RC model boats. He is also to be seen flying "Mr. Floppy", a freeflight electric Indoor model with an earlier, smaller version of his timer weighing less than 3 Grams. I have been working with Alan over the last couple of months to develop this device to a form better suited to ECL. A further advantage of 'normal' C/L models is that the former miniaturisation of the timer is not so important, resulting in a design that may be available as a pre-programmed PIC chip plus a small number of other simple components for DIY assembly at low cost (*see picture*). What we had was a first prototype with software features arrived at from much discussion but no actual flying experience. This timer was quickly transferred onto the battery strap of John's model and temporarily fixed in place with a Velcro pad. A few quick button presses had the initial power and time settings and we quickly went with that to the field before we could destroy any more circuits. (There was no "Plan C")



Alan Bond Mk1 C/L timer

[\* After an exchange of emails, the KR 'fault' later turned out to be a missing instruction in the 'manual'. ]

Not only was this the maiden flight of the Midget Mustang but also our first joint attempt at ECL and also the first use of this timer for anything other than on a test rig. It rather offended one of the first rules of Test Flying "change only one

thing at a time”. With such a ‘Triple-Maiden’, we were moving into unknown territory. As I had a full year of recent C/L practice behind me (all of three tankfulls and the ability to fly continuous Horizontal Eights if I became dizzy !), I was voted into the centre spot. I took up the handle and when I gave him the nod, John simply pressed the “START” button and we were immediately airborne from a hand-launch with no fuss at all.

Two minutes later, the timer ended the run and a smooth landing ensued. A quick change of pilot and further simple presses of the “START” button enabled all of us to have more flights without any drama or needing to recharge the onboard LiPo battery.

The chosen power train was a little marginal but it produced adequate line tension and flew in a manner quite suitable for a basic trainer. I’m not sure that we had as much power as we really needed but that was a motor/prop/battery consideration and a rather windy day, not the timer’s fault. It is also possible that I hadn’t actually selected 100% power when initiating the timer for its unexpected first live flight. *(the setup instructions were 100 miles away at the time)*

While I am a confirmed member of the “Oily-hand brigade” and revel in operating all types of IC engines, I am struck by the (potential) simplicity of ECL and the scope for cheap indoor activities as well. As our experience of ECL is still in its infancy, I will not say any more for now until we have learned more. The CL version of the Alan Bond timer remains under development and a Mk2 with even simpler setup procedures will soon be airborne. Once we have gained that experience, I will write again to S&T with our findings and any tips will be passed on.

### **Midget Mustang Model Details:**

Peter Miller free plan: RCM&E May 2009  
Span: 42”  
Weight: 21b 3oz  
Motor: Brushless outrunner XYH35-36 1300kv 25A (from Giant Cod)  
ESC TORNADO XQ40A  
LiPo: Overlander 2200/3S  
Prop: 9” x 4.5” *(Not yet optimised for model/powertrain combination)*  
Lines: 42ft

‘Spike’ Spencer (April 2012)



**David Lovegrove starting the ED RACER in his FIREBIRD**



**Maiden flight of electric Midget Mustang**



**Oh yes ! It all comes flooding back**



**Maiden flight completed - Proud builder (John Mellor)**