

Air Racing

with Stephen Green

This will be my last racing column, as from the next issue, Byron Simpson from NSW is taking over the keyboard. I've only known Byron a couple of years but who better than a self confessed petrol head to cover the racing scene. Not only is he a good operator, he is very handy on the sticks too!

Byron put together this cute 39% Cassutt racer to test at Bendigo but the meeting was cancelled due to high wind and rain forecast. At sixty six inch wingspan, it doesn't fit the current rule. It was also raced after 1977. Having seen the prototype at Model Engines back in May it has considerably greater frontal area than the Nemesis or Sundowner. Which would make it less competitive. My gut feeling is that an extra half horsepower from a 60cc mill would even things up. So, here is another ARF available to race. Should it be allowed? My answer is yes. Over to you Byron.

SEAGULL CASSUTT 111 BY BYRON SIMPSON

Over the past few years Seagull has really come to the party in relation to large scale racing aircraft, whether it's golden era like the Sparrow Hawk or more recent style aircraft like the Nemesis Formula 1 aircraft. The benefits so far have been they have been eligible to race in the Large Scale Racing categories with bigger engines fitted or great sport flyers with the recommended engines. Well, now we have the next cab off the rank so to speak, the Cassutt 3M is modelled from a Formula 1 aircraft that has really stood the test of time. Developed by Tom Cassutt back in 1951 the Cassutt Racer first saw competition in 1954 at Dansville, New York and has been a regular household name in the Formula 1 racing scene ever since and continues to be raced today, and to the great delights of myself and other fellow large scale racers

There are a few hurdles to overcome if you plan on racing one of these at a Large Scale Racing event like the fact it is only a 65" wingspan, hopefully this rule will be altered before too long as the airframe is around 37% scale of the full size which means it is a bit larger than half the planes that raced at Adelaide (and a lot more scale over the 3 axis than some also). Keep in mind though that some of the comps on the racing calendar are happy to have it race. Since I had the plane sent up to me via a good mate who was returning my P40 from



One very happy post test flight pilot

the Adelaide Air Races at the same time, the only way he could fit the two aircraft and my associated Conglomeration of Racing Aircraft Pieces (C.R.A.P) in his vehicle was to remove it from the box. Safe to say though I imagine it was the usual enigma of parts that once out of the box were never going to fit back in, all the parts however, were still in their respective protective bags. I unloaded everything onto my super clean bench top (see photos) then began to inspect everything for quality and fit, and was pleased to see that Seagull have incorporated the fibreglass horns and recessed pin hinge systems that you would expect to see on the high end large aerobatic aircraft.

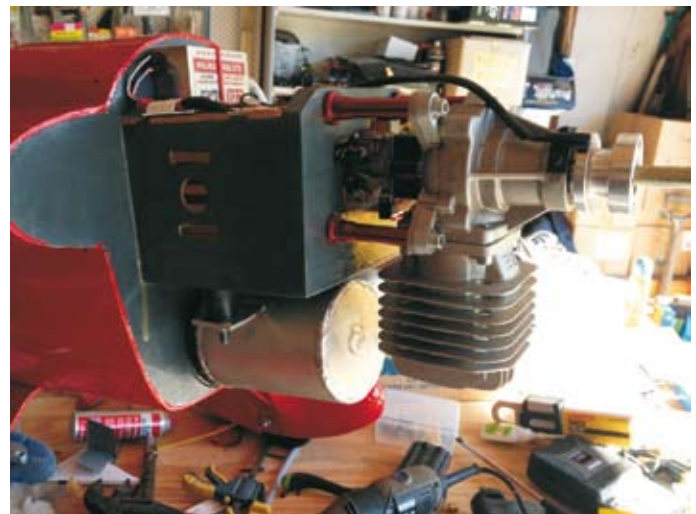
A quick dry fit of the tail, wings, canopy, and cowl gave the first impression of the relative size of the Cassutt and impressed I was since my biggest concern was how much of the 55cc engine was going to "hang" out of the cowl as it is recommended for 20-26cc power. That's right, engine wise the "there's no substitute for cubic inches" approach was taken". A small issue noted during the dry fit however was that the wings were not quite properly aligned to the fuselage. Which was a bit disappointing but not too bad.

The next step of course was to read the instructions to see what kind of any surprises I may encounter during the assembly process. The instructions are written well and offer plenty of info for those who are capable of flying something like the Cassutt. For those of you that are thinking "what's that supposed to mean?" It means this is an aircraft that would not suit someone as a first large scale flyer unless they are a pretty competent pilot. Having gone over the instructions again they were then set to the side of the bench and assembly began.

Seeing as I intended on putting a well over-sized engine in the airframe it is worth noting that had the recommended engine been installed the quality of everything supplied by Seagull was very good and definitely up to the task, and the assembly would have been a bit faster also since custom parts would have not been required. 26cc+26cc+another3cc=55cc

I skipped more than a few steps of the assembly process so as to see what other mods would have to be made for the change of engine. Wheels on to get the model off the bench a little and up to perfect work height, then mark the firewall for the possible engine configurations. Since the firewall isn't tall enough to mount the engine on its side, it was marked and drilled to mount the 55 inverted. This was not an issue as it fitted into the cowl both on its side and inverted pretty well. Time for some mods, the top plate of the engine box was right in the wrong spot so far as the top bolts of the engine stand offs were concerned. This meant gently prying the old top plate off and making a new one that would still offer the strength required, as well as good access to both the engine box and standoff bolts. Next was to mark the firewall to allow the carby to push back far enough to get the cowl back to its mounting points. With all that said and done the engine was mounted for the first of five times before it was mounted for the final time.

The best part about a build/assembly like this is there is always time to do something else while you're waiting either for glue to dry or bits to arrive, hence while shorter stand offs were coming over from WA, I got stuck into gluing the control horns into their respective slots.



A tip worth noting here is the fibreglass horns should be held in using an epoxy resin as the instructions suggest, though the base of the horn that will be put into the control surface should have the shine rubbed off it using sand paper, this will allow the glue to get a good hold on the horn. Also for ease of application I use hysol with a self mixing tip that I can inject the glue directly into the slot, remember you don't have to fill the slot with glue as there is still a horn to go in there.

I also picked up a packet of cheap paint and silastic edgers which is 4 squares of a semi soft rubber with each corner having a different size and shape, these work great for cleaning the glue joint and just wipe them down with isopropyl alcohol to clean them before the epoxy cures. Then fitted servos into the tail for the elevators with the leads run up to the front and the empennage was

Above left, new engine box top plate mounted

Above right; the bigger DLE55 doesn't look at all out of place

Seeing that the elevator servos are recessed into the fuse it was easy to hide them with scrap covering I had laying around



glued on. Due to the alterations to the front of the airframe and the expected tail weight required I moved the fuel tank from behind the firewall to under the wing tube on the CoG, I also used a dubro tank due to it

having a flat bottom. The next hassle was the throttle servo was meant to be mounted where they fuel tank now is, to get over this hurdle I simply cut a new slot for it in the side of the internal box section of the

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fuselage with the base of the servo hiding inside one of the cheeks that extend down the sides of the fuselage.

SO WHAT NEXT?

With the new stand offs fitted the firewall needed to be trimmed some more to let the carby a bit further back still. And once I was happy with the way everything fitted the engine was removed for the final time while the engine box was covered with a thin coat of epoxy resin to seal everything up. Once all that was cured and everything put back on it was time to start on the noise killer, off to a mates place and the muffler was made. It ended up being a piece of aluminium tube that he uses to make coldy holders for boats, and old aluminum spinner I had laying around, and finally the intake half an RC monster truck muffler cut off for the tip. The header pipe was made using DA header parts and silver soldered together in the right configuration.

With all the major mods now completed it was time to finish off the last bits like servos in the wings and glue the pilot and canopy onto the hatch, all the servos I fitted to the plane fitted perfectly into their respective holes. The instructions recommended throws were used and they are pretty good, no lead was added for CoG though the receiver battery is mounted on the floor behind the hatch and the ignition pack is mounted right down in the tail. There are nice little cut outs on either side of the fuselage below the wing mounts, one to suit a standard size switch and one to suit a larger style switch like the type with a charge plug moulded into it. I made use of both holes, one for the receiver and one for the ignition.

With all the linkages hooked on and the radio set up the way I like it and control throws set up as per the recommended deflections I did a CoG which is what decided exactly how far back the batteries went,

Cowl cut-outs and the header goes on after cowl is fitted



Fast and low! Other way Byron. (In NSW, their race horse turn the wrong way too! Ed)

wherever possible I will move useable weight to get a correct CoG to avoid using dead weight like lead.

Being a sucker for not wanting to wait any longer I put some fuel in it and fired it up to see how my home made muffler would sound, I'm pleased to say the muffler worked well and it rated 98db on the noise meter when averaged off all 4 sides.

The canopy did not do so well, it blew off during the second run up and closer inspection showed the lugs that hold it on don't protrude far enough to keep the canopy latched down sufficiently, for the test flight I simply added tape around the hatch to help hold it down then made new latches later through the week. Once finished I thought it best to weigh the aircraft and see where it came in at, unfortunately it



The final cut out in the firewall to allow the carby to sit back further. (Some Heavy Model Inspectors are uncomfortable with this due the to possibility of an engine backfire and fumes inside the fuselage. Ed)



Right over the centre line

bounced just over 7kg so I sucked every bit of fuel out of the aircraft including running the engine dry to get it down to a final dry weight of 6.967kg. This is somewhat above the claimed flying weight on the instructions, but it also has a great lump of engine sitting in the nose so I am happy with the weight it came in at.

GENTLEMEN START YOUR ENGINES?

With the Bendigo event looming (at least it was at the time) it was important it had some test flights in before heading south to race, the weather on the day was close to perfect, myself on the other hand was doing pretty average due to the dreaded man-flu. Not to be deterred I packed the van and headed for the strip, by lunchtime I was feeling good enough to have a go and the plane got some quality beauty shots in while I prepped my head for the possible things that could be about to happen when one overpowers an airframe beyond the recommended specs, then puts a high pitch prop on the front.

The usual expectations is for the plane to try and steer to the left and roll the same way when it gets off the ground, thanks to the increased torque effect, especially with such a stumpy wing.

Taxi tests went well and the take of run was perfect at half throttle, the plane did require a bit of aileron trim which is most likely due to the torque of the engine with a large pitch prop mounted to it. Feeling quite comfy with the Cassutt I opened the throttle and got stuck into some high speed tests, dives were good from height with no bad tendencies as well as high G turns (I did upgrade the standard alloy wing tube to a PBG 25mm carbon tube which was a perfect fit to replace the original,

the original may have held up OK but it's something I wasn't willing to risk finding out if I was wrong), straight line speed was still down a little bit but further test flights helped that issue with engine tuning and prop testing, rolls at low rate are about 1 roll every 2 seconds and loops are large. Gain a little height and slow it down, stalls are good and not violent and even with a smaller wingspan it still has a good glide for a larger plane. Line it up and head in on finals and with no surprises it lands with no problems aside from the engine stopping at the end of the roll out.

LINING UP FOR THE FINAL LAP

As a sport plane this is a fantastic flyer, I can easily fly it around on 1/3rd throttle so even with the recommended set up I think this would be a superb aircraft. Short of the canopy latches requiring replacement to something more sufficient, the quality of the kit is very good as is the hardware supplied. The Cassutt 3M would look great at any scale fly in and you don't need to know how to do 3D to make this machine fly to its full potential, while at the same time it holds a presence in the air that will get heads turning the way most civilian aircraft won't.

As a Large Scale Air Racer it needs a few mods, as listed in the review, and though I think it will be some time before an ARF can outperform some of the scratch built F1 models, the Cassutt 3M is a fantastic entry into the F1 category. I think it won't be too long before there are more of them racing around the poles." Thanks Byron.

THE FUTURE

When this column started there was one race meeting, every second year. Continued growth of Air Racing is dependent on attracting new people. Once they have experienced the thrill, some will go on to build a specialist model and most will choose to punt their ARF around. Racing a mass produced model against a specialist racing machine will ultimately prove uncompetitive, but there are enough classes to satisfy both. Red Bull is ARF only. One can still build a Texan but it's predominately an ARF category and there is still plenty of support for AT6 in Victoria. With a few ARFs available for Reno, F1 and Golden Era, these categories cater for both though the latter really is a builders class. An ARF may not always get you to the pointy end

Charlie and George



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but provided race times are matched, there is a hell of a lot of fun to be had racing one. Part of my vocation is flying models and in context of reviewing, and increasing the horsepower over the airframe manufacturers suggested engine capacity, I've probably had more experience than most. I usually get to see new offerings before most people too! My Seagull Nemesis has 55cc instead of the 20cc stated on the box. Around about a hundred flights and after sorting out a few bugs caused by vibration, the model has not broken up, nor has it fallen apart. Likewise my Hangar 9 Sundowner with a DA 50. My Seagull Decathlon is way overpowered with an OS 160 FX and

with 26cc it does not qualify for Red Bull. But it was raced in the first Red Bull 62cc trial class at Cobram 2011. My Seagull Texan raced in Adelaide in 2009. Like my Nemesis and Texan, the Bellanca has also been hammered from pillar to post. All three models are still in serviceable condition. Situational awareness, reliability of setup and flying skill are the key factors in successfully racing any aircraft.

Small meetings operating one set of lights have their place and help attract local new entries but for the scene to really gather momentum, large meetings with two sets of lights and enough personell to operate

them is what's required. In my opinion the course is also much safer should a failure occur. More so for the faster or heavier higher engine capacity classes In-line and F1s round the bottom turn back on to the straight. My experience from running a few of these shows has been that funds generated from a Public Display, is the only guaranteed way I can get the required button pushers and pay for the necessary equipment. I was hoping to commission a new set of lights integrated with timing lap counting for Cobram which would have reduced the number of marshalls by 40%.

My dream is to build a circuit of full on large racing events around the country. Three should be enough. There are a couple of new events in the pipeline that cannot be announced quite yet. The Championship in each Scale Racing category could be decided by the best result from two of the three meetings. Work has progressed to replace Cobram and the last weekend in May will be a two day meeting at the VMAA State field, forty minutes North of Melbourne CBD. The host club, NFG, has built excellent facilities and there is plenty of room for the course. Due to the propensity of those who haven't witnessed the spectacle to dismiss it as dangerous, and, having learnt the hard way that not everyone can visualise the concept, this meeting will not be a public display. The close proximity to Melbourne allows me to invite two companies interested in sponsoring the Sandown Meeting, to witness the racing. The main idea for Sandown is to promote the hobby and raise funds. Which will be used for equipment and to help build events for the Championship Series. Once they are established, funds can be used to bring overseas people to help raise the standard of competition flying and assist in funding World Champs teams.

RULES

Desirable as it may be, generating a set of National Rules seems to more trouble than it's worth. Entrenched thinking is a problem. The simpler the set of rules the better it is for competitors and officials alike. I am not on the sub committee, that is just my view and but I've grown tired of waiting. I will be watching the times between 30 cc petrol and 20 cc glo classes at Cootamundra with great interest. Has the 156 inch rule made Golden Era In-line into a one horse race? As happened at Adelaide earlier this year. Possibly, but the availability of one suitable glass and foam kit, the Mew Gull by Richard Mudge is certainly a key factor. There are a few other English designs that can be competitive but as far as the Mew Gull is concerned, there are three

RCM news
April-May 97

The magazine for the radio modeller

Number 24
Australia: \$4.95
New Zealand: \$7.95
Inc. GST

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Australia Print Post Publication No: PP3469310003

ISSN 1523-8702

The original scale concept and the 156 inch rule made American in-line designs American designs with wingspans under twenty feet uncompetitive. Aircraft such as Ian McLeay's lovely Art Chester Jeep (16'8") end up with similar cross section to the Laird Super solution and Weddell Williams

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flying that are posting consistent 12 second lap times. Richard Mudge with DL 85 engine, Michael Lynch with a DA 85 and Steve Turna with DA 60 up front. Garry Martelloni's 90 cc Sparrowhawk looked capable of that. As did Justin Reynold's DA 85 powered balsa/ply ARF Sparrowhawk, That was until he graciously found out the limit for a traditional wing structure, built without any composite material. That was 10.88 kg (24lb) at 250 kph.

The original set of rules used at Adelaide in 1997 were pretty good but the problem with interpreting the 156 inch rule harks way back to the inaugural Adelaide meeting, when two types of in-line models were presented for processing. Competitors with

a scale background built their favourite American designs, such as Art Chester's Jeep. Many of these racing aircraft had wingspan from as little as fourteen feet but sixteen to eighteen feet was commonplace. Then, there were those with a racing background who looked for the best model to meet the 156" rule. Accordingly, English designs with longer wingspans, around 28 feet, took out the first three places. DH 71 Tiger Moth (1st), Hawk Speed 6 (2nd), Hawk Speed 6 (3rd). Third place should have been a Mew Gull but two rounds with two cuts put paid to that.

F-1 has the same problem. The designs are easy and inexpensive to build, however, the current setup attracts complaints about hav-

ing to race against skinny models. A simple minimal cowl width would have gone a long way towards simplifying that problem. The Continental 0200 engine is 31.56 inches wide, (801 mm). At 1/3rd scale this works out at 264.5 mm (10.4 inches). Allowing for a little clearance around the cowl the minimum cowl width of 11 inches would work. Another problem looming is if the range of 55cc engines declines further. The logical choice would be up the capacity to 63cc.

Having taken into account complaints from competitors who no longer race, complaints from competitors who front up with models that don't meet the rules, competitors who don't read - or understand the rules, people who are uncomfortable with cash prizes, attracting and maximising value of sponsorship, an updated set of rules has been posted on the RCM News website. Any F-1 model that presents with a cowl that is under 11 inches wide will be subject to measurement against the three view. Any gross variations to scale will incur a time penalty. Seagull Nemesis and Hangar 9 Sundowner ARFs are eligible as is, and the Sundowner is exempt from the minimum cowl requirement.

Participants who can demonstrate the ability to operate safely in cross wind conditions, may be eligible for an invitation to race at Sandown, Where \$2000 prize money has been made available. None of this rules guff is new to me, but, in addition to running an event and help grow the scene, I'd also like to race a scale racer. In a scale race meeting, against competitors who are there just to race and see how their setup competes. After waiting sixteen years it's still bank then yank, but for me, the test for this column is how many entries Melbourne attracts. I was banking on a hundred at Cobram. Now I am banking on this magazine's ability to promote events.

Just like Dad did back in 1997, when RCM News got right behind the original concept.

RCM news
June-July 97

The magazine for the radio modeller

Number 25
Australia: \$4.95
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ISSN 1122-5752

9 771323 579006

Modellers with a racing background turned up with English designs and blew the American stuff into the weeds. Bruce De-Chastel's DH 71 Tiger Moth took out the first place in 1997. The Miles Hawk Speed Six placed second and third

2014 RACE CALENDAR

Gratton Air Invitational (QLD)

(Categories TBA) 26-30th March

Wallan 5000 Vic (Vic)

All categories May 24-25

Gold Coast 5000 (QLD)

All categories July (TBA)

Great Texan Race (Vic)

Bendigo Vic August (TBA)

Texan - Red Bull - F-1

National Air Races Cootamundra (NSW)

All categories October 26-26