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ROTORUA MODEL AIRCRAFT CLUB (INC)

October 2021 NEWSLETTER

Secretary Andy Watson

Email: top.place@xtra.co.nz
Ph 07 357 5656

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Sub for the 2021 - 2022 year are	RMAC	MFNZ	TOTAL
Family	$120	$100	$220
Senior	$115	$95	$210
Junior	$45	$30	$75
Associate (member of another club with current MFNZ membership)	$115		$115
Social non flying	$50	-	$50

Payment can be made to ANZ account # 116102_ 0913131_ 11 Include your name in the details

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Welcome to the October 2021 newsletter.

Trusts Come To the Party

As reported last month the committee decided to replace the small mower with a larger model with a bucket and spray unit. Thanks to the Rotorua Trust and The Aotearoa Trust and a top up from our funds we now have our new mower.

The sprayer and bucket are somewhere between here and Melbourne and will be fitted when they arrive.

MFNZ have funded the anti wild pig electric fence. Materials are being sourced and we should see something soon.

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And even more good news. We made an application to RDC Community Grants scheme recently and have acquired an annual operational grant for the next three years! This will help pay our rent and insurance.

Letter to the club from Dave Monty

Mon, 4 Oct, 16:04 (3 days ago)

As a member of the club who has had a bit to do with funding I can testify too how well The Committee has done collecting funding for our model club. In the current world of Covid I am amazed and amused at how successful they have been. When you next see them you may wish to pat the lads on the back.

Dave Monty

Flying activities have kicked off again after the latest Covid lockdown. A good turnout on the 19th saw Dave Bailey's Tipsy back in the air repowered with an OS FP 40. It now takes off after a very short run and has plenty of get up and go. After having a fly of this model I've started one myself. Also to be powered by a 40FP.

Captain Monty has taken to his Spitfire with a knife adding a section to the nose of the fuselage. This has resulted in the removal of a big hunk of lead from the nose. The model is now lighter and back in the air.

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THE MODIFIED MODEL

There was to be a Vintage meeting at the Airsail strip on the 19th but within the Auckland boarder still at level 3 this meeting was cancelled. Vintage fliers were not disappointed as Septembers NDC event was 1/2A Texaco. John R and Dave L managed to find some excellent thermal activity and recorded some very competitive times.

Tom To The RESCUE AGAIN!

Last week Brian S had a wee problem with the jungle and after a search the model was no where to be seen. Luckily Tom had his drone out on Tuesday and the model was soon located in the top of a gorse bush. It was a simple matter to cut a track into the gorse and the model was retrieved within 10 minutes.

We now have some excellent new radios for use in searches. Any committee member can access them for you.

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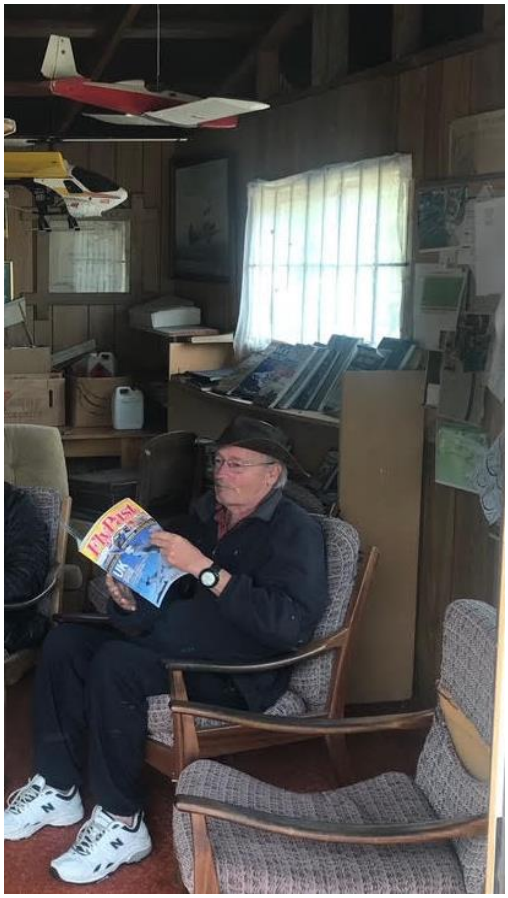

We were recently saddened to hear of the death of Ted Coppard.

Ted and his two sons were members of the club for several years until the boys went off to university.

Although not a flier himself Ted was very supportive of the Club.

We were lucky to catch up with Ted when young Chris was home for Christmas from Australia.

The Clubs extends its sympathy to Ted's family.

Optical Rev Counter

My dabbling into the world of Aduino has now produced somethig useful. A rev counter. It is based on an Arduino Naro and an LCD display. An LDR changes resistance every time a prop blade goes past and forms part of a potental diver which is AC coupled to an op amp acting as a comparator. The output of the comparator is a string of pulsed which are counted by the Arduino which is programmed to converted the pulses to rpm displayed on the LCD display

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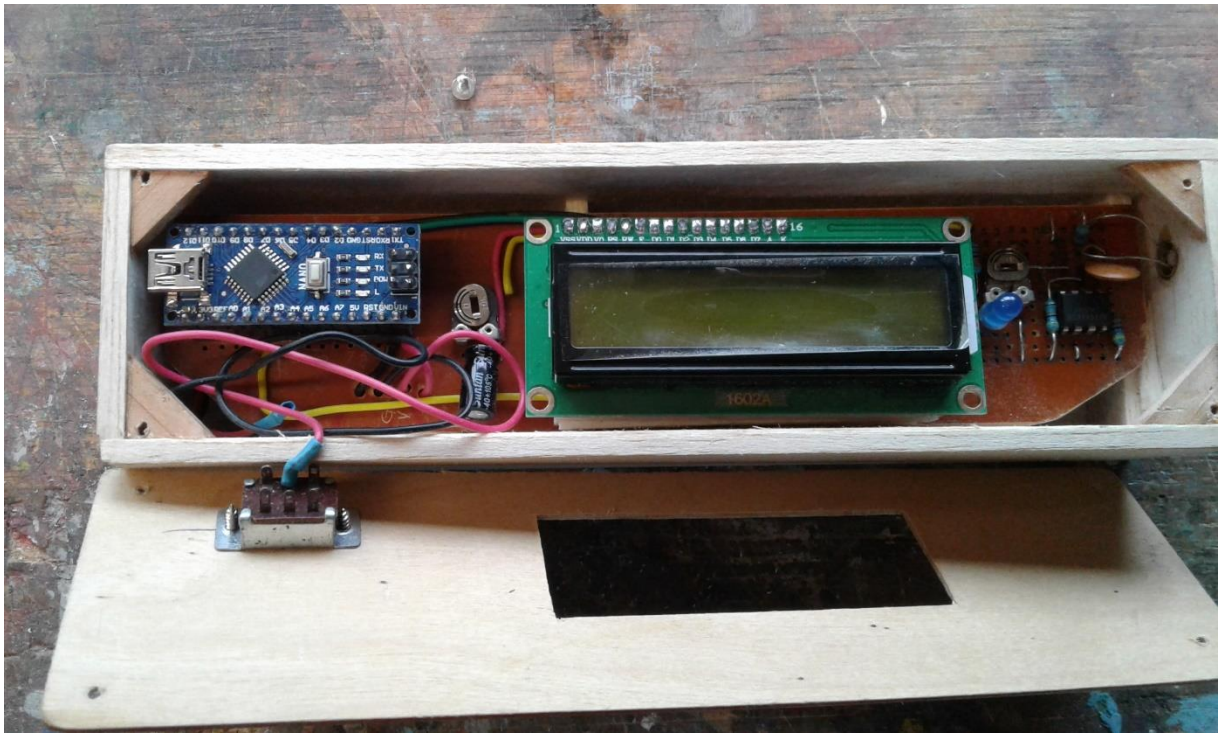

Inside the box

On the left is the Arduino.

In the centre is the LCD

On the right is the op amp comparator and LDR input.

My next project is to play round with a data logger and graph the info.

The Pres Says

There have been some strange changes with the attitude of the club neighbours this month. On one Sunday there was a very aggressive confrontation with the neighbour concerning the horses that roam around the flying field boundary.

They had got onto Mead Road and he came over and was blaming the club for leaving the first gate open. This despite that the horses were out there before the gate was opened by the first member there.

It looked like we were being forced into keeping the gate closed at all times.

Ten days later however the situation changed considerably when another of the neighbour group visited the club house on a Wednesday and spoke to the same first early morning member. This neighbour apologised for the previous confrontation and reported that the horses had now been moved. In future they would be confined to Julie Gilmour's paddock (down Mead Road) who is responsible for them and leases the grazing in that paddock. The gate could therefore be left open when we are there!

So, the situation is as before… Last to leave must lock the gate but it can be left open when we are there.

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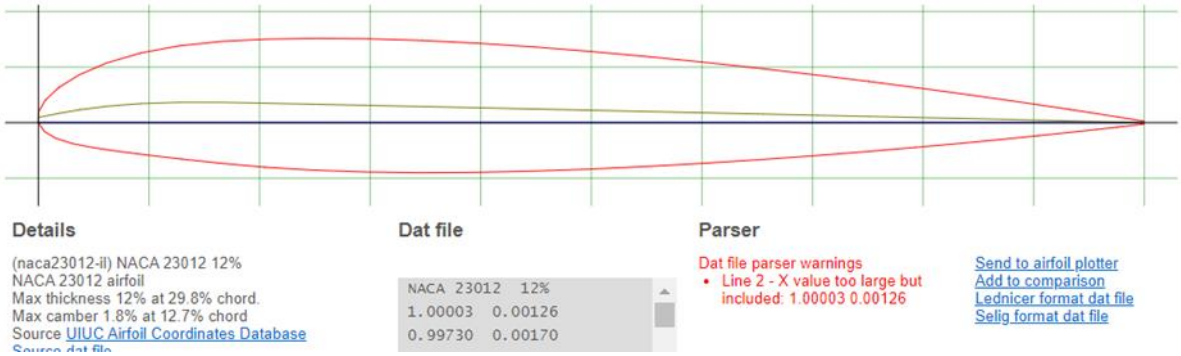
I hope that this continues, but my experience of the last few years with these horses suggests that they will soon be roaming again.

The pig fence is still a work in progress. The details are being finalised. Thanks to Howie Evans for responding to my plea for a Farmlands card in my last report. We will be using his card to get the materials soon.

Did you read the notes by Fraser Briggs on throttle trim set up in the latest MF World? I hope so, because they are very relevant to all those of us who use IC power. I knew about the optional use of wider trim movement settings on control surfaces, but never thought of using them for the throttle. As Fraser writes, the use of idle up on your Tx makes it easy to minimise the risk of a dead stick in flight when you close the throttle. Switch on the idle up before take-off, which does as it says and sets the idle at a higher position, and then switch it out for landing, so simple when Fraser describes it as he does.

Here is the second part of the giant scale article on airfoils for aerobatic models. I will definitely be using the NACA 23012 on my next model.

Here is the actual aerofoil from a google search. You can see the camber on it and the lack of full symmetry that the article refers to, also the differences in %chord location of thickness in the bottom and top surfaces



How do I find the proper C.G. on a model when prints or information as to its suggested location is not available? On a constant chord wing it would simply fall 30% back from the leading edge of the wing. On a tapered wing it requires a bit more planning. Start with a point 30% back from the L/E at the wing root. Next go to the tip and establish a point 30% back from the L/E at the tip. Strike a straight line between these two points. We will call this line (A). Next, measure the length of the chord at the wing root. Establish a point using this measurement directly in front of the very tip. Now, measure the tip chord, and place a point using this measurement directly behind the center root rib. Strike a straight line between these two points. We will call this line (B). If you now extend a line outward from the C/L of the fuselage exactly 90 Deg. to the point that (A) and (B) intersect, you will have a 30% C.G. position established. This will work regardless of wing taper configuration, and does the same even on swept wings. If you have a biplane where the wings are staggered, it requires one more step. Strike a line from the intersecting point of (A) and (B) on the top wing, down to the same point on the bottom wing, then measure half the distance of this line. Now the 90 Degree line from the C/L of the fuselage should intersect this half way point, to establish the proper C.G. location. The only wing plan form that this method will not work is on an elliptical wing such as the Spitfire, or the Cap 20L.

BIPLANES

Most full scale aerobatic biplanes such as the modern Pitts design use a full symmetrical airfoil, same as the monoplanes described in the preceding paragraphs. Models have followed this trend and practically all of the biplanes available today employ a symmetrical section, only varying the percentage of thickness in the airfoil. Reasoning behind this, as with the monoplanes, they perform equally well in positive or negative "G" maneuvers. One thing that especially came to the forefront in the earlier days when engine size available determined the size of the biplane, they were by no means capable of a "Ballet" type performance. I attribute this to several factors such as lower aspect ratio wings, constant chord wings, short moments, more drag, etc. Wing loading (Wt. per Sq. Ft. wing area) on biplanes cannot be applied in the same way as monoplanes. For instance a 32 Oz wing loading on a monoplane may make it an ideal aerobatic machine, while a 32 Oz. wing loading on a biplane will not offer the same degree of forgiveness.

I experienced this "Dragonfly" characteristic in my first attempt at biplanes with a Pitts S-1S model that I built in the early 80's. I never did crash it, and it still is in a friend's workshop in flyable condition today. It did not however enhance any flying ability that I had acquired at that time. Later on in the 80's I became infatuated with another biplane built by Kermit Weeks for full scale IAC competition. He first built a "Weeks Special" and it was basically a rework of a Pitts S-1S. Kermit made the following changes in relation to the Pitts. He swept the lower wing same as the top wing, took out all of the bottom wing dihedral, and both wings were mounted at 0 deg. to the thrust line. In his first international appearance with the Special, he placed second in world competition. Not satisfied with being second in the world, he then built an entirely new biplane from scratch, and called it the "Weeks Solution." This turned into a true winner and he accomplished his dream in winning the world IAC championships.

The Solution was my choice for my next biplane, and I did a lot of research before finalizing the prints. Uppermost in my mind was my theory that the lighter the wing loading, the better the aerobatic performance. Another way of achieving this desired lightness was to consider a non symmetrical airfoil that would handle the weight better, while not interfering with the negative "G" performance of the aircraft. This led to more research into the airfoil subject and I found that another prominent name in full scale competition came to the surface. The late Leo Loudenslager had designed a monoplane called the Laser 200 and proceeded to win 1st. in IAC world championship competition. The airfoil used in the wing design was an NACA 23012. Henry Haigh later on also used this airfoil on his Superstar to win 1st in IAC competition. This particular airfoil was a semi-symmetrical section where the thickest part of the rib from the thrust line up was at 25% of the chord, while the thickest part of the rib from the thrust line down was at 40% of the chord.

I made up my mind that this was going to be my airfoil of choice for the new Solution, and I am not at all regretful of this selection. The 23012 semi-symmetrical section choice, along with sweeping both wings has produced a model that is fully aerobatic, yet has as much forgiveness as any trainer that I have previously flown. The speed envelope on my present Weeks is 108 MPH top speed, and 10 MPH landing speed. The 23012 airfoil has none of the characteristics shown in other semi-symmetrical sections, and is just as much at home inverted as upright, as well as in negative "G" maneuvers. An-

other advantage to this airfoil is that it is much more efficient at handling weight than a full symmetrical section, and would equate to a 20 Lb. full symmetrical model flying like a 17 Lb model when the 23012 section is applied. Also having both wings swept on the Weeks contribute to the stability of the model. A common description of sweep in the "Old days" was 3 Deg. of sweep equals 1 Deg. dihedral, and it works the same both upright and inverted. I am not able to back up these numbers with researched facts, but I can definitely state that it works.

The positioning of the wing, stab, and engine in relation to the thrust line of the biplane has as many different interpretations as there are models on the market. The Weeks is designed with the thrust line of both the top and bottom wings, as well as the engine mounted at 0 Deg. in relation to the thrust line of the fuselage. The stab sets at 1-1/2 Deg. positive, which lets the model fly "On the step" and presents a very clean target with the minimum amount of drag. Mounting the stab at 0 Deg. to the thrust line causes the model to fly in a "Landing" configuration, and I can spot one flying in a minute that the builder did not follow the 1-1/2 Deg. positive route when mounting the stab.

This paragraph is not directly associated with airfoils, but has a very definite bearing on a model's performance. I am a firm believer in built up wings with open bays, rather than full sheeted, for aerobatic purposes. I have tried both configurations on the same model, and while the high speed characteristics do not change much, it definitely effects the stall characteristics and landing speed of the model. I can remember full scale pilots in prior times complaining about the same characteristics when they had their "Rag wings" replaced with metal ones. Many of today's model designs use foam wings and I notice some place cap strips between leading edge sheeting and trailing edge sheeting to give the open bay effect. I am not familiar enough with foam wings of this type to comment on whether this is for looks, or makes it more efficient. While on the subject of wing design, let's discuss aileron hinging for a moment. Some models show center hinging the ailerons, while others revert back to the top hinge style of mounting. On the Weeks, I use the top hinge method for the following reasons. First, all aircraft, especially aerobatic aircraft require a certain amount of differential aileron deflection in order for them to roll on their axis rather than to "Trade wingtips." Differential in this case means more up than down. When hinging is done from the top, the "V" that results when we taper the leading edge of the ailerons, top to bottom, to provide travel clearance, we present less surface on the down aileron position, than we do the top. This results in differential, but may still require a bit of fine tuning on the transmitter to achieve ultimate roll performance. Regardless of the style of ailerons, the gap must be sealed between the leading edge of the aileron and the trailing edge of the wing where they mount. Sealed ailerons make them much more efficient, resulting in requiring less throw for the maneuver desired. This also produces a much cleaner aircraft in vertical rolls. The less aileron deflection in vertical maneuvers keeps the ailerons from creating unnecessary drag. Even though one aileron is up and the other down, they still work as brakes when activated.

In finalizing this article, the impression that I wish most to leave with the readers, is that this is a brief history of my experiences in the modeling field. If any of my suggestions are in conflict with your current model, it simply means that the designer took a different approach, and I sincerely respect the methods that he used to achieve his goal.

Miles

"I am a firm believer in built up wings with open bays, rather than full sheeted, for aerobatic purposes. I have tried both configurations on the same model, and while the high speed characteristics do not change much, it definitely effects the stall characteristics and landing speed of the model."

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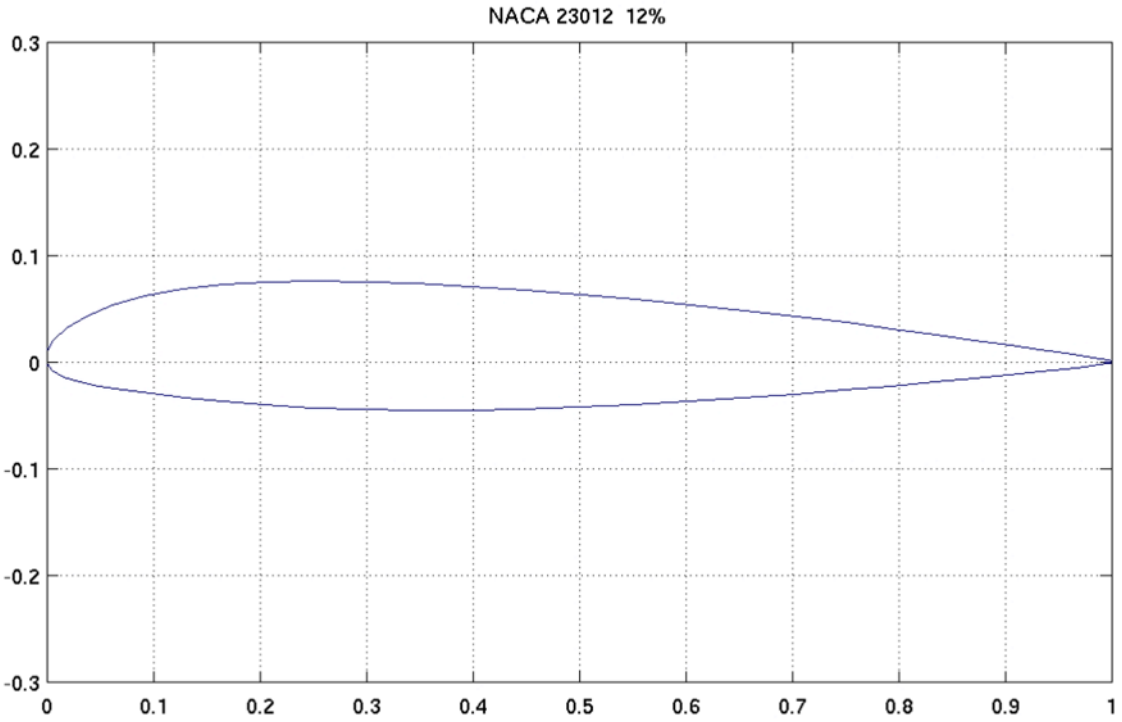
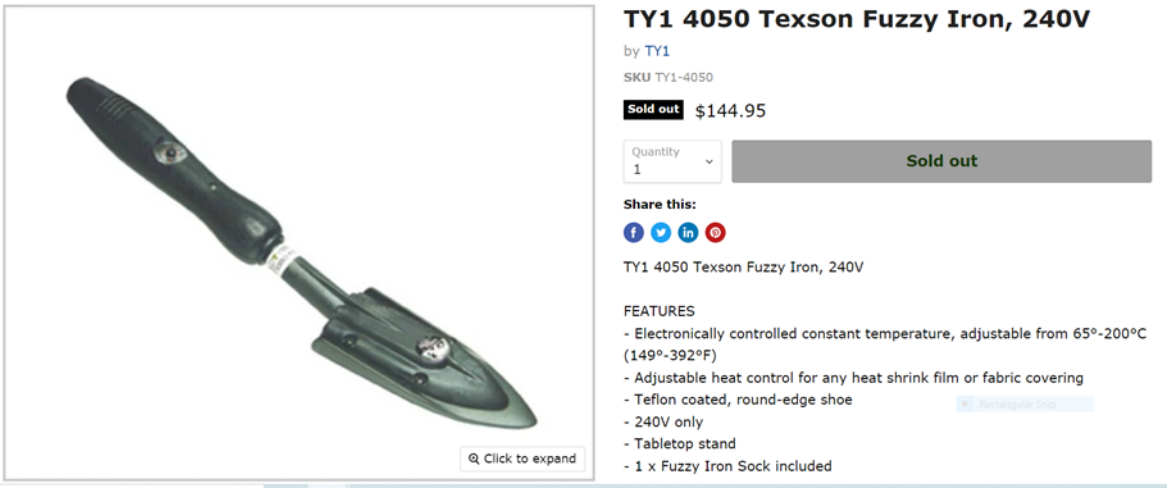
Below is a picture file of the section from the UIUC reference shown above. This could be used to scale up or down with a photo copier to the chord required. The brightest of us could of course plot it accurately using the data file co-ordinates also available. I will stick to scaling!



Personally, I have often wondered if the precise shape of the aerofoil is really that important to most of us that fly model aircraft and could we really sense the difference. All the basic ARF's seem to use a standard fully symmetrical semi symmetrical section. However, if one is building from scratch and you have to cut ribs anyway, it is always more interesting to try something that might be a little better. There is only one way to find out and that is to try it.

From the Allistair Laing Estate. (Sale on behalf of executors)

Film Iron, still in its box, but no sock or table stand, probably used once by Alistair on his crashed Kadet. $50



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Arising Star trainer

Fitted with new Futaba Servos, SC 40 engine, minor hangar rash damage. Raised fuel tank for extra reliability. $60, just needs battery and receiver

Another trainer

Fitted with new Futaba Servos, OS 25 FSR engine. Needs battery and receiver.

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If you are interested email David Thornley

COMING EVENTS

Issue 146 of the AVA (vintage) newsletter can be downloaded from the MFNZ website. l

October	23 - 24 Tuakau MAC	Vintage
November	20 - 21 Thames Blackfeet	Vintage
	20 Scale at Matamata	
February	12 Scale at Matamata	
	26 - 27 Airsail MAC	Vintage
March	19 - 20 Awatoto (TBC)	Vintage
April	9 - 10 Thames Black feet	Vintage
	21 Scale at Matamata	
May	21 - 22 Tuakau MAC	Vintage

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