

ROTORUA MODEL AIRCRAFT CLUB (INC)

DECEMBER 2022 NEWSLETTER

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AOTEAROA
GAMING
TRUST



Rotorua Trust
MŌ TĀTAU KATOA



MERRY CHRISTMAS AND HAPPY NEW YEAR

Welcome to the DECEMBER 2022 newsletter

The Committee extend their best wishes to all for the Christmas / New year season. May you get that new model, engine or radio from Santa and some fine weather to go flying!

Not a lot to report this month as weather conditions have been pretty terrible again. The Blackfoot fliers Vintage meeting postponed till 19th Dec ended up being cancelled because of the weather. On the local scene there has only been a couple of good days for flying. We have managed to keep the strip mown although it is very soft in one or two areas.

The B B Q planned for this Sunday has been postponed till January (date to be advised) on account of the weather prophecy and covid.

We have managed to harvest and sell some of our Christmas trees and swell the bank account.

March 19th has been fixed as the date for our 75th anniversary fly in.

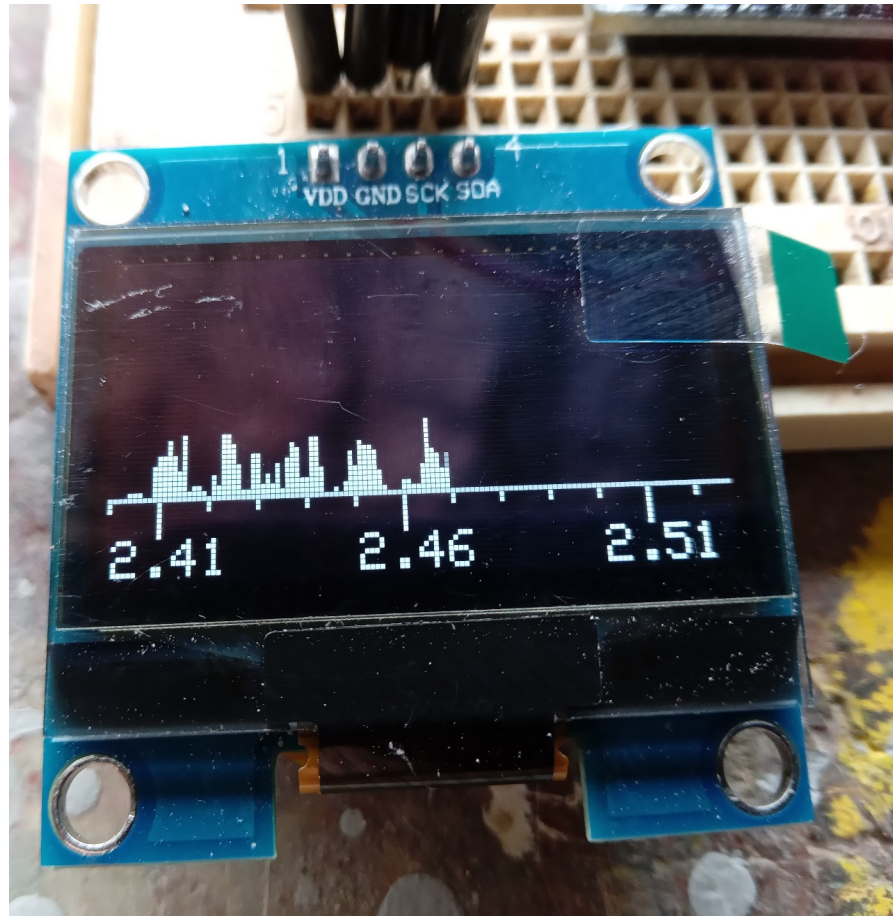
Feather on is an excellent article on batteries. If you read nothing else read this article. There is some excellent information here.

On the flying scene Tim is now solo and Andrew not far behind. A couple of fliers have recorded time for the international Tomboy postal event. We have until July to record time for this event so no doubt we will see more entries.

Ever wondered what frequencies your transmitter uses

With plenty of time in the shed lately I came across another Arduino project on the Mode Zero Forum. This is a scanner that displays the frequencies in the 2.4Ghz band.

The picture above is the



output of a Futaba J10 FHSS transmitter.

2.4000GHz – 2.4835GHz is allocated to model flying in NZ.

It will also pick up Wifi and Blue tooth signals and it's interesting watching how the use of the band changes as with some of these devices.

Choices....

Club Captain stuff.... By Ray..

If you're a techie then this is not for you... Its for people new to Electric Flight.. Its about as basic as you can get... No formula, No Math.. No tools required..

So !, you have decided to join up and go fly RC or for that matter as an existing flier you might be considering different power plant options that may suit you better.

Not everyone wants to be knee deep in glow fuel, nitromethane and oil.

If you don't that's fine but let me tell you your missing on a great experience.. its almost a right of passage in the RC power world.

What are the options.. well basically these :

Glow fuel engine (excellent all around up to say medium size aircraft... thereafter expensive on fuel)

Petrol Engine. Usually better suited to medium size and up, although we are seeing some small ones now.

Electric (prop or ducted fan)..growing in popularity, perceived as being simple clean..its not. Read on.

Turbine. Fantastic technology.. RPM 175,000, idle at 50,000 rpm.. expensive and not for beginners.

Jet (rocket).....but lets not go there..

In my time as an RC flier since 1976 I have been lucky enough over the years to have tried all except the jet (rocket).

They are all, without fail, good fun..

So as they say lets cut to the chase..

This article is about ELECTRIC flight basics and why it may not be quite as simple as it first appears for newbies..

Lets start with the batteries... and their charging systems.. this is the area where there is a tendency to try and burn your house down if you don't do it right....

Be WARNED this is not paranoia we have had two members that have had quite serious fire damage to their houses in recent times.

That's the essence of what this article is about.. electric and fire safety.. (read... FIRE, Explosion, hot metal and oxygen).

In the main we are going to stick to two items in this particular article..

Batteries.

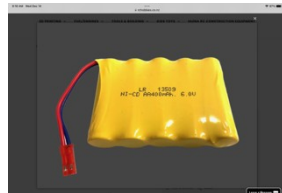
Chargers

Batteries..

There are some common batteries you will come across in RC flying..

They are..

NiCads... mostly gone now but some suppliers still have.. best suited to radio equipment and not big motors... probably best to avoid these days.



Nickel Metal Hydride. NiMh The current 'go to' battery, generally considered a "safe" battery ...(no battery is completely safe)

It is wise to use pre made RC packs that are tagged and spot welded rather than the plug in standard cells.

The workhorse for most radio and flight gear today..used in transmitters and airborne systems, receivers etc..

Also used on petrol engines for electronic ignition power.

Not usually used for electric motors, at least not for the medium to large. You may see them on motors for some of the very small kitsets..

These days they tend to be five cell.. ... 6 volt.. **caution**: when freshly off the charger this six volts can be much higher..(surface charge) if you have some old servos or receivers they may not like those extra volts.. remembering that the earlier radio gear was all built around 4.8 volt (4 cells).

Important point.. NiMh come in different "classes" such as light duty, medium and heavy duty.

Each has a trade

off.. seek advice as to which is best for you.

One, well actually two brands excel in in this category.

Sonya and Panasonic..(well, actually related these days). There are of course others

Known as Penelope branded batteries.

They come in different colours and different ratings..

Blue (light duty): Suits very small setups.

White (medium). : medium current but can have up to two thousand cycles.(with luck)



Black (heavy duty): high current , typically 2500 milliamp hours BUT five hundred
Pick to suit your needs.

One point I will try to hammer home in this article is how important it is to read the data sheets that come with your gear. (You know those little bits of paper that came in the box and are probably still in the box 😊)... The rate of technology change at this time is mind blowing..

If you listen to empirical advice from around the club you may well be getting 'old school' advice which may or may not be the best for your setup.'

"RTFM".....[READ THE BLOODY MANUAL].... Simple, they designed it, follow their advice...

Some advice from some grey beard around the club may be well intentioned but may not be the best way to look after your nice new modern equipment.

That said, most Clubs tend to have one or two well experienced Fliers in certain disciplines.. you know the Glow engine guru, the petrol head and the electric

guy....find that person for your type of power plant and you will probably get good advice... even so.....RTBM.

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Back to batteries..

Lithium ...

Just because the word Lithium is attached doesn't mean its going to try and burn your house down.

In fact many Lithium battery fires are a result of abuse in one way or another.

Lithium batteries are every where.. phones, watches, Ipads, Laptops and yet we barely think about them.

We barely give them a thought when we stick them on charge all over the house every night.

In RC flying we come across several 'flavours' of Lithium batteries..

The most common are..

Lithium Polymer the 'LiPo' battery..... The "power house" of batteries for electric flight motors. We use secondary lithium cells (re chargeable) and this is where we see the word ion appear.

A primary lithium cell (non rechargeable) actually contains lithium metal, however, we're not going to discuss in this article..... anodes, cathodes and electrolytes. We



can do that another time

Lithium Ion.. found in some radio transmitters today.. mine for example..Power Box Core.

Lithium Iron Phosphate LiFe PO4 (note the words. **IRON and ION** ...different but related technologies, can be confusing when discussing.. so the LiFe PO4 is usually just referred to as a "LIFE"battery (its just easier)

This is the "good guy" of lithium batteries.



There are others and its constantly changing but these are the ones you will most likely see around the club for now.

Now within each of these types we see all sorts of variations such as Nano Technology, Graphene, dual voltage, high voltage, BMS inbuilt, intelligent systems and so on.

They are NOT all born equal....(RTBM.)

A quick run down on some typical uses..'

Lithium Life batteries... (LiFePO4) generally very stable, output voltage suits radio gear without having to use regulators. Doesn't mind being fully charged.. not so easily damaged. Light weight.

Great battery for the flight systems on the model.

Can deliver quite high power however it is not the best power density for larger electric motors.

Still needs to be treated with respect as it has quite high power density..

Lithium Ion..found in some transmitters and flight systems. Widely used in phones, Ipads etc etc.'

Not so widely used in RC yet but is starting to show up in some systems.

Lithium Polymer... (LiPo) the power house battery. **Your motor battery...!!**

This is the beast that has the reputation.. ___ is the reputation deserved ?. In many cases of fire or serious failure often can be attributed to accident, abuse, mishandling and ignorance of the instructions. (Yep, RTBM)..

Lets try and get some perspective on just how powerful these small batteries are here.. a small Lipo, like I have for my motorbike jump start can deliver well over 400 amps... that's a large welder type current for a minute or so.. that's a fire starter. No, that's a potential fire bomb..

That's what you have in your model aircraft.. you better know what you can and cant do with it.

It is important not to abuse your batteries (any battery) particularly lithium polymer.

Lithium polymer batteries are expensive so it's in your own interest to look after them. Follow the instructions that came with the battery to ensure you get the best life and safe use.

It's not unreasonable to ask what is "abuse" in this context..

Usage abuse.. some examples

Not putting it into storage mode when finished for the day.

Overcharging battery..[timewise]... (potentially dangerous)

Discharging the battery completely.. (can kill the battery)

Using too high a charge current .. (overheating may cause a fire / explosion) ... RTBM..

Not setting the cut out timer.

Not setting the capacity level to match battery.

Not using balance mode.

Not using (buying) the optional thermal sensor which cuts out when battery gets hot.

Not putting it in a fireproof container.

Charging or discharging at a rate other than what the manufacturer recommends.

Physical abuse...

Dropping your battery.

Throwing it into your flight box with the other junk and tools.

Pricking it with a needle to "let the gas out" very, very dangerous.(yes we have seen it done.. about as dumb as you can get, unless you like reconstructive facial surgery)

Using a puffed battery.

Using a physically damaged battery post crash etc..

Mostly common sense think of this particular battery type as a potential fire bomb.

Just treat your gear with respect.

So just where is the worry..?

I believe many of the issues that we have seen relate to chargers more so than the actual battery chemistry.

When you buy a very simple small entry-level Model Aircraft, it often comes with a very simple charger much like a plug pack and very small batteries and there's



nothing for you to adjust, it is relatively safe.

The issues seem to start once people want to use what might be referred to as a smart charger. These chargers are amazing given how cheap you can buy them today and the features they have.

However, they do come with a need to fully understand what you can and can't do with them.

The onus is entirely on you to set up a smart charger correctly. Seek help if you don't know..

Nearly all smart chargers come with safety features, the safety features must be set correctly by you to suit your equipment. Failure to do so can result in overcharging and the resultant fire...

I cannot stress this enough you must set the safety features that come with



most smart chargers.

Often new smart chargers out of the box are set to maximums which can be very dangerous.

Nearly all smart chargers come with certain basic safety features probably the most important one is the timer.

This is much like an egg timer, and when that time is reached, it will turn off irrespective of the charge state this must be set correctly to avoid overcharging. This is your 'last chance' safety feature.

It is important to realise that the smart charger is doing "things" by itself. (That's why it's called a smart charger) One of its tricks is to know when to change how it charges the battery.

It uses two main methods to charge, one is called Constant current and then switches all by itself to constant voltage.... Most timesMAYBE !! (Another more techie article one day)

Hence why the timer is so important as is capacity and thermal detection.

The automatic system works fine most of the time but battery issues can affect and confuse it.

It is also obviously reflected in the grade of charger.. A cheap \$50.00 charger may not be as reliable or as clever as a \$500.00 charger.. best bet, set that max current and timer... at the very least..

IMPORTANT: ALWAYS charge and discharge in a fireproof container and in a safe area.

A Lithium battery fire is a very active process and it will throw bits of flaming battery some distance.

I also use a house fire alarm sensor on the battery bag to early detect issues.

Its not a bad idea to have a bag of dry sand handy as the fire is very difficult to put out other than by removing all oxygen.

Many guys use the BBQ , old roasting dish or similar.. in addition to the fire-bag.

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There's also usually a capacity setting That you can set to match the battery capacity to make sure the charger does not try to deliver anymore than your battery is capable of holding.

There's usually the charge rate setting that is 1C, 2C, 3C. Many people use 1C because they believe this is the way to do it, (it was once) once again RTBM.... in my own collection I have some batteries that recommend 1C and several that recommend 2C or 3C to ensure the battery is at a suitable temperature to accept full charging. You can no longer guess based on yesteryear.. Read the manual.

CAUTION: you will see on some batteries figures like 35C, 50C or even higher these are NOT charging rates they are discharge rates and there are different types (constant, burst, etc) so be suspicious of anything over say 5C in regard to charging.. RTBM..

Of course talking 1C, 2C, 3C doesn't mean much if you don't understand what that means.

In very simple terms it is the charging rate as per the battery capacity lets say a 2000 mA (mA is a milli amp or 1000th of an amp) hour battery at 1C will be charged at 2000 mA from "flat" in about one hour (caution: never flatten your battery) if you were charging it at 2C it would charge at 4000 milliamps. obviously it will charge more quickly in fact, in about half the time of a 1C charge.

Of course you should never flatten your battery in real use unless you like buying new batteries.. they don't like it and they can die.

Note: you should never be charging from flat.. ideally your battery is sitting in storage mode so is already sitting at about 40% charged.

Lets talk 'Storage mode'.. this is what you should use every time after flying.. this is a largely an automated charge or discharge to about 40%... of capacity...think of it as letting some air out of the tyre or putting some in to get the right (safe storage) pressure. It also balances the cells.

You should always use the "balance mode" when charging or discharging as it will look after the battery cell levels for you.

Battery cells inside the battery pack need to be in balance with each other to quite a high degree. Like fractions of a volt..

Balance mode will do that for you.

Unless you know what you are doing never do an unbalanced charge (usually just called Charge) or an unbalanced discharge (usually called discharge).. its too easy to get into trouble. Leave that to the experts or at least until you fully understand what the implications are.

Quick note.... you will also see the S numbers.. 2S, 3S, 4S and so on this relates to the overall battery voltage which is made up of cells in series ..eg a 2S battery has two cells in series to increase the voltage 3S has three cells and so on.. some times you will also see a P .. this about parallel cell use like S is for cells in series. Eg 4S2P..

We'll talk about that another time..

If your still here well done....

This non technical article is for the new electric flier.. but it doesn't hurt for all of us to re fresh from time to time..

Now you know what bits are what... next time lets look at how it actually works..

Volts, Current, Power, resistance, impedance, internal resistance , yawn, yawn, yawn if you want to be good at electric flight there's heaps to learn and have fun with.

I leave you with this thought.. take it seriously.

ELECTRIC FLIGHT IS PROBABLY POTENTIALLY THE MOST DANGEROUS OF THE DISCIPLINES IN RC.

ALWAYS ALWAYS DISCONNECT THAT BATTERY AND STAY CLEAR OF THE PROP AT ALL TIMES.

ALWAYS SECURE THE AIRCRAFT AND DO NOT TRUST ANY SOFTWARE or RADIO SWITCH....

IF YOUR NOT SURE PLEASE ASK US,YOUR FINGERS MAY THANK YOU..

FOR SALE

- Restored Skyrader complete with ASP46 and servos.
- All set up and test flown. Just install your receiver and go flying



For details. contact

Contact Dave Little 027 784 8773

Auckland Free Flight Gala

Saturday 11th Feb 2023

Proctor Road, Te Hoe, Waikato

Start 0900, finish 1400, awards and flyoffs to follow



A1, P30, E36, 1/2A power,

Kiwi power, Coupe, Mini Vintage*, all 3 x 120]

and Catapult glider, 6 x 60

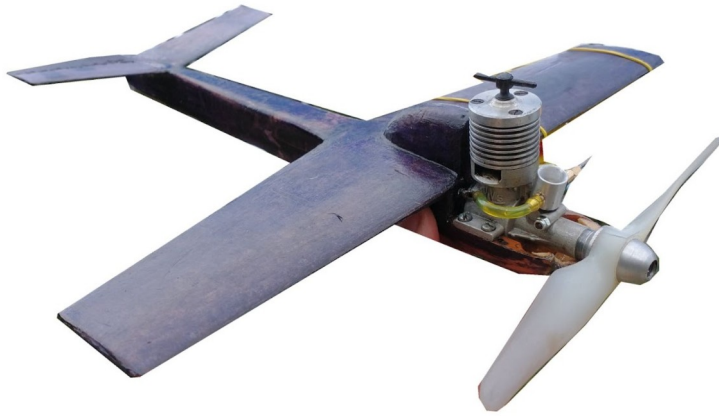
Entry fee \$10 for the day and any number of events, juniors free.

***Mini Vintage** – Combines

- i) Miniature Replica .
- ii) Gliders to 50 inch span.
- iii) Rubber up to 36 inch span

Organiser - David Ackery, email david.ackery@xtra.co.nz

Join us during the



75th Nats

and nationwide as we
celebrate aeromodelling history with...

Vintage Speed

Fly Fast, Turn Left

and have some fun.

Bring out your Midge, Phantom, Shimid, Perky, Classic Team Racers, old Goodyear models
and whatever you can fling around and we'll see how fast they can go.

Any 1940s, '50s, and '60s style models with non-Schnuerle ported engines

No pylon, no whipping, handle near your chest, fly over grass - easy!

Enter and fly any time during the 75th Nats or from anywhere in NZ via video

Chase the best speeds of the last 12 months for a Percentage Speed type score across
these categories:

- 1/2A - 1.5cc PB engine, 10.67m lines, 6 laps (¼ mile)
- A - 2.5cc engine, 15.92m lines, 10 laps (1km)
- B - 5.0cc engine, 17.69m lines, 9 laps (1km)
- Open - anything that fits any MFNZ CL class - chase your personal best for 1km.

We'll keep the contest rolling for as long as people want to fly in it and update quarterly like
NDC

Beginners Welcome! We'll help you have a go.

For more info contact Adrian Hamilton: ashcustomworks@gmail.com phone 021 137 2376

Vintage Speed

Introduction

Vintage Speed is an informal "postal" style of contest where we will fly racy models of the '40s, '50s and '60s style, time the speeds over the set distances and tally the results as a percentage of a 12 month rolling benchmark. The three main model categories are based on the established MFNZ classes of Midge Speed & Phantom Racing and Classic A&B Team Race but with a broad allowance for other classic or vintage-styled speed and racing models of comparable specifications.

Entries can be submitted in person at the Nats or via email to the Contest Director for inclusion in the results table, starting with the MFNZ 75th Nats. This first round will last for the duration of the Nats, 2nd to 6th January 2023, with results accepted up to midday on the 6th so that results can be announced at the CL prizegiving. After the Nats, Vintage Speed will continue as a quarterly postal contest run by NOCLASS MAC.



Flights

Fly your model at any point during the 75th Nats, anywhere in New Zealand, either with a suitably experienced timekeeper present or video your flight and upload it to Facebook or Youtube and notify the CD. Enter up to three flights total with a maximum of two attempts in each category. Your best in each category will count.

Timing commences one lap after you bring your handle to your chest or chin and it must remain there for the duration of the timed laps. If you want to nominate that a flight in an official event (such as Classic TR) be timed for Vintage Speed, we can just time a suitable portion of the flight as you race.

Categories

1/2A - 1.5cc Plain Bearing, non-Schnuerle engines in models like the Mercury Midge, KK Phantom, Weatherman, NAC Special, Airsail Sportsman and similar. 10.67m lines, timed for six laps (¼ mile).

A - 1.51-2.5cc non-Schnuerle engines in models such as Classic A and Goodyear racers, Perky, Weatherman and similar. 15.92m lines, timed for ten laps (1km).

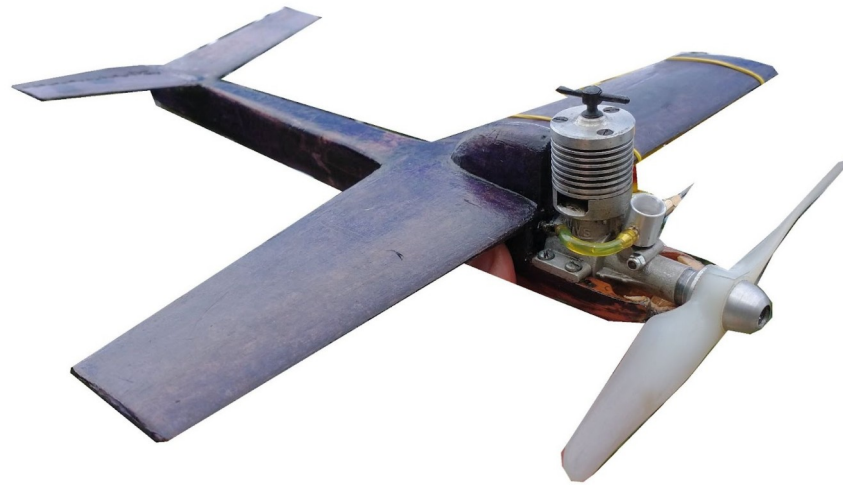
B - 2.51-5.0cc non-Schnuerle engines in models such as Classic B and Goodyear racers, Weatherman, Proto Speed and similar. 17.69m lines, timed for 9 laps (1km).

Engines

Engines must not be Schnuerle ported - check with the CD for clarification. Diesel, glow or spark ignition. Plain bearing engines only in 1/2A as per Midge and Phantom rules

Models

Models should be of a style prevalent in the 1940s, '50s or '60s and comply reasonably well with the technical specifications for Midge Speed, Phantom, Classic A or Classic B Team Race including engine size, line sizes, pull tests, wrist straps and general safety requirements. Variations such as profile fuselages, scaling up or down, own designs, undercarriage added or deleted and improved structure are all acceptable.



Open Category

If you wish to fly a model that doesn't adequately fit into the three main groups, you can enter in the Open category. We'll measure your lines, pull-test it as per the most suitable MFNZ CL class and time it over the nearest rounded 1 kilometer distance. You won't get a percentage score this time, but will have a benchmark of your own to pursue through the year.

Benchmarks

Flight speeds will be compared to the best category times of the previous 12 months to produce a percentage score. We'll start with the following benchmarks from flights observed at contests throughout the year: Open category flights will set personal best times as future benchmarks.

1/2A	13.65 sec per 6 laps	106.10 km/h
A	25.94 sec per 10 laps	138.78 km/h
B	25.70 sec per 9 laps	140.08 km/h

Scoresheet

I'll record entrant and model details along with flight times on a spreadsheet and make it available online and at Nats HQ each day. We'll announce final results at the CL prizegiving, January 6th at 4:30pm.



Coming Events

January 28/29	Waikato C/L champs Mercer Club BBQ (date to be advised)
February 4	Ngatea Vintage Meeting
February 11	Auckland F/F Gala Proctor Rd
March 4	Airsail vintage meeting
March 19	Rotorua 75 th yr Rally
April 8	Tuakau vintage meeting

Subs for the 2022/23 year

	CLUB	MFNZ	TOTAL
Senior	\$115	\$95	\$210
Junior	\$45	\$30	\$75
Associate	\$115		\$115
(Member of another club with current MFNZ membership)			
Social (non flying)	\$50	-	\$50

Payment can be made to ANZ account # 116102_0913131_11 Include your name in the details