



Aerobat



December/January 2013/14

Issue Number 5 Volume 4

Web site

www.hcrf.co.nz

Facebook

Hibiscus Coast Radio Fliers

Committee contacts

President

Wayne Drinkwater
president@hcrf.co.nz
(09) 426 8584

Secretary/Treasurer

Hayden Purdy
secretary@hcrf.co.nz
(09) 427 5906

Club Captain

Nigel Grace
clubcaptain@hcrf.co.nz
(09) 420 3182

Social Secretary

Ngaire Ladd
socialsecretary@hcrf.co.nz
(09) 4260840

Frequency Officer

Jim Hall
jimh.geo@clear.net.nz
(09) 426 1478

Editor

Ross McDonnell
editor@hcrf.co.nz
(09) 4260840

Cover Picture

From EAA news letter

Aerobat

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From the Editors Desk



I am trying my speech to type recognition software that comes with Microsoft, but it does seem to have problems.

For example If I say "Testing one two three four," I get "didn't want to bring more" or "by the and one can bring before," so I don't think it will save me much time.

If I talk long enough I should get an interesting book though. Think if "an infinite number of monkeys and an infinite number of typewriters could produce Shakespeare," (though, as a student going through high school, why they would want to didn't know,) then I stand a good

chance of writing a Pulitzer prize winner. We live in hope.

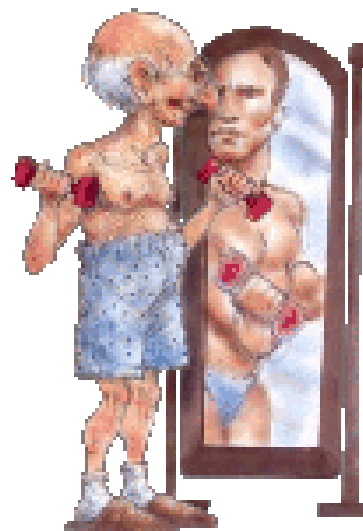
Great articles and photos for the last few issues. Thank you muchly.

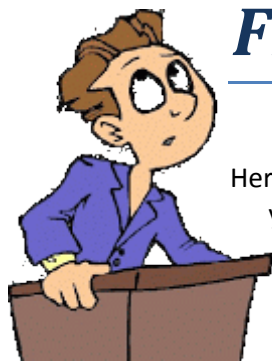
Please keep them coming in for the next edition. Photos and information of what's on your building board. Even suggestion for articles that could be of interest would be a help.

These can be Emailed to the editor at editor@hcrf.co.nz

Ross McDonnell

Editor
editor@hcrf.co.nz





From the presidential suite

Here we are again at the end of yet another year, and for me it has been a good year.

Just last weekend we had our Christmas luncheon and it was one of the best attended yet, and it all went very smoothly thanks once again to Ngaire's planning.

Again this year we had our indoor flying at the youth centre which has been well attended and we have always covered costs and made a modest profit, which will be put back into the clubs funds to provide prizes for our glider competitions later in the summer.

We have had one of our fabulous twilight fly ins with another only a week or so away, these are fantastic social events and even if you don't fly its well worth turning up for a natter and a bite to eat.

On the business side of things our Treasurer/Secretary Hayden Purdy informs me that our bank balance is well up on the same time as last year, this is due to the club raffle/ tea and biscuit funds, and also the indoor flying profits.

So you can see that the club is in a very good stance for the New Year.

All it leaves me to do is to wish you all a very Happy Christmas and hope 2014 is everything you hope it to be.

Wayne Drinkwater
President H.C.R.F.

MODEL AIRCRAFT PUBLIC FUN DAY

Proudly Sponsored by Hobby City

Sunday 23rd March

10am to 3pm

Wainui Pony Club Field

Wainui Road

Silverdale



Free Admission
Plenty of Parking
BBQ Sausage Sizzle
Hot & Cold Drinks
No Dogs Please



Contact
www.hcrf.co.nz
Wayne (09) 426 8584
Nigel (09) 420 3182

Photo Courtesy Roger Shearer

SERVO SETUP BASICS



Without smooth, non-binding control-surface movements, our planes would be nearly impossible to direct. Linkage systems, including the servo, servo arm, pushrod and control horn, are often overlooked, but they are the keys to smooth, strong, equal

control-surface deflections. Take the time to install the linkages properly and securely to guarantee control surfaces that work properly for the life of the plane. Let's look at these vital links and see where we can improve them, starting with the servo.

When the servo arm travel is not parallel to the pushrod, you have extra stress on and less control of the pushrod and servo arm. With everything set in line, you have less binding and maximize the servo movement.

First, make sure that the servo arm travels parallel to

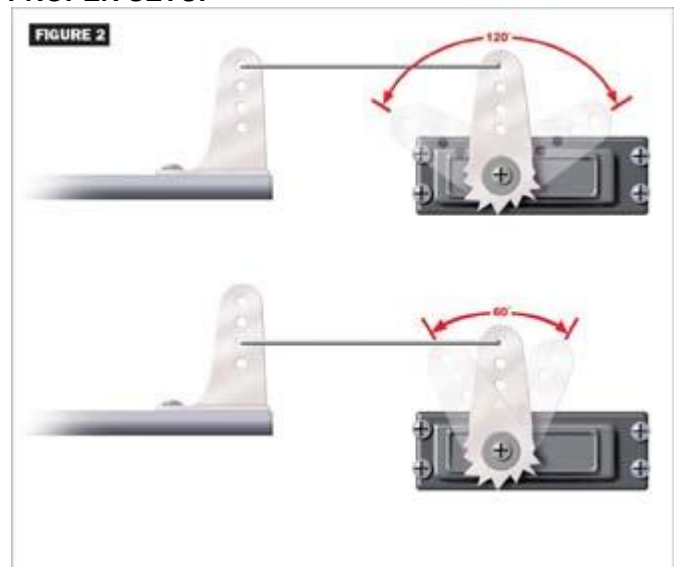


the movement of the pushrod so that it won't cause undue friction in the linkage (see Figure 1). Don't allow the servo arms to contact other servo arms or bind with the clevises at full rates. Now you can concentrate on maximizing servo power and control.

With programmable radios, we have the ability to control the amount of servo throw; this allows us to use all of the potential power and efficiency of the servo's full range of travel. When you use the full 120 or so degrees of motion from the servo arm, it exerts a more precise and powerful force on the control surface. For

example, if two control surfaces travel 35 degrees in each direction, and one setup has the servo arm moving 30 degrees in each direction while the other has the servo arm moving 60 degrees in each direction, the setup with 60 degrees of motion will spread the load out across the servo's full range of travel. This will provide maximum power and resolution to that control surface compared with the one with 30 degrees of servo-arm motion (see Figure 2). Every time we reduce (or restrict) servo throw, we give up bits of information that represent lost motion, and that can translate into less power and precision on the control surfaces.

PROPER SETUP



By having full travel to drive the control surface, you maximize the servo's precision and power. This setup works best with the pushrod in the outer servo-arm and control-horn holes.

If you use less servo throw, you have to connect the pushrod closer to the control surface on the control horn. The linkage setup will have less leverage to overcome the weight of the control surface and airflow as it moves over the control surface.

Ideally, at neutral stick, the pushrod geometry will look like this.

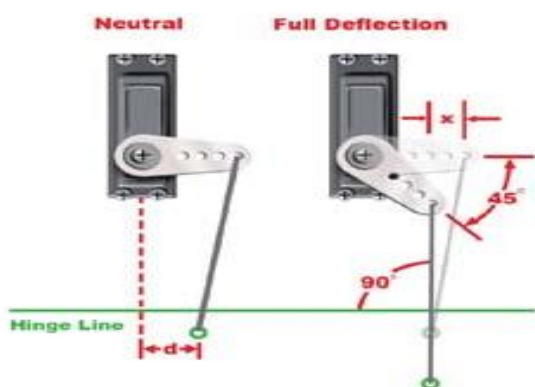


To maximize servo throw and resolution, we must take great care to set up our linkages properly. First, we must make sure that our servo output arms are carefully set so that they are perpendicular to the control rods and parallel to the hinge line. Do this by switching the servo arms around until the spline alignment is correct; try not to use the radio programming to achieve this. The numbers at the base of the arms on the multiple-horn servo arms represent the degrees from zero of alignment on the servo spline. By rotating the multiple-horn servo on the servo spline, you'll find that the servo-arm positions will be slightly different with respect to the control rod. These differences are just a matter of a few degrees and are specified by the numbers on the servo arms.

Using this mechanical process instead of the programming method allows you to arrive at the perpendicular angle to the pushrod and have equal movement on both sides of center. This way, the transmitter is left at zero with an equal amount of electronic signal in each direction of servo throw. Keep in mind that any programmed offset on either side of the servo's center affects the total travel when using all of the available servo travel. Ideally, at neutral stick, the pushrod geometry will look like that shown in Figure 3.

If you require more throw than your setup allows, use a longer servo arm to give you the throw you need. Avoid moving the pushrod closer to the surface on the control horn; moving it would reduce the leverage applied by the servo. At the other end, if you find that you need less throw, move the pushrod closer to the center of the servo arm. Avoid using the dual rates or endpoint adjustments for this whenever possible. Make large adjustments mechanically, and use the radio programming to make fine adjustments.

LINKAGE GEOMETRY



Most setups have the pushrod at 90 degrees when at neutral stick, but when it's pushed to full deflection, note that there is more of an angle and not the best linkage geometry when the most pressure is exerted on the control surface.

With this setup, the linkage geometry is angled when there is the least amount of pressure on the control surface. But when at full stick deflection, the linkage is straight and providing the best angle and power to the control surface.



The little number on the servo output arm corresponds to how many degrees the arm is offset to the servo spline. It is better to adjust the output wheel/arm manually so that the arm is perpendicular to the pushrod instead of programming the centering on the transmitter.

Now that we have maximized servo power and resolution, we can focus our attention on pushrod geometry. The connection between the servo arm and the control horn is vital to making sure that the flying control surfaces work smoothly. The linkage geometry should have direct travel between the servo arm and the surface control horn. Ideally, the linkage should have a direct straight line that is maintained throughout the travel arc of the servo and control horn. Servos that are installed so that their servo-arm travel arcs move in the same direction as the control horns' travel arcs already have this linkage geometry.

Problems with linkage geometry often arise when a servo is mounted so that the travel arc of the servo arm is moving perpendicularly to the travel arc of the surface control horn. This often happens when aileron servos are mounted in the bottom of the wing so that the top of the servo faces outward. This setup does make it easy to remove and install the servo and arm, but it can create linkage-geometry problems.

The linkage will typically be angled to the control horn and put extra pressure on the connection at the control horn. You can install ball links at both ends of the pushrod to relieve some of that pressure, but we still have to contend with the slight angle of the pushrod during movement. If the linkage is set up like most, i.e., so that the pushrod has a straight connection to the control horn when the servo is at neutral, this will be the only time when there is a straight direct link between the two. However, to improve our linkage geometry, we could move the control horn in so that it lines up closer to the servo body than it does to the end of the servo arm.

That way, there is a straight and direct link between the servo arm and control horn when it is at the end of the servo travel. This gives us two positions where the linkage is straight and direct (once at each end). Most of the pressure is exerted on the control surfaces when they are deflected at their extreme ends. It makes sense to have a straight and direct linkage at that time instead of when the control surfaces are at neutral.

FINAL ANALYSIS

There you have it! By setting up the mechanical advantage and the linkage geometry first, you'll end up with a plane that flies more efficiently. You'll feel more in tune with the plane because of the better transmitter-stick resolution, and the control surfaces on the plane will move more easily with more power and authority. And you will still have plenty of radio programming to fine-tune the plane's flight performance. As they say, "Try it; you'll like it."

DEMENTIA TEST

- 1) There once was a recluse who never left his home. One stormy night he had a nervous breakdown. He went up stairs and turned off all the lights and went to bed. That night he caused the deaths of hundreds of people. How?
- 2) Approximately how many birthdays does the average Japanese woman have?
- 3) If it took eight men ten hours to build a wall, how long would it take four men to build it?
- 4) From which animal do we get cat gut?
- 5) How can you lift an elephant with one hand?

For answers see page 8

I sometimes wonder
why
the model is getting
bigger

Then it hits me



-Interweb Thingee-

More sites that may be of interest

If you have a site that may be of interest for future Aerobats, please send the URL to the Editor.

www.ponoko.com

3D printing and laser cutting made easy. With Personal Factory, you can buy, sell & create custom products. Very easy to get started.

[http://www.wrightflyersrc.com/content.aspx?page_id=22&club_id=44589&module_id=40968#Aircraft Trimming Chart](http://www.wrightflyersrc.com/content.aspx?page_id=22&club_id=44589&module_id=40968#Aircraft%20Trimming%20Chart)

Wrightflyer give lots of information to the flier. If you don't know how to do it then this is the place to look for it

THE STORY OF A SUCCESSFUL MODEL BUSINESS BISHOP WRIGHT WAS WRONG.

Over a hundred years ago an American clergyman, Bishop Wright, told the audience at a small religious college that "Pretty much everything in nature that can be invented, has been. The world is on the verge of the millennium." A dissenter in the audience disagreed, asserting that the next 50 years would produce many exciting new discoveries.

When Bishop Wright challenged him to name but one, he suggested "Well, flight." The Bishop laughed, assuring him flight was reserved for angels. There was nothing unusual in this view in the 1880s, but Bishop Wright had two sons - Orville and Wilbur.

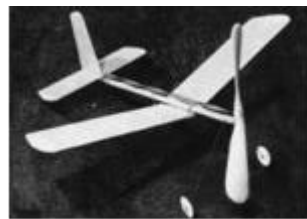
THE AIRSAIL STORY

Like the Wright brothers aircraft, **Airsail** was founded on the optimism of two young men, Len Perry and Wynn Craven. They had returned from war time service in the Royal New Zealand Air Force with considerable aeronautical engineering experience, which they decided to use in the manufacture, certification, servicing and repair of gliders for the post-war gliding boom sweeping the country.



Post-war import restrictions made it a difficult time to start any new business requiring components and materials from overseas. They acquired premises in a disused factory and then encountered difficulties in getting their Air Force aircraft engineering qualifications recognized by the civil aviation authorities.

To generate an income while waiting for the authorities to make a decision, they began producing simple Ready To Fly rubber powered model aeroplanes from scrap timber, powered by



rubber cut from automobile inner tubes. These models flew remarkably well, so well in fact that a New Zealand department store bought the entire stock, and suddenly **Airsail** was in the model aeroplane business!

Harsh post-war economic conditions forced a move to even cheaper premises in an old feed and storage building, where they produced kit sets, pre-cut wood, adhesive and dope. Production machinery was designed and built by Len Perry (pictured below) although most processes such as packing kit sets, filling bottles, labelling and corking were done by hand. Import restrictions spurred on Kiwi ingenuity, for everything had to be produced from

local materials, for example dope and balsa cement were produced by dissolving old 35 mm movie film in acetone! When balsa wood became available, **Airsail** designed a chuck glider, the Boomerang. A friendly printer allowed them to use his press to print the outline on at night, when the machinery was inactive. The success of the Boomerang encouraged them to produce other designs - the Delta Jet, the Skyline and a small pod and boom glider. Business picked up even further when diesel motors became available and the control line craze hit the country.



The demand for kits necessitated a move to larger premises, the present factory in Penrose, Auckland, where they produced the Satellite glider, one of the first kit models available in NZ with preformed components and die cut wood parts, produced with a band saw, a circular saw and lots of Kiwi ingenuity.

Recognizing a market trend, the **Airsail** team created a purpose designed range of models to satisfy control line fliers. First there was a trainer for the novice to learn to fly on, after which he or she could progress to the aerobatic model to improve their flying skills before graduating to a racer or a scale model.

Radio control eclipsed the control line craze and Len Perry bought one of the first American Heathkit R/C sets, assembling it himself then designing a powered model on which to teach himself to fly. Shades of the Wright brothers!

The introduction of locally manufactured Teletrol R/C sets in New Zealand created a demand for a radio control power model - the three channel **Airsail** Apollo 107. The success of this led to the introduction of something larger and more

sophisticated, the El Condor. Just as things were looking good, fate flexed her fickle finger twice to change everything dramatically. First, a heart attack laid Len low for several months. On his return to the fray, he found the model trade in a period of decline. Nobody was buying model kits any more. Airsail ceased further design and development to concentrate on their accessories business - control horns, bellcranks, pre-bent undercarriages, hinges, clevises etc. This belt tightening enabled the company to survive the lean years and to develop a comprehensive line of kits and accessories under the DECO trade brand.

Len Perry retired in 1984, selling **Airsail** and its factory premises to Goodmans. Unfortunately the new owners were businessmen, not modellers and lacked the aero-modelling knowledge to be able to anticipate the requirements of the modelling public. Business slowed and staff began to leave.



This seemed like the low point in **Airsail's** history... until three likely lads came by, looking for a business to buy: Brian Borland was already a top ranked modeller, having

representing his country two years previously at the World Scale Radio Control Championships in Reno, USA . This achievement had been accomplished after a long apprenticeship of competition successes at National level in control line combat, team racing, free flight scale and R/C scale. In addition to his aero-modelling experience, he had previously run his own airline model manufacturing business.

This background enabled him to see **Airsail's** potential. David Hope-Cross was an aviation historian as



well as an enthusiastic scale aero-modeller . Like Brian, he was a previous NZ scale champion and international class competitor, with an impressive list of scale models designs built and flown by him. Some of these models are now on permanent

display in museums around New Zealand. David too had a business background and believed Airsail could be brought back to being a successful manufacturing enterprise. Brian and David's optimism was shared by Bob Harvison, the third partner, who although not an aero-modeller, had produced decals for Brian's previous airline models business, and shared his optimism for resurrecting the ailing company.

At this juncture a small snag occurred when Goodman & Co decided to retain the brand name **Airsail**. This almost proved a stumbling block because the name Airsail was synonymous with quality kit production, and the new owners needed to use this name in future export drives. Eventually



a compromise was reached and Goodmans kept the name **Airsail**, and Brian and Co named their export manufacturing company **Airsail International Limited**.

After many years trading as Airsail International Limited the retail walk in shop was closed to concentrate on kit manufacture and wholesale supplies. At this point John and Sharon Danks saw the opportunity to purchase the retail business and the JR Propo agency so in 2010 the deal was done and trading commenced under the present name of JR Airsail.

John is well known in the hobby for his involvement initially in control line team racing and stunt. Through his attraction to speed he eventually moved to RC Pylon where he acquired New Zealand records in both racing and speed. He represented New Zealand at World Championship level where he gained valuable experience from the best in the world. He like many took a break to spend more time with their growing family and in later years has returned to the hobby. In more recent times he is flying IMAC and Pattern although the need for speed is still there and Pylon racing is still in his blood.

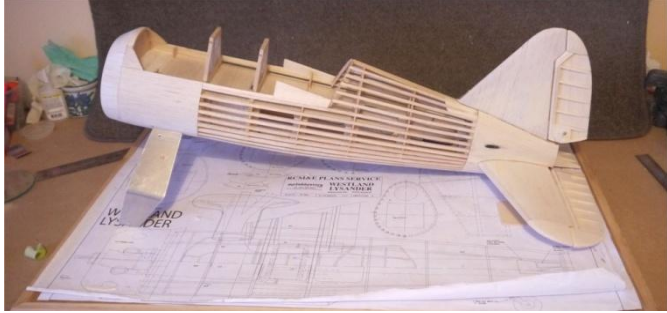
From the JR Airsail website

DEMENTIA TEST ANSWERS

- 1) He was a lighthouse keeper.
- 2) Just one. All the others are anniversaries.
- 3) No time at all it is already built.
- 4) Sheep and Horses.
- 5) It is not a problem, since you will never find an elephant with one hand.



AROUND THE CLUB



Pete Denison's Westland Lysander fuselage nearing completion. Plans came from RCM&E Plans Service. Span 1680 and will be electric with a Hyperion HP -ZS3025-10 with a 12*6 prop.



Wayne Drinkwater's new pulse jet. Not new any more as it has had its first run



Ross Purdy's Windrifiers, the one on the left built in 1976 and the one on the right built in 2013.



Henny Remks' latest project, a Nieuport XI, still a work in progress! It has been quite a mission to get this far, because it is a copy of the original.



Bryan Leeves's photos of the DHC Caribou at the QLD museum. With the interest in this plane in the club it was quite an opportunity to climb all over it,



Nigel Grace's bird of time stopped flying at 600ft when half the wing fell off.



Scott Purdy's scale kyosho hein 50 raffle prize from Green Rd scale day. Well done that lad!

BUILDING A “WOODY”

by Ross Purdy

My first Windrifter was built from a kit that my father bought back from a trip to Sydney in 1976.



Back in those days everybody in the club (Roskill Modellers) were building and flying Aquila thermal soarers which were built like a battleship. When I turned up with my new, very lightly constructed Windrifter the expert's said it wouldn't survive the first bungy launch. Well they were all wrong and not only did it survive it beat the Aquila hands down in all respects and it is still going strong 37 years later.

One of the club members hounded me to buy it and in a weak moment I sold it to him. The model that most of you have seen me fly at Wainui was scratch built from the original plans also in 1976.

At some point in time somebody borrowed the plans, as they do, and never returned them so I was unable to build another one.

Craftair disappeared years ago so I thought that was the last I'd ever see of the model but to my surprise Hayden found that you could still get a partial kit for this model from Skybench in the USA (www.skybench.com). For USD78.99 you got the fuselage sides, top, bottom, formers, laser cut wing ribs, original plans, and building instructions.

To start the construction I needed to turn the partial kit into a full kit by assembling the necessary

strip wood. Sadly I couldn't purchase all the correct sizes so I had to band saw up some sheet balsa and various strips to the required size. Once I got cracking on the building it didn't take very long to produce the airframe and fit out the electronics.

One of the problems with the original model was the lack of spoilers which made it difficult to spot land especially as it has a tendency to float on and on. To remedy this I have fitted my own design spoilers which took all most as long to perfect as it did to make the airframe !. To finish the model I used a paint finish on the fuselage and transparent orange Solarfilm on the wings and tailplane.

All up it has taken me about 4 non flying weekends to complete.

Some stats of the model:

Wingspan 100",

Main servos are Savox SH-0256,

Spoilers and releasable tow hook are cheap 5 gram servos,

Battery is Sanyo eneloop 2000mAh 4 cell.

Finished flying weight is 38.8oz (1.1kg) giving it a wing loading of about 5.9oz/ft².



To document the build we have done a time lapsed video which we will put up on youtube soon to help other possible 'Woody' builders !.

H.C.R.F. Calendar 2013 – 2014

Date	Day	Event	Where/When
1 December 2013	Sun	Ponyclub Mini ODE	Wainui All Day
2 December 2013	Mon	Club Night	Whangaparaoa Guide Hall 7-30 Pm
4 December 2013	Wed	Twilight 2	Wainui 5-00 Pm
11 December 2013	Wed	Twilight 2 Rain Date	Wainui 5-00 Pm
29 January 2014	Wed	Cross Country Practice	Wainui Pony Club All Day
3 February 2014	Mon	Club Night	Whangaparaoa Guide Hall 7-30 Pm
5 February 2014	Wed	Twilight 3	Wainui 5-00 Pm
12 February 2014	Wed	Twilight 3 Rain Date	Wainui 5-00 Pm
16 February 2014	Sun	Wainui intro Open Day	Wainui Pony Club All Day
3 March 2014	Mon	Club Night	Whangaparaoa Guide Hall 7-30 Pm
23 March 2014	Sun	Open day	Wainui 8-00 am

Merry Christmas to you & yours.

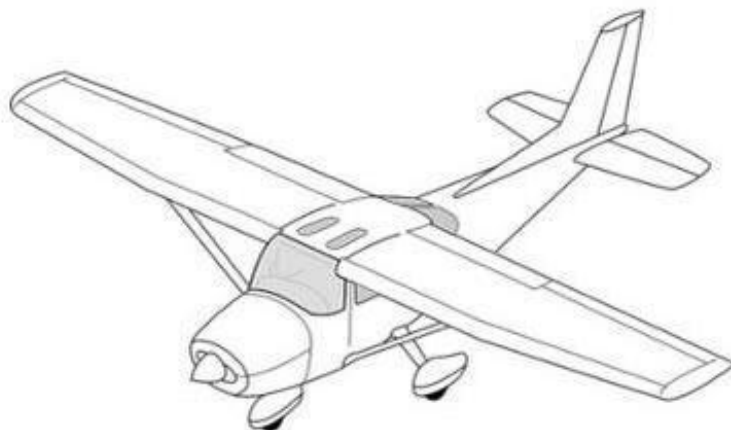
A special thanks to everyone who donated their spare cutlery and crockery for us all to use at our Twilights. It will be much more pleasant to use than that plastic YUK.

Hope you all enjoyed your Christmas Lunch and have a great one on the 25th.

Regards Ngaire the Weather Witch
Social Secretary



WELCOME TO AVIATION!



YOU ARE NOW BROKE.