

# ROTORUA MODEL AIRCRAFT CLUB (INC)

## July 2020 NEWSLETTER

Secretary Andy Watson

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|                                         |              |              |              |
|-----------------------------------------|--------------|--------------|--------------|
| <b>Sub for the 2020 - 2021 year are</b> | <b>RMAC</b>  | <b>MFNZ</b>  | <b>TOTAL</b> |
| <b>Family</b>                           | <b>\$120</b> | <b>\$100</b> | <b>\$220</b> |
| <b>Senior</b>                           | <b>\$115</b> | <b>\$95</b>  | <b>\$210</b> |
| <b>Junior</b>                           | <b>\$45</b>  | <b>\$30</b>  | <b>\$75</b>  |
| <b>Associate</b>                        | <b>\$50</b>  | <b>-</b>     | <b>\$50</b>  |

**Payment can be made to ANZ account # 116102\_ 0913131\_ 11**  
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Welcome to the July 2020 newsletter. With the recent weather there is little flying activity to report. Dave has some interesting information on landing gear and Brian has provided another excellent profile and a photographic record of recent activity.

Flying conditions have not been the best recently with plenty of rain and wind but a hardy few have persisted against the elements. Sunday was another cold overcast day but reasonably calm. Dave found some strong lift with his glider which was a surprise given the conditions.

On the new model front. Neal has a VQ models Beech Bonanza ready to go and we hear there are a few others awaiting some fine weather for test flights.

Andy Ws Spitfire is rapidly taking shape and has a recently acquired Moki 30cc in the nose.

NDC events this month include R/C Vintage Precision and we have three members keen to put in sometimes.

Keep Saturday 29 August free for another Club get together at the Lone Star Restaurant. Details will be confirmed next month.

### Practical Undercarriages.

Readers who studied Brian's photo sequence of my superb Mustang landing in the last bulletin may have noticed the state of the undercarriage during the actual moment of impact (unfortunately that is the only correct word to describe the touch down!) Here is the pic again and just look at the angle of the U/C legs as they deflect under the shock load!



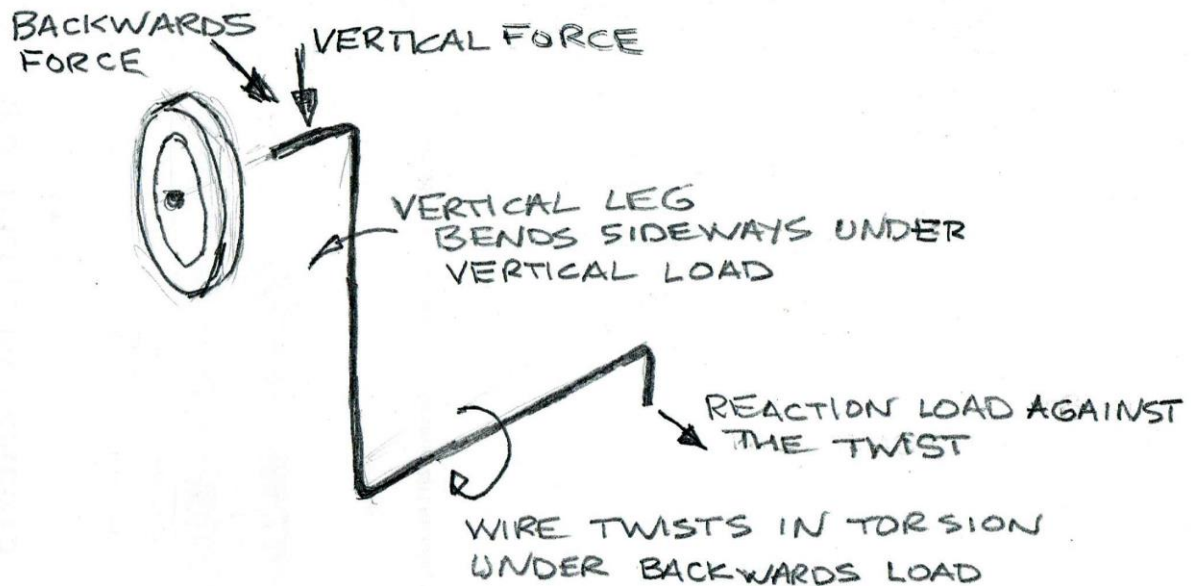
The next pic, a fraction later, shows that they have recovered to the usual condition that a heavy landing leaves them i.e. deformed backwards by about 30mm from the take-off position. The task is then to remove them from the wing and bend them back in the vice before refitting them.

(BTW, I don't know how the prop survived the impact)



The U/C set up in this model is wing mounted and the design absorbs shock by the wire bending both in torsion and beam bending. Backwards forces on the U/C are absorbed by the horizontal section running along the wing surface under the plastic clips with the wire twisting under torsion. Vertical forces are absorbed by the almost vertical splayed out leg bending sideways. Under most landing loads the backwards force is much greater than the vertical load. The wire torsional force has to be opposed at the end of the U/C and this is achieved by another vertical leg that is located into a hard-wooden block built into the wing to provide a moment reaction force.





### U/C LEG WITH WING DOWSIDE UP

Straightening the U/C, involves removing it (NEVER try to do it in situ) and then LIGHTLY clamping the horizontal section in a vice with the reaction leg vertically downwards. The wheel is then forced forwards (or backwards) into its correct original position. Because the horizontal part is lightly clamped the wire again bends in torsion and back to the original position. When you do this, you will appreciate the enormous loads that the wing must have experienced when it was being abused by the landing shown in the first picture. My Mustang must have a well-designed and bonded structure in the wing.

This type of wire U/C is also used in fuselage mounted arrangements with the horizontal torsion, part running across the fuse bottom and the short vertical reaction leg located in a wooden block mounted inside the fuselage sides. The vertical leg in this case is not vertical but splays outwards at about 45deg so that there is a wide base to the U/C. Because the vertical load is now only carried by a slanting piece of wire its often the case where this part of the U/C has to be straightened after a heavy landing.

This torsion type of U/C is the very best type of U/C in my view. It's simple, strong, easily straightened, light in weight and easily made. That great piece of British engineering, the Morrie Minor, used torsion bar springing along with many other cars. Incidentally, a coil spring is actually a long torsion spring that is formed into a helix. As the spring compresses (or extends) the steel is twisted in torsion by the continuous form of the helix. (The engineering equations to calculate deflections are based on those of a torsion bar)

The worst type of model U/C, and unfortunately the sort now most often supplied with ARF's is the formed aluminium strip type with a horizontal part screwed to a

mounting plate on the bottom of the fuselage and the legs extending down and out to carry the wheels. This type needs to be made of tempered aluminium (difficult to obtain) in order to have adequate stiffness so you can't make one at home and then you need separate wheel axles that are bolted to the ends of the legs. It has absolutely no shock absorption to backwards loading and usually the mounting in the fuselage is a narrow piece of plywood bonded into the bottom. The first real knock the U/C experiences and the mounting plate is ripped from the fuselage along with some of the structure. The only good thing about this type of U/C is that the fuselage legs have about half the drag of the wire type.

Just as the last newsletter was published, I was involved in repairing two models that had strip type fuselages that had been ripped from the fuselage bottoms. There is no point in repairing the fuselage as original because it will only happen again, and to make a strong enough structure to carry the loads would be far too heavy. In the past I have tried rubber mounting strip type U/C's but never with much success. This time I took a leaf out of the traditionalists who used to rubber band mount their U/C's.

On the trainer model I made a plywood plate that was three times the width of the U/C base and bolted the U/C base to the plywood. With the U/C now held in position, holes were marked in the fuselage for cross dowels front and behind of the plate. In way of the dowels, some thin ply reinforcement was bonded to the fuselage insides, and when everything was complete, strong rubber bands were passed around the dowels and over the mounting plate. We now have a practical U/C which can absorb backwards loads by the rubber band stretching.

On the second model the same principle was used but because the U/C fitted into a deep slot in the fuselage I was able to bend the flat (originally horizontal) part outwards in a vee shape thus providing a shock reaction feature, so a longer plate was not required and rubber bands over the aluminium were adequate.

If you want to see the ultimate in shock absorbing U/C look at David Little's trainer model which also has an angled forwards U/C thus providing a vertical AND backwards shock absorbing capability.

If you ever get an ARF with a bolted-on strip type of U/C it would be a good idea to alter it before you even maiden it.

BTW, to reduce the drag on a wire U/C I form teardrop fairings from beer can material and wrap them around the wire. This prevents the drag eddy forming behind the wire and halves the drag. They flap around loose but blow in line with the strip stream.

### Model Flying World

If you are wondering where the last issue of Model Flying World is, it might be residing in your one of your email folders. Due to the CV lockdowns it was not printed and mailed out as usual. It was actually a good edition with lots of interesting content. Download it and read it at your leisure. MFNZ council have debated the economics of electronic versus hardcopy production many times in the past. As a stick in the mud dinosaur, hope they stick with hardcopy whilst I am around.

## Our Old Mower

This was advertised on Trade Me and sold during the month. Unfortunately, as yet the buyer has not paid for it or arranged collection. I hope he is not going to let us down.

## **Coming events**

### **CLUB FUEL**

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