Balancing Giant Scale Airplanes

By Wayne Geffon

This method is how I go about checking CG on a plane that weighs too much to put on a CG machine. This is generally the same way full scale planes are balanced. You can't go lifting a 747 by your fingers!

First, have the plane assembled as **RTF**, but minus fuel. Find a place where you can put the nose of the plane up against a wall. Take a level and prop up the tail wheel until the fuselage is sitting level. You will probably have to take the hatch off in most cases to find a suitable area to set the level on.

Once the plane is sitting level, place masking tape under the area where the main wheels are touching the surface and draw a line where the wheels contact the tape. Make an index mark where the center of the tail wheel falls in the same manner. This mark will be on whatever you propped the tail up with. (I use magazines). It's also a good time to measure from the wall, to the point where the recommended CG is. Save that number for later.

What you are looking for at this point is the distance to each wheel from the tip of the spinner. (which should be touching the wall at this point) I use a long straightedge to get the distances

As an example, let's say you come up with theses numbers:

- LH main – 22"
- RH main – 22"
- Tail wheel – 70"

Now, place a scale under each wheel individually. You will have to re-adjust the height of the other wheels each time to keep the plane sitting level. Add more magazines as necessary. (If you have three scales you can get the weights at the same time but make sure the plane is level)

Don't forget to re-install the hatch before you weigh each wheel. You will wind up with three weights, one for each wheel.

Let's say you come up with these numbers

- LH main – 9 lbs
- RH main – 9 lbs
- Tail wheel – 5 lbs

Now its just a simple math problem to find where the CG sits right now on the plane - Weight x ARM (distance) = Moment

So...

- 22 x 9 = 198 in-lbs
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- 70 x 5 = 350 in-lbs

Now add the total of all the moments and the total of all the weights.

Weights 9 + 9 + 5 = 23lbs and moments 198 + 198 + 350 = 746

Then divide the total moments by the total weights.   746 divided by 23 = 32.43

That number 32.43 is "in inches" how far back from the tip of the spinner to where the plane balances right now.

Compare that to the distance that you measured earlier to the recommended CG location.

If you are off one way or another adjust items then recalculate the weights. The distances (or ARM's) aren't going to change so you already have those numbers.