

Newsletter of the Pikes Peak Radio Control Club

AMA Club Number 179

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Next Club Meeting:
Tuesday, May 1st, 2007
7:00 PM at the ELIC
(East Library Info Center)
Pikes Peak Public Library
(on Union)

The Warbird Corner

By Keith Davis

Well if you never have heard of the Russian aircraft company Mikoyan-Gurevich, or better known as "MIG" then you are way behind the times. So let me update you! They have been in the combat fighter business since WWII. They are also considered one of the best jet fighter manufacturers in the world today. So here is a quick rundown of some unknown facts of the more famous MIG fighters that you may have heard about:

NATO has given all Russian fighters a code name beginning with the letter "F".

MIG-15 Fagot: (1949) Russia's first operational combat jet. It would never have gotten off the ground until Britain unknowingly sold Russia a Rolls Royce jet engine. The MIG-15 did not have "Hydraulic Assist" flight controls.

MIG-17 Fresco: (1952) First Russian fighter to be equipped with radar, afterburners and air-to-air missiles. The MIG-17 was a vast improvement over the MIG-15, but still had no "Hydraulic Assist" flight controls, which is not good in high speed maneuvers.

MIG-19 Farmer: (1953) Russia's first jet fighter to maintain mach 1 in level flight. It had two jet engines. Early MIG-19s tended to explode during flight because the main fuel tank was placed between the two engines where it quickly overheated.

MIG-21 Fishbed: (1959) Many versions of the MIG-21 were restricted to 45 minutes of flight time. This

was because after using half of its fuel, the CG shifted so far critically aft, that the aircraft became almost impossible to control.

MIG-23 Flogger: (1970) Russia's first fully adjustable (manually) swept wing fighter. It was also the first to carry "Beyond Visual Range" (BVR) missiles and limited "Look Down – Shoot Down" radar. Russia's first fighter to obtain mach 2 in level flight.

MIG-25 Foxbat: (1970) Russia's first fighter to obtain mach 3+ airspeeds. Pilots were restricted to mach 2.8 airspeeds because anything over that, the engines were totally trashed and had to be replaced before its next flight. Had only a 186 mile combat radius.

MIG-27 Floggger D/J: (1973) The ground attack version of the MIG-23. Equipped with a six-barrel 23mm cannon, later upgraded to a six-barrel 30mm cannon. It also had heavier than usual armor plating around the cockpit.

MIG-29 Fulcrum: (1983) First Russian fighter to incorporate the Helmet Mounted Sight System (HMSS). The Russians normally do not give their aircraft official names, but they loved the name "Fulcrum" so much, they officially name it so.

MIG-31 Foxhound: (1982) Replacement for the MIG-25, Russia's first two seat jet fighter, pilot and WSO. The chief Phazotron Radar designer of the MIG-31, Adolf Tolkachev, sold its secrets to the west, and was later discovered and executed.

MIG-33 Super Fulcrum: (1996) Vast improvement over the MIG-29 to include being several inches larger, improved weapon systems, thrust vectoring and a quad triple- redundant fly-by-wire flight control system

MIG-35 Fulcrum F: (1999) Not only does it have the thrust vectoring and fly-by-wire technology, it no longer requires Ground Control Intercept (GCI) guidance. Its radar can track 30 targets simultaneously at 130 km away. India plans to buy this aircraft.

Well that's a short history of the MIG jet family. And they continue to build and improve. But hopefully, it's nothing that our brand new F/A-22 Raptor can't handle!



From the March Meeting

By Bill Sanderman

Twenty nine members were in attendance when President **Randy Oswald** opened the April meeting at the East Library on Thursday, April 5th. There were no new members or guests present.



Keith Davis' P51

Secretary, **Bill Sanderman**, reported that preliminary March income was \$ 1,230.00 and expenses totaled \$54.56. Total club assets in checking and savings accounts total \$12,929.21 and the \$30,000.00 CD brings the grand total to \$ 42,929.21. The statement is preliminary because the bank statements had not yet been received for March when the report was prepared.

Safety Officer **Nick Radle** has moved to Tucson and is being replaced by Keith Davis.



Wayne Cooksey's Moodey Mite

The Father's Day Fly-In will be held on Sunday, June 17th.

Adam Heffington reported that a member suffered a face cut from a thrown prop. There is a first aid kit at the field.

Field maintenance activities will begin next month.



Mike Evans' Fokker D-8

Three model aircraft were presented for show and tell: **Keith Davis** brought a P-51. **Wayne Cooksey** showed a "Moodey Mite" built from old plans from the **Ray Orr** collection which Wayne acquired when Ray moved out of state last year. **Mike Evans** had a Fokker D-8 on display.

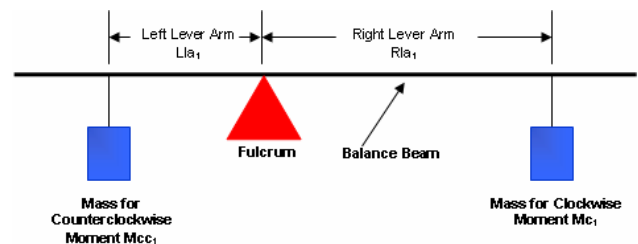
Adjournment: The meeting was adjourned about 7:45 PM.

Got a Moment?

By Mike Weidner

So, does anybody remember studying Physics way back when? You know, that science that deals with matter, energy and their interactions. I remember a couple of lab sessions where we had to evaluate what the professor described as *Equilibrium of Non-Concurrent Forces*. Huh? This professor-speak for *The Law of Moments* – and the basis for this article.

Here is a depiction of The Law of Moments:



The equilibrium implied by the level balance beam above is expressed as ...

$$(Mcc1)x(Lla1) = (Mc1)x(Rla1)$$

The Law of Moments allows us to determine when or where an object is balanced. The *where* part of the *when* is important to folks that fly airplanes because those who fly them need to know if their aircraft will behave themselves when flying. If they are not properly balanced, well then, you get the picture. This notion even trickles down to us in the model aviation world.

I recall three admonishments from Ivan that remain with me to this day. Not surprisingly, all three relate in one form or another to an airplane's center of gravity (CG):

1. Never trust the model designer's choice for CG location - always accomplish an added sanity check by double-checking the recommended CG location against a notional point registered at 25% of the model's Mean Aerodynamic Chord.
2. Accurately determine where the model's actual CG is relative to where it is supposed to be.
3. Finally, a nose heavy model might be cumbersome to fly but a tail-heavy model will certainly die ... (*lest the earth come up and smite thee*).

Most seem content to blow through item 1, resting their fingers at a point on the wing where they hope to find the CG is and make adjustments accordingly.

The downside of this simplified approach is that some models make this approach a little tough. The 20 plus pound giant scale model can be difficult to balance using the fingertip method. Then there is the challenge of finding the CG or balancing a biplane, delta wing, or a swept-wing jet.

Folks in full-scale aviation grapple with this weight and balance problem routinely, using a set of appropriate scales and some accurate distance measurements. It does not matter if the airframe in question is a high-time rag bagger just recovered and out of the paint booth or a full freighter retrofit to an old DC-10. In both these instances, it is important to know not only the total weight but also the distribution of that weight to determine the aircraft's CG.

Recently there was an article in *Contraails* (the newsletter of the Jet Pilots Organization, an AMA special interest group) written by Steven Ellzey. The focus on Steven's article was "balancing the big one (or a big F-100 *Super Sabre* in this case)." Steven's narrative discussed all the moments shown in the

figure at the beginning of this article and how you grind out the numbers to find the CG. The shortfall was that the narrative did not provide an easily accomplished number crunching sequence. In other words, a plug-and-chug approach would have been helpful.

What was missing from Steven's informative read became the shove that got me going on this article. I'm OK punching the buttons on my TV's remote but repeat sequences being beat into a calculator are a bit boring. And what happens if you mess up? You have to start all over.

I wanted an easy, accurate, and easily repeatable approach. An old issue of *RC Modeler Magazine* proved helpful as well. Those with back issues might want to look at page 96 ("Center of Gravity Location") in the June 1992 issue. Being armed and dangerous with refreshed memory, the only items I needed to mount a frontal attack on the CG problem became Microsoft's Excel, a digital shipping scale, and a steel rule.

I cobbled up two Excel spreadsheets – one tailored for traditional tricycle geared airplanes, the other for tail draggers. Each offers US or Metric solutions. After setting up the airplane and the scale, I can easily determine exactly where the CG is. No more hanging the model from the ceiling or an overhead and hassling with plumb bobs; no hassles of trying to "balance" the plane using your fingertips or finding someone to hoist up the opposite wing tip.

An added feature of the spreadsheet is that if I already know where I want the CG to be, the spreadsheet will inform me if more or less weight is needed on one end of the airplane or the other – and exactly how much! In addition, because the main wheels are being weighed, it is easy to get an idea how well the airframe is laterally balanced.

Is this too good to be true? Nope. At the May club meeting I will demonstrate it but volunteers are needed. If some of you could bring any of your larger models to the meeting, we will set them up and I will show you how easy it is. All I ask is that if you are bringing a tail dragger; bring something along that will raise the tailwheel to ensure the fuselage is parallel with the ground reference when we measure the wheel weight(s).

Here's a walk through of the setup, it's easy: Place the model on a table and, if you have one scale, sequentially obtain the weight on each wheel. Note from the photos below I have made a couple of blocks with "wheel chocks" Velcro'd to them. This keeps the model at the same height as the scale

and helps to keep the model from rolling off when you are jockeying the scale from one wheel to the next. After the wheel weights are all noted, the only additional piece of information needed is the distance between the wheel tracks – that is, the distance from the nose wheel to the track of the main wheels. This dimension is important as it establishes the base of the moments discussed earlier.



For Sale

By Paul Hassler

Paul Hassler has 2 giant scale planes for sale. They are both:

- 90" Staudacher GS-300
- Sheeted wings, Framed Fuselages
- 1 Includes 4 1/2" Spinner and tail wheel \$350
- The other still in shipping boxes \$300
- Also NEW servos and various hardware and supplies.

For questions or interested parties, call:

PAUL HASSLER
596-2203



July 7 & 8

Registration
08:00

Landing Fee \$25.00

Includes Event Shirt and Lunch

Check
www.pprcflyers.net
for map to field