JET CATAPULT GLIDERS

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Here's the "complete skinny" by a *renowned modeler* on *getting your cat jets* to *fly well. You can take what Vic says about this perplexing event in our hobby right* to *the bank - Editor.*

The Jet Catapult event has a lot going for it, they can be built in a hurry, you can put a bunch in a small box, there's lots of great color schemes, and they go up fast. In reality, however, they can come down as fast as they go up, and a shower of colorful confetti is sure to follow. Let's see what we can do to get some longer flights out of these puppies.

First, as the late, great Sal Taibi" used to say, "It's time to use the good wood!" Yep, that's right; use your light, contest grade balsa. **Most of the jet cats I see are built way too heavy. And small!** That's what I said: bigger models that are light, fly and glide better. Why do so many of us expect a model the size of a hummingbird and the weight of a turkey to glide well? Sure they go up like a rocket, which appeals to the little kid inside all of us, but even if we can get it to glide, it will have the glide of a space shuttle. All my past experiences with non-scale catapult gliders in AMA events dictated **a catapult glider should be between 16 and 18 inches** to get a good glide. I strive to **keep them below 1 ounce in weight**, approximately 30 grams. My winning catapult glider at the Chicopee, MA Nats, the first time catapult glider was offered officially, was a "Zip A Do Too", weighed in at sixteen grams with a sixteen inch wing span. I should have named it "Sweet Sixteen."

In order to keep the weight down I've resorted to not only using contest grade balsa, but I weigh a wing after all the shaping, planning and sanding takes place and then stick it on a scale before I go any farther. **If it weighs over 10 to 11 grams**, it's time to get out a pencil, ruler and razor blade and make **the wing into a "built up" like structure.** I cut the panels into wide leading and trailing edges and cut out some ribs to hold them apart. Keep the same thickness you were aiming for, max chord height of *1/4"* or less. **A good compromise is *3/16"* for achieving good altitude and glide.** By the time you finish sanding you'll probably have the tips tapered in thickness down to 3/32" or so. Cover the wing with Japanese tissue to further keep the weight down.

The fuselage is handled in a similar way, **by planing and sanding from the back of the wing to the tail feathers.** This saves your clay supply by minimizing the glob you'll have to put up front to balance the model. I also use plywood cheeks over a ballast hole in the front end. That helps hide the messy clay or lead in the nose and also reinforces the place where you install the catapult hook. **Hooks mounted under the wing make loopy launches**.

I usually finish my models with a coat of sanding sealer, sanding well, and then a coat of *50/50* Lite Coat, with two coats of dope on the Japanese tissue. Then, the colors are sprayed on using the floral sprays you can get in Michaels' or other box store creative supply places.

I better step back a bit here and talk about what should fly well and what won't. A full-size jet aircraft has a long nose where all the avionics, radar and ammunition and ... well, you get the picture. If the engine was in the nose like a piston powered plane the nose would be shorter. Long. high profile noses with swept back wings and short tail moments just love to spin after stalling. and they rarely recover. Although I do have a jet catapult glider Mig-15 that will stall and spin and then recover. I had to put on its wing air flow fences before it would do this.

Since we're launching these things at the speed of a baseball thrown by a high school pitcher, and they have to glide at the speed of a bird for the remainder of the flight, there are going to be lots of compromises in our design. Use only enough incidence difference between the wing and the stab to get some recovery from launch to glide without nosing it over into a dive. **I set mine between *1/64th* and *1/32"d* of an inch**, no more or you get a very loopy launch and have to put a lot of weight on the nose to balance the model for glide. **Swept wings don't slow down in the glide the way straight wings do. but they seem to launch a bit higher**. Take your choice as to what part of the flight profile you get excited about when you're looking for a design. I've been having fun with both!

As to full size aircraft to model, well, you take your choice. Try **to find airplanes with fairly short noses and long tail moments**. Wings that are severely swept back won't glide very well. **Wings that are at or above the mid line of the aircraft will do well**. My stable of jet catapults right now consists of an F-86D, a Grumman Intruder, a Bell Airacomet, and an English Electric Canberra. Yes, there have been others, but they weren't very consistent. As for what you choose to build, well that's for you to decide. We've all seen FAC'ers fly models that everyone agreed were impossible, but keep in mind the problems with short tail moments and long nose moments when you're drooling over those 3-views.

You can't fly FAC jet catapult gliders like an AMA catapult glider. The high climbing, flat gliding endurance gliders are set at zero/zero incidence between the wing and the stabilizer; with the CG (or balance point) back considerably more than you can get away with on a profile model of a jet set up with a normal tail moment for a full-size airplane. So we must come up with a bit more of a compromise here. Build in that small amount of incidence so that your model will recover and glide, but not so much that the ship becomes loopy on the launch. Launch the glider to the right, with the right wing tip held low and the nose up at about 30 to 45 degrees. This should give a right turning climb. If you've set the glide to the left, the model will flatten out when it runs out of launch inertia and then settle into as left glide. **Of course. the proper thing to point out here is that you reverse the directions if you're left handed.**

You have to work on this quite a bit because the launch trim and the glide trim interact through out the flight. **Trimming a catapult glider takes a lot of effort**. To get a catapult glider in good trim you have to work in small changes of rudder turn, incidence changes, and even launch angle. Even a slight bit of warp change to the trailing edge on one side of the stabilizer will have a significant effect on the model's climb and glide. By the way, it's also advantageous to add a bit more stabilizer area to your model, since the real aircraft usually didn't need built-in

stability. In fact, pilots get mad at an airplane that just wants to fly straight. We, on the other hand, have to cope with some serious free flight speed changes and turbulence by building the stability into our
models.