

## **BVM King Cat – Building Review**

by Craig Gottschang

May 17, 2004

I just finished assembling/building my King Cat and thought that those of you who are getting ready to start your own or who are considering a King Cat might benefit from my experience. This is in no way intended to be a comprehensive description or review of the King Cat as there are many of these models flying now and there have been any number of reviews and reports in other publications. This will simply be some of my personal observations, comments and suggestions as a recent builder.

The King Cat is typical of most BVM kits in that it is well designed, well packaged and comes with a somewhat more detailed (42 page), assembly and operations manual.

**Photos 1 and 2** show the major components and hardware packets as they come out of the two large shipping boxes.



**Photo 1**

Airframe components as they come out of the box. Lightweight, strong and undamaged.



**Photo 2**

Neatly packaged hardware “groups” for the various King Cat sub-assemblies.



**Photo 3**

Foam/foil cushion bags use Velcro to close up.  
These come with the kit at no extra charge.

All of the major components (wings, fuselage, booms and stab), come with reusable cushioning bags (**photo 3**). I found the kit to be unusually complete with normally the exact number of screws, angle brackets, quick links etc., required for a particular task. Keeping track of these parts with their original bag “group” is helpful to avoid misusing them or coming up short later.

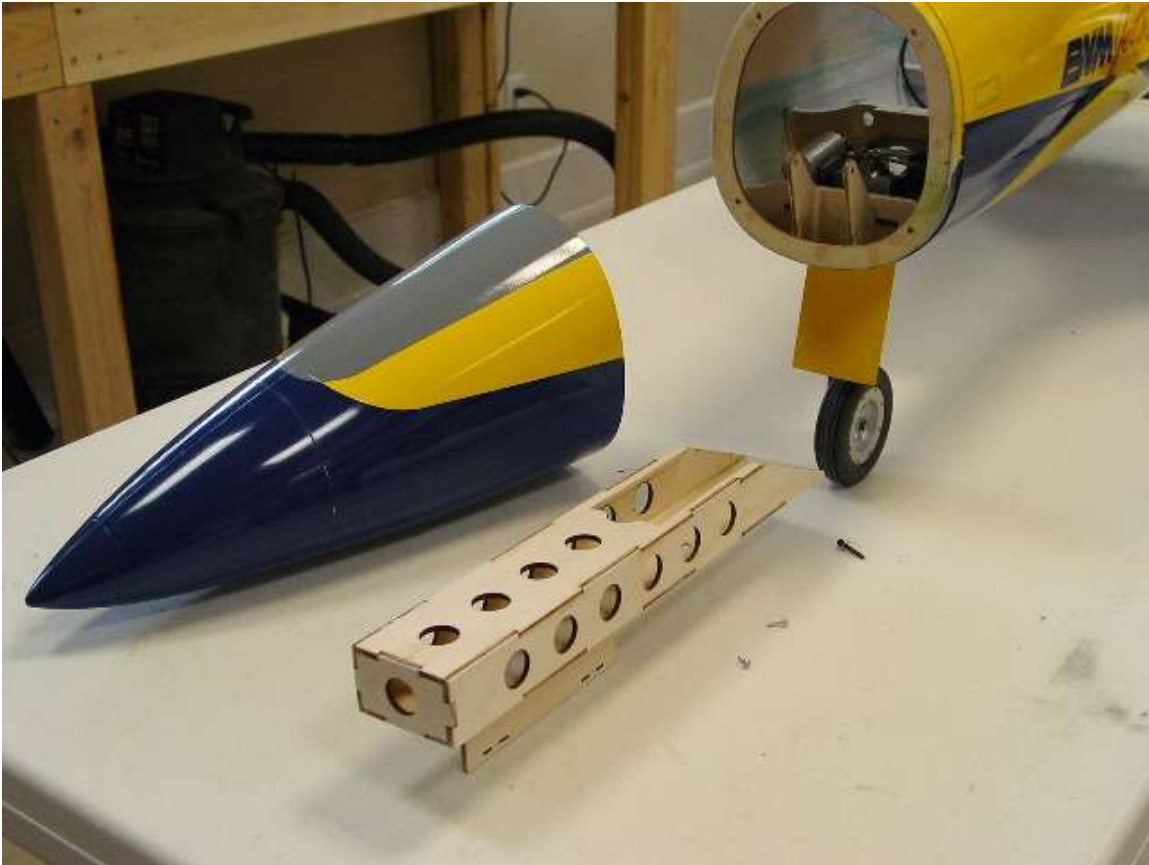
The kit is billed as an “ARF” and certainly is by jet standards, however if you think you are not going to have to cut out gear doors, fit canopy hooks and assemble Kevlar fuel tanks you would be mistaken! Nevertheless, the actual “construction” of the kit is minimal and the majority of time is spent fitting and installing the 8 control surface servos, each with it’s own “pocket” complete with maple blocks, brackets, linkage and cover. These take time as you need to be accurate and periodically have to wait for glue cure. However, all the control surfaces are pre-attached or “flex hinged” as BVM calls them and what a pleasure it is not to have to fool with this tedious step! The “finish” on the pre-painted versions of the King Cat are nice but do not expect full build/finish quality. The seams are prominent and some of the paint lines are not too crisp. The appearance is enhanced by some “stick on” decals (included) and BVM provides templates for extra paint detail in front of the canopy and engine inlet areas. I also added some Pro-Mark generic hatches/markings and a few miscellaneous extra stick-on’s. The result is a very sharp looking, bright and visible sport airplane. If you are looking for a show quality, award winning, time consuming finish then I would suggest the all-white version which you can smooth out, trick out and buff out to your heart’s content.

I have heard of people completing King Cats in 2 weeks or even less but the average modeler will probably need a month, working evenings and some weekend days. You can plan on using at least 2 to 3 tubes of Aeropoxy and a 2oz bottle of Slow Zap. You will also need to order 24 servo extensions of varying lengths (totaling 33 feet!) as well as 2 “Y” harnesses, 2 Matchboxes, some RF filters and 11 servos. BVM provides a very complete list of required “radio control components” in the back of the manual.

Unlike most BVM kits, the plans for the King Cat are drawn in 1:3 scale. Dimensions are provided where needed and control linkage details are drawn full size. The plans are augmented by addendum’s and drawings for the air system schematic, servo extensions, fuel cell construction, Smooth Stop,UAT and brake, tire and wheel assembly. The kit is customized for JR servos and radio (specifically the 10X) and a JetCat turbine. If you use these products you will not have to make or modify any servo cut outs and your component tray layout and attachment is 100% complete. Other radio brands and engines are compatible with the King Cat but will require some modifications such as I had to do with my AMT-280 engine.

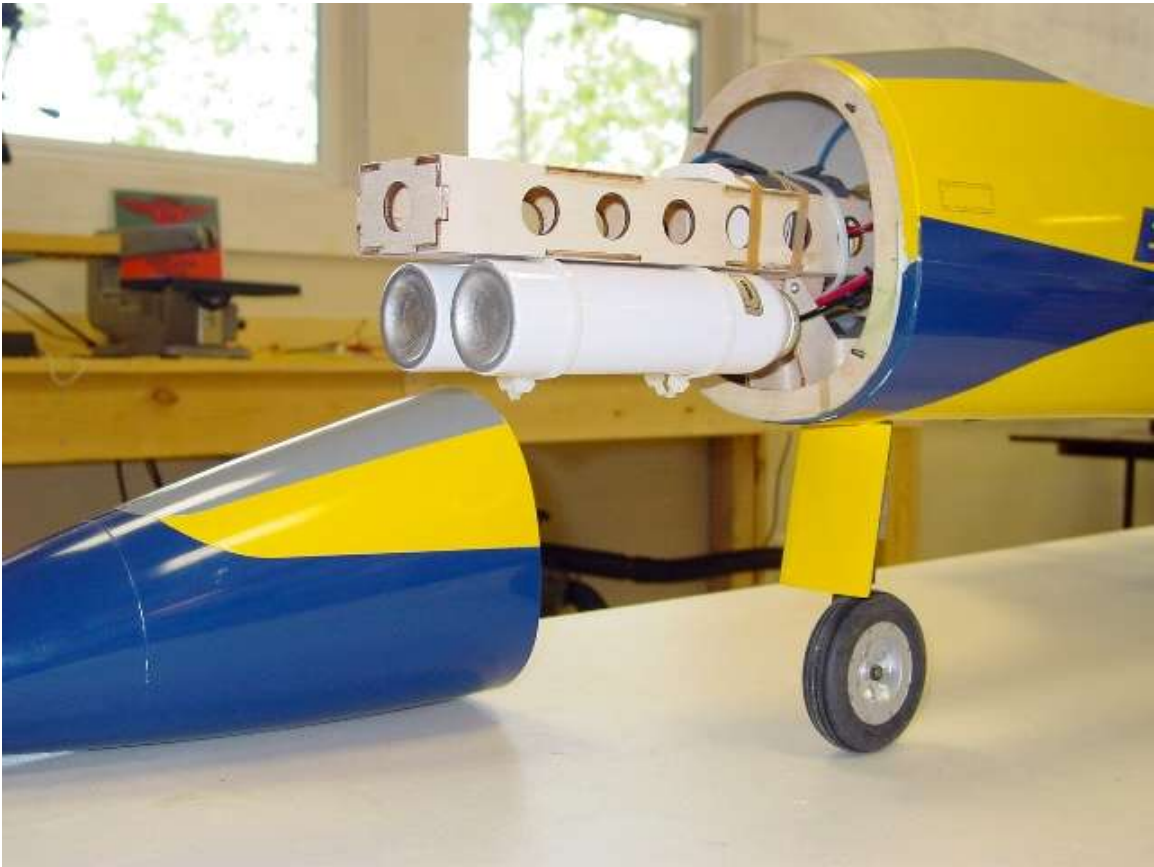
There are a lot of things I like about the King Cat and here are a few in no particular order. First of all the landing gear is very large and beefy with 3 ½” wheels on the mains and 3 ¼” on the nose. In addition to the large duro (shock) struts, the main gear are further cushioned through the design of the “flex” plates on which they are mounted. The plates are “U” shaped and bolted down at the base. The flex arms “float” and are allowed to bend upward against a hard rubber insert when the gear is compressed (such as upon landing). The result is a landing gear system that should perform well on grass fields and have the ability to withstand the inevitable “whoops” landing. I also like the single-pushrod nose wheel steering control (similar to the Bandit and Maverick) as opposed to the cable pull/pull BVM uses on most of their larger landing gear. It is a simpler and easier system to install and maintain.

Ease of access is also a big plus on the King Cat. The large nose cone is completely removable with four 4-40 screws. This gives you great access to the nose gear and custom “battery box”. The battery box itself is easily removable (**Photos 4 & 5**) and is very convenient for mounting your batteries and air tanks. Unfortunately, the Duralite batteries recommended for the King Cat do not fit the box as designed and you have to cut out the top to get them in. The larger height of the Duralites also prevent you from mounting the 3<sup>rd</sup> air tank on top of the battery box as shown on the plans. Fortunately the 3<sup>rd</sup> tank fits just fine along side the nose gear retracts and can be secured to the fuselage side with strips of sticky backed Velcro.

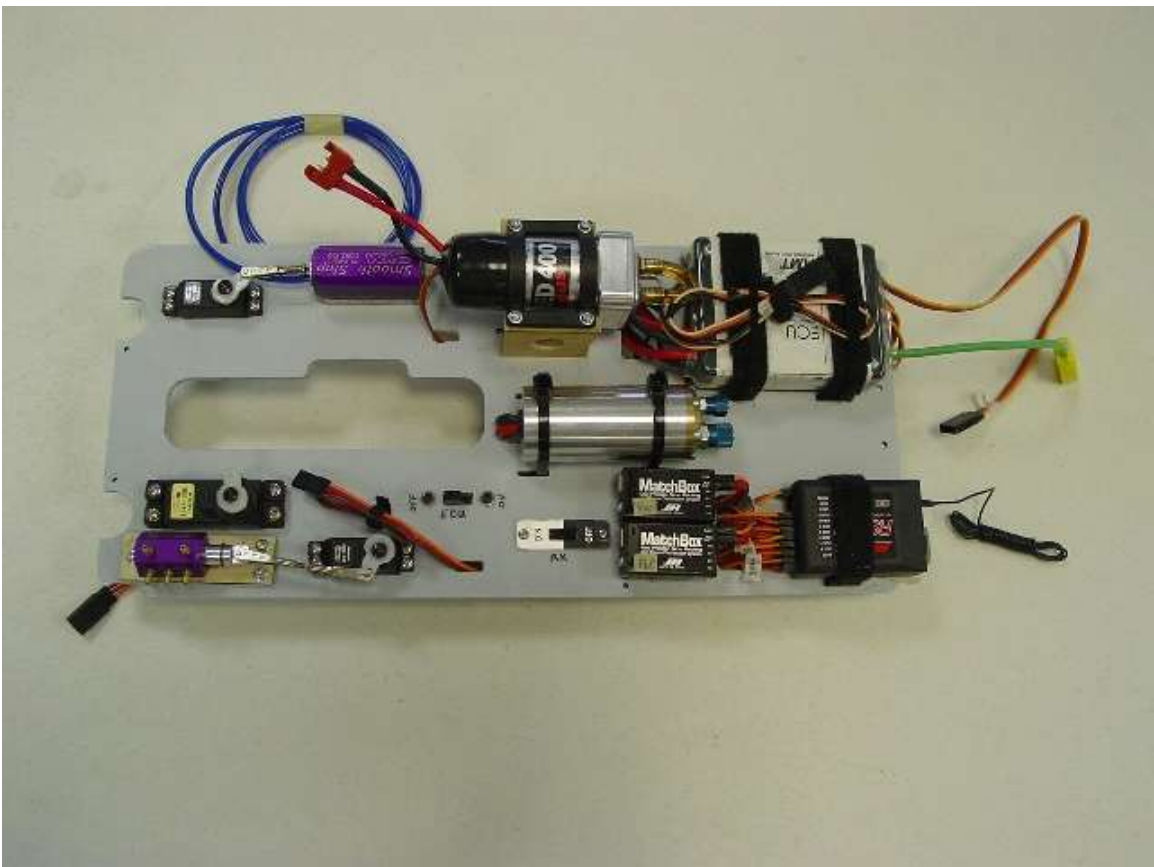


**Photo 4**

Battery box as assembled from laser cut plywood.  
Note cutout in the top to accommodate Duralite batteries.



**Photo 5** - Battery box installed in nose. Removes easily with 3 screws.



**Photo 6** - Assembled component tray. Excess wires are neatly bundled and tie wrapped underneath. Note the TamJets smoke pump just forward of the ECU.

The large, removable component tray is also a great help during installation (**photo 6**). As you can see from **photo 7**, there is lots of room in the fuselage and you can access and service all the radio, fuel and engine components with relative ease.



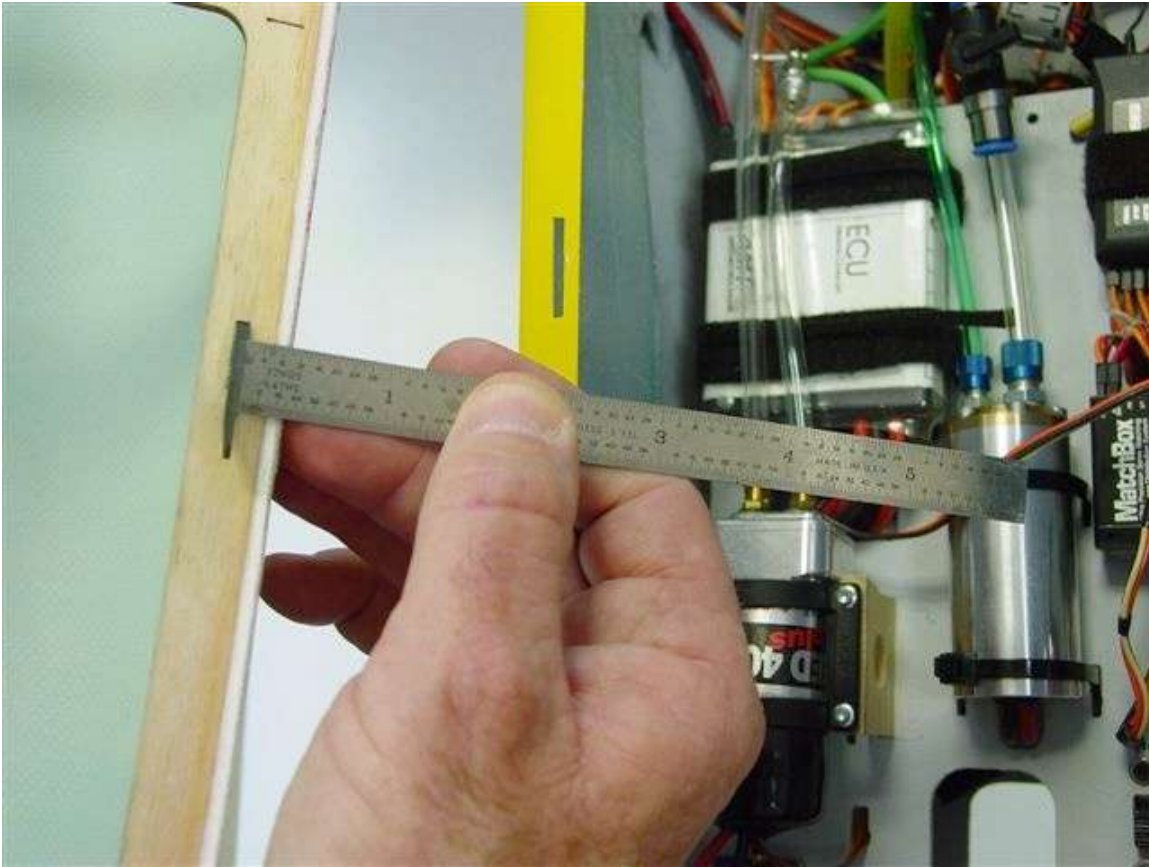
**Photo 7** - Roomy fuselage interior.

Note 3<sup>rd</sup> air tank (upper left in photo) sticks out over the brakes servo but does not interfere. Charge plugs and air fill valves are neatly attached to the fuselage sides with Velcro (not visible).

I did not discover any significant problems with the King Cat construction but there are just a few things you need to be careful about. The first and most annoying was the difficulty in not getting CA or Aeropoxy fingerprints on the finished surfaces. BVM cautions you about this in the manual and suggests you wax the model with an automotive product before you start construction. I was too lazy to do this and I wasn't sure what effect waxing would have on subsequent painting and trim details. I tried to be as careful as possible but still ended up with some blemishes. You can rub out the minor stuff but a good criminally identifying CA fingerprint ain't coming out. Oh well, nothings perfect and I will always have a positive "proof of builder" ID on my airplane.

A couple of other things to watch for; make sure you orient the vent fittings correctly on the main fuel cells. The King Cat uses the same kevlar fuel cells as the BVM F-100 but they are oriented with the curve *outward* into the wing stub versus the *inward* (wraparound-the-bypass) orientation on the F-100 and as shown on the addendum drawings. I got mine wrong but was able to twist them to the proper direction after the glue cured and I realized my error. I would also suggest that when possible, you measure and double check locations before drilling or cutting. Most of the "scribe" marks and measurements were accurate with the exception of the canopy hook cutout locations on the fuselage. Install the hooks in the pre-cut plywood canopy slots but then carefully measure the distance from the edge and transfer this measurement to the fuselage (**photo**

8). My scribe marks were off 1/16 to 3/32's and this would have caused a noticeable mismatch with the canopy to fuselage fit. Be sure to do one hook at a time like the instruction manual says.



**Photo 8**

Carefully measure this hook-to-canopy edge dimension and transfer to fuselage flange before cutting slot.

Fortunately this was the exception and for the most part everything else fit and lined up almost perfectly. The major alignment of the booms, stab and wings is assured with the factory installation of formers, major phenolic tubes and pre-drilled holes so it is almost impossible to screw up the important angles of incidence. The model is held together with a single carbon fiber “tongue depressor” on each side and a couple of 4-40 screws. It can be completely disassembled (booms, stabs and wings) by the removal of 4 more screws holding the stab to the booms. These last few photos (9, 10 & 11) show the finished King Cat.



**Photo 9** – Finished engine detail.

All engine leads feed through hole in aft fuselage and are routed to the forward fuselage.



**Photo 10** – Finished King Cat. It weighed in balanced right at 27 pounds. The extra weight of the smoke system perfectly offset the slightly heavier AMT-280 turbine.



**Photo 11**  
Ready to fly!

Overall, the King Cat is a notch or two above the typical BVM kit in terms of detail of instruction, accuracy of fit and customization of parts to the model. For example, there is a different custom carbon fiber control horn for each of the primary control surfaces and the flaps. The result is a model that requires very little personalized “engineering” and very few tasks that slow you down due to high difficulty factors. Progress is rapid and steady. The King Cat is well suited to new turbine or jet modelers but their pace of construction may be a little slower than those of us who are more familiar with BVM building techniques and hardware.

The King Cat is also a great flying jet with an amazing range of slow to fast flight and acrobatic maneuvers. Rather than write an article on it’s flying qualities, Georgia Jets members are invited to come on out to the flying field, get on the buddy box and find out for yourself. For more information on the King Cat, visit BVM’s web site at [www.bvmjets.com](http://www.bvmjets.com) and look under “jet kits”.