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APOGEE PEAK OF FLIGHT NEWSLETTER

How are your flying skills?

By Tim Van Milligan

It is pretty simple to judge building skills of a modeler. You can physically look at the rocket and tell by the quality of the craftsmanship. Are the balsa fins airfoiled, or are they just rounded off. Is the model bare, or painted?Are the fins glued on straight, or are they crooked. Are they evenly spaced around the perimeter of the rocket? Are the grooves in the tube filled? Is the rocket multi-colored, or just a solid color? Are there fillets along the edges of the fins?

But judging a person's flying skills is much harder. One way that I can tell is how a modeler chooses a motor for the rocket.

Do you know how to select a proper motor for your rocket? Or do you ask someone else for assistance? Being able to choose the right motor for the rocket, is just part of what I call "flying skills."

I'm often asked by competition modelers for advice on selecting motors for different competition events. They'll often say: "what is the best motor for such-n-such event?" To me, this question lets me know the person is lacking in their flying skills. Because if they had sufficient flying skills, the question would be phrased much differently. They'd first tell me about the physical size of the rocket: how big in diameter, how much does it weigh, how many fins, what airfoil shape is used on the fins, the predicted drag coefficient, the engine mount size, and then stability margin. Then, they'd tell me about the wind conditions of the launch site, and how they plan on launching the rocket. Such as: launch rod, rail launcher, and piston launcher.

Finally, they'd let me know the purpose of the flight. Do they want to gain maximum altitude, or maximum speed. Do you want highest reliability, or is the model going for broke?

Wow! Look at all these factors are used to determine what motor should be selected. And that is just one portion of "flying skills."

The other big "flying skill" that I am concerned about is how a rocketeer preps the model for flight. Is it a race against the clock, or do they prep the model as if the rocket was worth a million dollars?

Does the modeler carefully inspect his own rocket for defects? Do they pull out the shock cord fully and give it a good hard tug? Do they inspect ejection baffles? Do they wiggle the motor mount to see if it has come loose on the last flight? Do they wiggle the fins to see if any hairline fractures occurred the last launch? Does the nose cone fit properly?

Does the person carefully fold the parachute before inserting it into the tube, or do they wad it up and jam it in? Once the chute is in the tube, do they check it to see if it will eject easily? How is the motor installed. Is it securely fastened so that it doesn't move either forward or rearward?

Finally, the last flying skill is what I call "good judgment." Does the modeler know enough about the flight characteristics of the rocket to judge whether or not it should be flown? I often see modelers arrive to the range after not having launched a rocket in a couple of months. They show up with a brand new rocket; and they are determined to fly it under any circumstances; because they know that they won't be able to launch again for another couple of months. So they want it to fly "TODAY." Even if the wind is blowing 20 miles per hour.

Not flying that rocket takes a lot of guts, and is a great measure of a modeler's flying skills.

So how do you acquire flying skills? The only way is to practice, practice, practice. It could take hundreds of launches before you feel comfortable.

Because larger rockets can be expensive, I recommend that new modelers stick with low power rockets for a long time before graduating up to the bigger ones. In my opinion, it takes a lot of bravery for these people to fly the smaller rockets while there is a lot of peer pressure from others to launch the bigger ones. In the long run, this patience will pay off. When they launch their rockets, they will be more successful,

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and they'll get them back to fly again another day.

The newer way to gain experience is to run computer simulations. In my opinion, the best program to use is RockSim. It will allow you to design a variety of models and test them under different launch conditions, and with different motors.

What I suggest you do is to download some of the designs of other modelers, and erase the simulations that they've run. Then, look at the model, and make a guess as to what motor you think would give it a good flight. You can do this with dozens of different designs. The more you play with it, the faster you'll acquire good flying skills.

In a future article, I'll try to give you some guidelines and criteria for what makes a "good" flight.

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