Exponential: Expo is a program on most computer radios that allows you to adjust a nonlinearity of the stick movement relative to the servo arm output. In most cases pilots use expo to soften the feel of the stick around the neutral position, especially when there is a lot of surface deflection. To create a softer feel you are moving a portion of the servo travel to a different area of the stick deflection—in this case, further out in the travel. So the servo moves less near the center of the stick position and exponentially moves more as the stick moves toward full travel.

Here's a funny fact that shows a need for standardization. With a JR radio you want to dial in positive expo for a softer neutral area but a negative value is needed with Futaba. Be sure to read your owner's manual! Because I can't climb into your shoes, I cannot give you a positive starting point for setting expo on this airplane. You will need to do it for yourself. The trick is to set a value and try it. Change one setting at a time and find the value that works best for you.

Following is what I have set on my Extra at max 3-D deflection: aileron, +50%; elevator, +55%; and rudder, +30%. I have expo for precision too, but it's slightly different; aileron is + 30%, elevator is +30%, and rudder is +40%.

You can see that my rudder expo is higher for precision than for 3-D. That's to try and smooth out any rudder wobble while flying precision maneuvers. You can really effect some big changes with expo that can gain big advantages by smoothing out your flying around the center of the stick while allowing a large amount of control deflection right at your fingers if you need it. There's also the possibility of too much of a good thing, so be careful and don't numb out the center of your radio's stick completely. Once you're comfortable with the airplane, give it a try and don't be afraid to experiment.

Balance: The center of gravity (CG) located on the plans is conservative, at approximately 32% of the chord at the mean aerodynamic center (MAC). I fly my plane at this forward position and it works great for 3-D and precision flying. It's safe to locate the CG anywhere between F3 and the forward edge of the wing tube socket. I feel that, within limits, CG location can be a personal preference. Many of the top pilots fly with a forward CG for precision and move the CG aft for freestyle.

Some people believe that you must have a rear-biased CG in order to perform any 3-D maneuvers; that simply is not true. In some 3-D maneuvers a rearward CG will slightly enhance the model's performance, but in most other flight attitudes the performance will suffer. I prefer to lose a tiny amount of 3-D performance to keep the rest of the aircraft's integrity intact, yet with practice, I'm able to perform any 3-D maneuver.

Trimming: Decidedly, trimming your airplane for neutral flight is the difference between a plane that flies well and one that you fight to keep on track. Trimming a model properly is also one of the most overlooked steps in readying it for competition. Hey, it flies pretty well right off the blocks, so why spend so much time on a few minor changes? It does take a bit of time to get everything right. I've spent almost 100 flights getting one of my competition airplanes to where I wanted it. No, it wasn't a problem airplane; on the contrary, it was fantastic and that's why I knew it had so much potential to be close to perfect.

Some of the things you want to look for are the ability to fly precision up- and down-lines, 45s, and loops without the need for stick input. There are many good trimming procedures and charts available that can take you step by step through the procedure, and I would most likely be doing you a disservice if I tried to make a condensed version here, so take a look online. You can download a chart from the National Society of Radio Controlled Aerobatics at www.nsrca.org/trimA.htm. While you're at it, take a look at the Web site; these are the people who lead the way in precision aerobatics.

Common Mixes: Most Scale Aerobatics (SA) airplanes have some form of unwanted coupling to the rudder. In an ideal scenario, rudder movement would impart yaw only, but with many Scale aircraft the rudder will also effect some roll and/or some pitch. Those are things we don't want for precision flying, so it's a common practice to create a mix to trim those attributes out. After you're comfortable with how the airplane flies, you can start to add these trimming mixes.

For the rudder coupling, check the trim by flying the airplane in knife edge. Set the mix by flying at an even medium speed with only enough rudder to sustain level knife-edge flight. Many of today's computer radios have special mixes just for this trimming procedure. I believe that all of JR's computer radios from the 662 up to the 10X have this specific feature.

The rudder is always the master channel. Aileron will be slaved for roll, and elevator will be slaved for pitch. The amount of mix depends on your model and a variety of dynamic forces that can change, such as atmospheric density, balance, airspeed, servo power, and so on. So, no matter how well you dial in the mix it will never be 100% foolproof and your model will more than likely be somewhat different than the next flier's.

It's also quite common for the mix for left rudder to be slightly different than the mix for right rudder, so you will have to trim those tendencies out one step at a time. Our Extra does not have any roll coupling but Scale aerobatic airplanes will commonly have about a 2-4% mix. This model does tuck slightly, so I have 10% up-elevator mixed for left and right rudder. That number would decrease with a more rearward balance. To be conservative, start with approximately 5% up if it tucks to the gear or down if it pulls to the canopy, and decide from that point if you need more or less mix.

I like to put my mix on a switch so it can be defeated if necessary. The switch could be useful when performing rolling maneuvers such as a slow roll or a rolling circle, where you are flying through the maneuver with all of the controls in sync, but (to be honest!) I leave the switch on all the time.