

## Training

In the January training column we mentioned how successful flight of an RC plane requires many things, one of which is the proper performance of all the many mechanical parts and pieces. For April we will touch on just a couple of the many mechanical issues that can “make or break” the proper flight of your airplane. Hopefully this information will help the student pilot get his plane set up properly for reliable flight during his flight training and beyond. It will save time and perhaps lead to a better training experience if a student’s aircraft is mechanically sound when he comes to the field. It can often be more difficult to make changes at the field.

Remember that the flight of an aircraft is directed by the movement of several control surfaces as well as the throttle. Each of these in turn is moved by the little black box we call a “servo”. For the most part, servos will give you many, many hours of trouble-free service. Also, in most aircraft the hinges that allow the surfaces to move are pretty trouble-free. The area that generally causes the most significant risk to safe flight is the **linkage** between the servo and the part to be moved. The goal of course is to have it be reliable (not fall apart) and free of any binding or interference with other mechanical or electrical parts. We also need the control surface to move as the designer intended for proper flight. The responsibility for making it that way rests with you, the builder. Even with an “ARF” this is not done for you and there can be many pitfalls waiting.

Usually, with an ARF, you can use the linkage pieces that come in the box. They may be cheap, but are generally adequate (a notable exception will be discussed in a future column). What is important is to **analyze each piece** and do whatever you can to **make it work as intended**. For example, the wire or rod from servo to control horn must run freely through the holes in the fuselage and meet the control arms at the right angle for proper operation. You don’t want any bends that will catch or bind at extreme throw, or any bent ends that are too long and may catch on something. Also, you need to assure yourself that the linkage won’t come loose and fall apart. Remember to use a piece of fuel line on those little white clevises to keep them snapped together. They **will** come apart under load if you don’t. Each type of linkage end has different attributes and different inherent dangers. Again, the builder should try to analyze each and help it to do its intended job. Don’t hurry this part of the assembly! Also, feel free to ask any club member or the training staff for help or advice.

Setting the throws and center points of the servos is also very important. In most cases you want to have the servo in the center of its range of motion when the surface controlled is centered, and at that point, the servo arm should be placed on the servo shaft so it is perpendicular to the linkage. Also, generally you want the throttle to be half-open when the servo is centered. It is equally important to get the right amount of “throw” on each controlled surface. With less-expensive transmitters this must be done by selecting the proper holes in the servo arm and control horn and by adjusting the length of the linkage rod. With newer radios, we have the ability to fine-tune this with radio adjustments. In most cases a manual supplied with an ARF will give the builder information as to the proper holes to use in the horn and servo arm. Never allow a servo to reach the extreme end of its range when a “stick” is moved fully. This can drastically increase battery drain and shorten servo life. If you hear a servo “chatter” at full throw check to see why and fix the problem. Again be careful, take your time, and assure yourself that each part will work properly as the designer intended.

The few suggestions given here don't even "scratch the surface" of all the things to consider in properly setting-up a plane, but hopefully reading this will alert the new pilot as to the *kind of issues* to consider and the type of thinking to use to make his airplane all it can be. In future columns we will offer more suggestions aimed at helping newer pilots. Until then...

Remember to try something new each time you fly!

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