

## The Electronics

The electronics line-up for Project Extra will include one receiver and two receiver batteries running through two switches. You can plug the second battery/switch into any open channel on the receiver.

There will be a total of nine servos; two in each wing, two for the rudder, one in each elevator half, and one throttle servo. The wing servos will be mixed like any other two-channel wing so that differential is adjustable. The servos in each wing half will be matched with JR matchboxes. The rudder servos will be mixed through the radio with a multi-point mix.

Okay, I'm gonna take back that frugal comment. Here's where you can save a few bucks or, better, redirect a few coins towards getting the right servos and hardware. Exotic electronics, multiple receivers, optical isolators, regulated batteries, power distribution systems, etc. are not needed in this airplane. They all do a job and they do that job just fine, but in my experience, complex electronics are just not necessary for you to have a successful 35% competition aircraft that is safe and reliable.

For some of the larger airplanes with more servos and bigger control surfaces, sophisticated electronics can become a must, and in fact I have some of those systems in my own 40% aircraft, but for this project I'd like to keep it simple and concentrate on making the set-up secure.

Okay, I'd bet that it may be a letdown for some of you that we aren't going to discuss those systems, so here's a bone. I'll highlight sophisticated electronics in an upcoming Scale Aerobatics column. And, although two receivers are not needed for this airplane, if you'd like to learn more about multi-receiver systems, you can find some information in the *Model Aviation* Scale Aerobatics column from May 2002.

One thing that separates the big airplanes from the smaller ones is the amount of vibration that the aircraft and all of its components will experience. No matter what engine you use for your Giant Scale airplane, it will have harder vibration pulses and all of the electronics need to be isolated as much as possible.

On the subject of redundancy, most receiver failures are due to vibration, so proper isolation mounting should help to protect your receiver. Even the material that you use to fasten your components to the aircraft are important. A heavy nylon tie will transfer vibration more readily than will a soft Velcro strap.

Both Erik and I like to use the Dubro foam rubber sold in hobby stores. It's exactly the right density for protection from vibration. A piece of ½-inch Dubro foam under your receiver, battery, or ignition module fastened with a Velcro strap will work fine. If you are going to use nylon ties it would be a good idea to wrap the entire component before it is tied down. I've seen a lot of airplanes out there with electronics Velcro-fastened directly to the airplane's wooden structure. That's taking a risk, in my opinion.



Let's talk a little about servos and control linkage hardware and why we've chosen the parts that we'll use.

In doing research for the Scale Aerobatics column I've had the chance to do some testing and evaluation of control rods, horns, connections, systems, and servos. Servo choice is always an interesting topic because there are so many brands and so many opinions. My opinion is that it's important for builders to stick with name brands that have been proven to perform safely and accurately on large scale performance aircraft. Futaba and Airtronics make great servos for Giant Scale. My experience has been that the JR digital servos stand out in precision, performance, and reliability. We chose to use JR DS8411 digital servos for this project. They have a rating of 155 in. oz. of torque and a speed of 0.16 s/60 ° at 4.8 volts.