

### The 2.4 GHz R/C Revolution (part 2 of 2) by Patrick Willis

**DISCLAIMER:** *I make no claim to be an expert, but I've learned a few things over the years. Anything I write is my opinion based on my experience. Take it for what it's worth and feel free to disagree. -Pat*

Futaba has long been one of the big names in R/C radio gear and was the first to introduce PCM systems to the market, about 20 years ago. When Spektrum came along, the loyal Futaba fans were left wondering what Futaba had up their sleeves. The wait was a little too long for some folks, who left Futaba and pursued 2.4 with Spektrum. However, Futaba eventually released FASST: a FHSS, (Frequency Hopping Spread Spectrum) module for its frequency module-equipped radios. As an owner of a Futaba 9C, I anxiously awaited the release of the module, only to be disappointed by the module only supporting seven channels.

Since Futaba's 7 channel radio system, the 7C, was not module-based, it did not make much sense to release the module with only seven channels. The Futaba systems boast a single receiver, as opposed to the JR/Spektrum main receiver plus one or more satellite/mini receivers. The Futaba receiver has two short wire antennas and is constantly shifting frequencies, several times per second. Futaba has, since their first 2.4 GHz module was introduced, released additional modules with support for more channels. They have also released the 6EX on 2.4 and the 7C on 2.4 with some software upgrades making it more versatile than it was originally. The 9C is being discontinued and replaced with the 10C, which, although more expensive, is a higher-end radio in the middle/intermediate level of the market. Then there are the 12FG, 12MZ, and 14MZ, which are aimed at those with bigger wallets that want all the features that high-end radios have to offer.

All of these are available on 2.4 GHz using Futaba's FASST technology.

Futaba had some issues early on as well when some receivers overheated unexpectedly. They came out with service bulletins and quickly offered to update all components free of charge.

XPS, (Xtreme Power Systems) sells modules and receiver upgrades only. Their big advantages are that the receivers are small and have only a small, 1 1/2" nub for an antenna that pokes out of the top of the receiver. They also utilize a frequency-hopping technology that predicts noise or interference issues and changes frequencies as needed. They recently came out with a new firmware version that employs FHSS and their original predictive technology, which can be switched to one or the other as desired by the user. XPS remained competitive for those that did not want to spend as much as Spektrum and Futaba were charging. However, there have been reports of unexplained signal loss on the XPS online forums, (as there have been on the other radio manufacturers' forums as well) and some have attributed it to flaws in the XPS system. There have not been any independent, reliable tests done to my knowledge, so these issues may have had nothing to do with XPS specifically.

Airtronics came into the game fairly late; however, they came on strong with an upgrade to their existing 8 channel radio and made it more affordable than the others. Their RDS8000 on 2.4 GHz costs only \$229.00 with receiver, and last I heard they were throwing in an extra receiver at no additional cost. They will soon be releasing a more expensive but feature-rich 10 channel system which makes it look like they are getting back into aircraft systems with a

## Sharing Channels continued

vengeance. Their 2.4 GHz technology also uses a FHSS technology. Not as much is known about the Airtronics radios, simply because they have not been out as long, but if internet chatter means anything to you, they may be well worth the wait.

Yours truly has been using XPS in his Futaba 9CAPS radio for over a year. I'm happy with the system and I really don't have any major complaints. It seems to work as advertised in my giant gas-powered planes, electric helicopters, glow helicopters, and glow airplanes. I have not once experienced a lock-out, that I'm aware of. I have tested the re-boot of the receiver on the ground using a battery with little charge left. The LED light on the receiver began to flicker as I moved several high torque digital servos around and around. The LED turned to red while doing so, the controls froze, and then it recovered. This took less than a second each time, leading me to believe that if my batteries became low while airborne, I would likely be able to recover.

So, which should you get? Or, maybe you're wondering, should you get any of them at all? Here are some things to keep in mind:

--Nothing beats a good installation, period!! If you are using a noisy electronic speed controller, gas ignition, or something else that sends out RFI, 2.4 is not the magic cure-all upgrade. I have experienced interference from ESC's and ignition units on 2.4 GHz that were only resolved by cleaning up the installations. You still have to maintain space between ESC's or ignitions and other wiring inside the aircraft. The RFI will travel not through the receiver's antenna but straight through the servo wires to your servos, causing erratic servo movement and/or loss of control all together. ALWAYS RANGE CHECK according to the manufacturer's instructions, with the motor

running and with it turned off, (notice that it was so important that it was in bold, underlined, capitalized, and italicized print!).

--If it ain't broke, why replace it? If your current system works flawlessly without interference, why change? Some of the professionals and all-around hot dog pilots have noticed increase response from some of these systems, and testing data has confirmed that the latency is lower in many of the new systems. Most of us won't notice a difference, but if you think you may, this could be a good reason to upgrade.

--The receivers, modules, and transmitters of the various 2.4 GHz systems are not interchangeable. They all use different proprietary communication protocols; therefore, a Futaba FASST transmitter or module cannot communicate with anything but a Futaba FASST receiver, and the same applies to mixing/matching any of the brands.

--They can be pretty pricey, so why not go with one of the cheaper brands? Well, you may get what you pay for, or you may be plenty happy with them. I only have personal, hands-on experience with the first three mentioned brands, and they all worked very well when used properly.

--If you use high torque digital servos, you will want to switch to 6 volts. Even if you use standard servos, I would recommend switching. No, you don't need a regulator, unless your servo model specifically says it is for 4.8 volts only, (mostly micro servos and some gyro-specific servos for helicopter tail rotor control). This makes it less likely that your new 2.4 GHz receiver will need to re-boot due to low voltage spikes.

If I can be of assistance answering additional questions, please email me at [p-willis@msn.com](mailto:p-willis@msn.com) or ask me the next time you see me at the flying field.