Programming the Spektrum DX6i
by Dick Martin

Editor’s note: In an attempt to inject a little levity into a somewhat tedious process, the author may have made the 2.4 GHz spread spectrum DX6i appear to be poorly designed and not worth the hassle required to make it work. **Do not be misled!** If you are contemplating switching to a DX6i, particularly if you presently use a 75 MHz radio, do not let this article dissuade you from acquiring this well-engineered instrument which, once you get it programmed, will greatly improve the quality of your RC sailing life and those of race managers and regatta chairs who will no longer have to worry about channel conflicts with your radio.

I am instructionally challenged. I found the 95 page owner’s manual for the original Spektrum DX6 (written as though fixed-wing aircraft and helicopters were the only models that would ever use it) virtually incomprehensible. Fortunately Chuck Winder wrote a set of DX6 programming instructions for dummies (i.e., sailors like me who never flew model airplanes) which was included in his article entitled “Spektrum DX6 RC System,” published in *Model Yachting* in the spring of 2006.

Recently I had to replace my old original DX6, and thus I found myself confronted by the Spektrum DX6i manual (this time it’s 138 pages long), and a transmitter that must be programmed with controls and menus that differ from those of the original DX6. Fortunately, the principles are basically unchanged, and Chuck’s old set of instructions served as the Rosetta Stone that allowed me to translate from aviator-speak to sailor jargon, and successfully program the 6i with only a few epiphanies and references to the parentage of the engineers who designed the thing and wrote the manual. Since I fear I may need to program it again someday, I made notes about the steps I took. Perhaps some other 914er somewhere suffers from a handicap like mine and will find the following CR 914-specific programming instructions helpful. When (if) you try to read them ‘cold’ they likely will seem at least as dense as I accuse the DX6i manual of being. With a live transmitter in your hands, however, I think you will find it easy to follow the steps in this DX6i programming cookbook. Please note, however, that this ‘recipe’ is not intended to completely replace the manual. Be sure to read pp. 6-23 and 136-137 for important general (and easily comprehensible) information about operating the DX6i system.

**Preliminaries**

**Control stick adjustments** – If you, like me, find horizontal motion of your sail-control joystick and vertical motion of your rudder joystick distracting, take advantage of the method for adjusting joystick tensions described on page 12 of the DX6i manual. Open the back of the case (remove six screws); then mark-depress or rotating a large roller switch (which rotates a little too easily past the notch you want when you try to work too fast). A few minutes of practice before you set out in earnest will reduce aggravation later on. When the transmitter is turned on you will

Panel 1

**The programming process** – All programming is carried out by either depressing or rotating a large roller switch (which rotates a little too easily past the notch you want when you try to work too fast). A few minutes of practice before you set out in earnest will reduce aggravation later on. When

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see the “main screen” shown in Panel 1. To initiate programming, momentarily depress (click) the roller switch. That takes you to the first screen of the first of two menus (for some reason they are called Lists). This one is the Adjust List (see Panel 2). When you arrive there the word “Main” is highlighted to indicate it is live and that if you depress the roller now you will return to the Main screen. Don’t do that now; instead become familiar with the roller and how it operates—and how easy it is to overshoot with it. You’ll discover that the “Main” button becomes highlighted when you reach the extreme left or counterclockwise end of 9 active roller notches on the Adjust List screen. Each notch highlights a type of adjustment that can be made, several of which, such as flaps, are irrelevant for our simple boats (I was surprised to find that spoilers and bomb bay doors didn’t make the list—I guess Spektrum is saving them for the DX8i). Each time you roll to a new notch those items scroll up from the bottom of the screen, sequentially becoming highlighted one at a time. The first and last items on the list when highlighted disconcertingly appear alone, but in between those extremes three items appear at a time, the middle one of which is highlighted. The 9th and last item on the list when highlighted one at a time, the middle one of which between those extremes three items appear alone, but in its memory as an acro, and then with the roller shift the highlight to List. The Main screen should light the “N” next to “ACRO” rather than, say, PLN or AIRP—perhaps RC aviators have acrophobia, or maybe that’s an acronym.) The DX6i will beep to impress you with how clever it is while it records that your sailboat will be stored in its memory as an acro, and then with the roller rotate the roller one notch to change the “N” to “R” (which will also change the control is set to “N” for Normal. If you want your sail joystick to trim in the sheets when you pull it toward you, the way most sailors do, then scroll to highlight the “N” next to “ACRO” (“ACRONY” controls the sheets), click on it and then rotate the roller one notch to change the “N” to “R” (which will also change the little switch icon so its handle points up—see Panel 5). Click once to make the DX6i remember your selection, then scroll back to highlight List (ignore the other four controls on this screen) and click to return to the Setup List screen.

Step 2. “Wing tail mix” That’s what the DX6i calls a function that simply will not translate into our native tongue but must be set correctly (don’t worry about the “why,” just trust me). From the Setup List screen rotate the roller 6 notches to the right to highlight Wing Tail Mix, then depress the roller to bring up the Wing Tail Mix screen. Be sure that all three items on that list show inhibited to indicate that they are “Inhibited.” Click the roller to return to the Setup List.

Step 3. Servo direction Now rotate the roller 2 notches to the left to highlight Reverse, then depress the roller to bring up the Reverse screen shown in Panel 5. Be sure the “Aile” control is set to “N” for Normal. If you want your sail joystick to trim in the sheets when you pull it toward you, the way most sailors do, then scroll to highlight the “N” next to “ACRO” (“ACRONY” controls the sheets), click on it and then rotate the roller one notch to change the “N” to “R” (which will also change the little switch icon so its handle points up—see Panel 5). Click once to make the DX6i remember your selection, then scroll back to highlight List (ignore the other four controls on this screen) and click to return to the Setup List screen.

Step 4. Rudder adjustments a. Travel — Remember: the DX6i thinks you turn your boat right or left with ailerons, not the rudder. So when you program the rudder joystick ignore things that say Rudder and work with Aile instead! Now, with your boat electronics turned on and the transmit-
ter communicating with the receiver (wiggle your rudder joystick to be sure it is), adjust the boat’s rudder servo horn and linkage if necessary so the rudder is fairly parallel with the keel. Then, from the DX6i setup list screen, rotate the roller until adjust list is highlighted in the middle of the screen. Click once and then scroll three clicks to highlight travel adj. Click once to bring up the travel adj screen shown in Panel 6. Scroll until the 100% next to aile (not rudd, remember) is highlighted. Move the rudder joystick to the extreme right and left ends of its range and see how far your rudder moves; if you want more rudder travel, with the joystick pushed to the right rotate the roller to the right to deflect the rudder further rightward until you like the way it looks (I set mine at 120%). Now push and hold the rudder joystick to the left (you will see the number return to 100%) and holding the joystick there rotate the roller until the same number as your rightward deflection (e.g., in my case 120%) appears. Then click the roller to implant these adjustments in memory. Click the roller to call up the sub trim screen shown in Panel 7. All the controls should show zeros. If you need to tweak your rudder to get it perfectly centered, proceed as follows. Scroll to highlight the zero after aile, click on it, and then rotate the roller until your rudder is perfectly centered. (This adjustment moves the rudder in very tiny increments; I had to roll the roller 15 notches to the right to correct a 1° deflection to the left of center that was present after I had programmed my rudder’s travel to 120% both ways in Step 4.b. Which is why Panel 7 shows 15 after aile).

b. Sail servo travel – Now access the adjust list screen. Scroll until travel adj is highlighted, then click on it to access the travel adj screen shown in Panel 6. Scroll until the 100% next to throt is highlighted. Now, carefully move the sail joystick to trim the sails, all the way to its fully trimmed position if the mainsheet does not become taught and the sail servo begin to hum. (If necessary, reposition the servo arm on its shaft and readjust the attachment of the common sheet to the cockpit floor so that, with the joystick in the fully trimmed position, the sail servo arm is pointing at around 11:00 relative to the bow, the knot connecting the common sheet to the main and jib sheets is about 1/2 inch forward of the turning block on the aft port deck, and the mainsheet is not quite taught. Now, with the joystick still fully trimmed in, rotate the DX6i roller control clockwise (to the right) until the mainsheet just becomes tense. The sail servo arm should now point somewhere around 11:30 and the common sheet knot should be 1/8 inch or so forward of its turning block. If not, tinker with the position of the servo arm on its shaft and the common sheet adjustment until those conditions are met. With my boat, on the travel adj screen throt reads 125% when I finish this process.

Step 5. Sail control adjustments
Thus far you have not touched the sail joystick, which should have been roughly centered when you first turned on the transmitter. Note that it may be possible to over trim the sails before you have adjusted the sail (throt) control. Over trimming, particularly if it occurs suddenly (for example, if the sails are out but the sail joystick is in the fully-trimmed position before you turn on the transmitter) can create a force sufficient to break something. Be careful when you trim in with the sail joystick.

a. Sail servo position – Access the main screen (that should be a piece of cake by now) and, if necessary center the ‘needle’ of the sail trim gauge (the white vertical bar at the left side of the screen) with the black switch to the right of the sail joystick. With the sail joystick in the center of its range the sail servo arm should point at roughly 9:00 relative to the bow. If not, reposition the arm on its shaft so that it does.

b. Sail servo travel – Now access the adjust list screen. Scroll until travel adj is highlighted, then click on it to access the travel adj screen shown in Panel 6. Scroll until the 100% next to throt is highlighted. Now, carefully move the sail joystick to trim the sails, all the way to its fully trimmed position if the mainsheet does not become taught and the sail servo begin to hum. (If necessary, reposition the servo arm on its shaft and readjust the attachment of the common sheet to the cockpit floor so that, with the joystick in the fully trimmed position, the sail servo arm is pointing at around 11:00 relative to the bow, the knot connecting the common sheet to the main and jib sheets is about 1/2 inch forward of the turning block on the aft port deck, and the mainsheet is not quite taught. Now, with the joystick still fully trimmed in, rotate the DX6i roller control clockwise (to the right) until the mainsheet just becomes tense. The sail servo arm should now point somewhere around 11:30 and the common sheet knot should be 1/8 inch or so forward of its turning block. If not, tinker with the position of the servo arm on its shaft and the common sheet adjustment until those conditions are met. With my boat, on the travel adj screen throt reads 125% when I finish this process.

Next, with the sails fully trimmed in and the main boom essentially on the center line of the hull, check to be sure that the jib boom points roughly at the aft shroud—where the jib is trimmed properly for a beat. Now carefully push the sail joystick to the other (fully out) end of its range. The servo arm should point somewhere between 7:30 and 8:30 at this point and you should be able to push the main boom forward until it is touching the shrouds. I like to have my jib boom about 5-10 degrees forward of perpendicular to the hull
midline when my sail joystick is fully out, so that the jib presents maximum area to the wind when the apparent wind is at 170-175 degrees relative to my course. To accomplish that I find I must rotate the roller until \( \uparrow 115\% \) appears next to THRO when the sail joystick is fully out.

**Step 6. Transmitter power**

To comply with various governmental requirements, the DX6i can be programmed with one of three different power levels. Mine proved to have been programmed for the European Union rather than the United States. A Spektrum tech told me that the U.S. power setting (of “247”—I have no idea what that number means) is higher than the EU setting of “326,” and several bloggers say that the U.S. setting gives them better range although I was unable to detect a reproducible difference. To check, and change if necessary, access the SETUP LIST, scroll until POWER SETTING is highlighted, click on it, and see what the POWER SETTING screen says. If it says “A-EU 326” or “C-FRANCE,” click again and scroll until it says “B-US 247,” then click again to program that setting into memory.

**Step 7. “Fail-safe” Rebinding**

“Fail-safe” refers to the sheet setting that you want your boat to have in case communication between the transmitter and the receiver fails. To embed the sail control positions you have just finished programming into the transmitter in the fail-safe setting you want to be saved in your receiver, in this final step you need to repeat the binding process described in the preliminary section of this recipe with your sails in the position you want them to be if you should lose radio communication with your boat.

I prefer to have the rudder centered and the sails halfway out because I want the boat to continue moving more or less straight ahead when I lose control during a race, to minimize the danger of interfering with another boat before I can warn other sailors that my boat is out of control. Another approach is to program fail-safe with the rudder hard to port or starboard and the sails nearly fully eased, to make the boat go into ‘orbit’ and more or less stay where it is on the water rather than potentially sail off over the horizon when control is lost.