RCS Radio Control for Live Steam

Tony Walsham of RCS Australia has developed a radio control system specifically for live steam locomotives. His website is www.rcs-rc.com. As you may have read, the product has had positive reviews over the last year in both Garden Railways and Steam in the Garden magazines. The old RCS system has been sold to RCS America (part of Cordless Renovations, known for their battery products) who continue to produce and sell an updated product line. The new live steam system is not available through them.

The system uses 2.4Ghz frequency, Spektrum DSM2 compatible components made by Deltang from the UK. The nicest feature is that it has a transmitter similar in size to the Airwire and Revolution units rather than the large units with joystick or steering wheel controls used for model aircraft and RC cars. Being Spektrum compatible means the new transmitter should bind with existing Spektrum receivers that you may already have.

The RCS "Simplified TX-3" Transmitter meets the needs of most live steam applications. Two channels are available to control direction (Johnson bar) and speed (steam throttle) with fine control capability of each. A third channel which is either full on or full off is available for controlling a whistle, coupler or similar use. The TX-5 and TX-7 transmitter offer additional channels but I currently can't see the need for them.

RCS offers two Receivers in either a manual bind or auto bind version (DSM2-EM @ $19ea or DSM2-EM(AB) @ $29ea). I prefer the 'auto bind' model because in addition to allowing binding to a transmitter without having to access the receiver to install a binding plug, it adds capability to reverse the swing of the servo, the ability to adjust the arc length of servo rotation to limit throw and built in directional lighting with on-board current limiting resistors for headlamp and taillight LED's if desired. This makes servo installation in the locomotive a much easier task and makes adding lighting a possibility.

Any servo can be used, but RCS sells two commonly available Hi-Tec Servos, the 'Mighty Feather HS-65MG' @ $39ea or the 'Micro HS-82MG' @ $29ea. Both are available through them or from local hobby stores. The HS-65MG is slightly smaller but has less torque than the HS-82MG. The reduced torque isn't a concern unless your locomotive has noticeably stiff control movement; however the smaller size may be worth the extra cost if it is the only way to make it fit. Both have metal gears and ball bearings which should make them more durable for live steam applications. To wire everything up, it is nice to use the pre-manufactured leads with receiver compatible plugs.

Here is what worked for me:

TX-3 Transmitter	$99.00	RCS
DSM2-EM(AB) Receiver	$29.00	RCS
HS-65MG Feather Servo (2 @ $39)	$78.00	Local Hobby Store
HT-7342 lead with servo plug	$4.00	RCS
DPDT switch, Mini Jack, Battery Holder	$3.00	KW-Surplus/Deals

Delivery from Australia is free if you have an order greater than $250. It took just over two weeks and came via the Australian and Canadian Postal System, with no duty, no GST and no Broker fees crossing the border (was I just lucky?). AU$ and CAN$ are currently at or near par and they accept PayPal. With no GST, it is actually cheaper to buy the servos from RCS unless you want to support your local hobby store. I used my own switch, charging jack and battery holder from stock with their HT-7342 lead ($4.00) to connect to the servo however, RCS does sell battery holders in various shapes (eg. 4-AA-FLO) for $6 and a wiring harness (HT-7215) that is a combined on-off switch and remote charging jack for $10. Both items are complete with leads and compatible plugs for added convenience.

Here is a picture of the components. The battery pack, DPDT switch and charging jack that I got locally are on the right. The RCS Transmitter is in the middle with the HT-7342 lead with connector immediately above. The Auto Bind receiver is to the left of the transmitter. The receiver has a clear shrink wrap protector around it, but otherwise is pretty bare bones. Notice how small both the receiver and transmitter are using the AA batteries for scale. Both the HT-65MG and HT-82MG servos are on the left. The size difference is minimal, but could be critical depending on the locomotive

To get started, you would buy a single transmitter and a receiver for each locomotive you want to convert. Then add servos (2 per loco), battery holders and wiring devices as required to reach the $250 minimum for free shipping. This shouldn't be a problem if you are converting two or more locomotives. If changing only one, you could combine your order with someone else's to reach the minimum amount for free shipping.

I have converted three locomotives so far and have had the opportunity to test two of them under steam and am very satisfied with the performance of the system. It is a pleasure to be able to control a live steam locomotive with the precision we have grown to expect with battery power control systems like Airwire. A word of caution though… You can link multiple receivers to your transmitter, but the transmitter does not have the ability to recognize individual receivers like Airwire and Revolution where the transmitter remembers the loco number. As a result, the transmitter will control any receivers that were previously linked to it that are turned on. This means one loco at a time operation from a single transmitter (unless you are happy with two locos doing exactly the same thing). Any customizing of the servo direction or throw is stored in the servo's memory, so it should be possible to temporarily link the receiver to a second transmitter during an operating session using the auto-bind feature. Auto bind is active for 20 seconds after turning on the receiver during which time it will bind to any transmitter which is on and has the bind button held down. …very simple. The receiver will then remember the transmitter it was connected to for all future sessions until you re-bind it to another.

Remember though, this is not a re-invention of the wheel, the only real difference between this system and an aircraft converted RC other than the obvious use of current technology, is the size of the transmitter, but in my opinion, that is a major step forward. As noted, I am very pleased with the performance and I plan on buying a second transmitter and enough receivers to eventually convert most of my live steam engines. I already have one engine on the work bench with servos mounted that is just waiting for a receiver!

… Doug Martin, April 2015