Using Tam Valley Frog Juicers

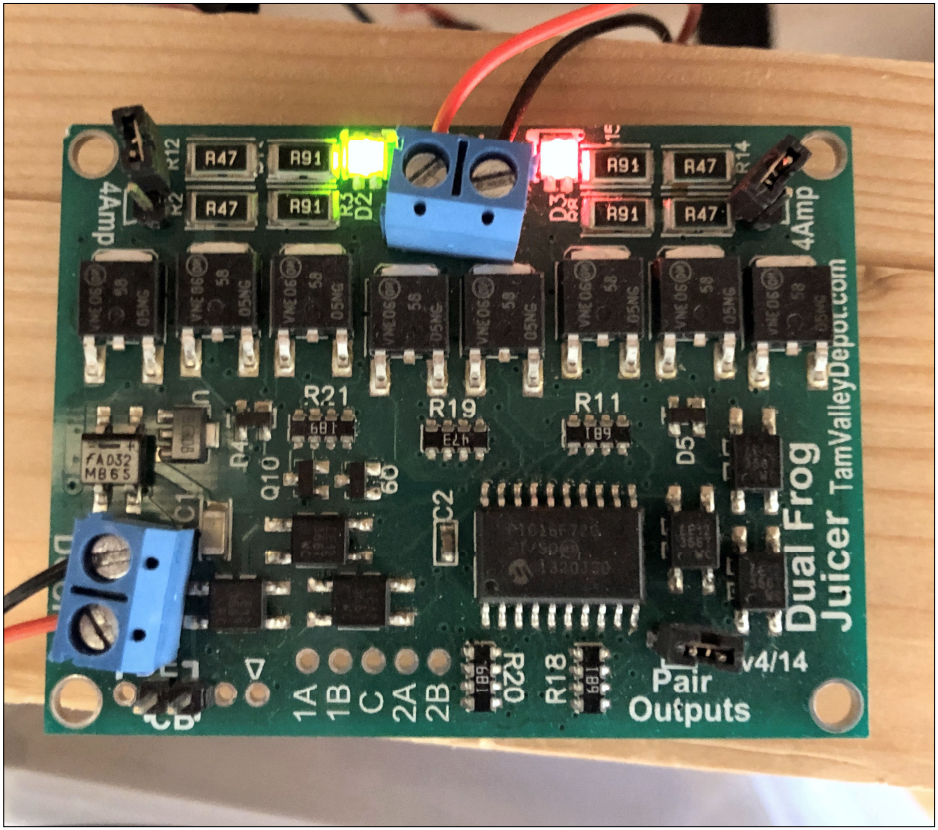
When using live-frog points on a layout, you'll always come across the need to switch the frog polarity as the switch blades are moved. Over the years, various ways of doing that have been developed. The simplest, train-set option has always been to treat the frog and blades as a single electrical entity and to rely on contact between the blades and the stock rails to power the frog. While this works, after a fashion, we all know that this method is fraught with difficulties, not least being that the powering of the frog relies on blade contact which then precludes painting the rails in the contact area. There's also the issue of shorts if a wheel touches both stock rail and the open blade, which also precludes any sort of close-to-scale gap between open blade and stock rail.

Alternatives are based around separating the crossing from the blades electrically with a gap in the closure rails close to the frog and bonding the stock and blade rails together. That eliminates the two issues noted above at a stroke but requires than that the frog power polarity is switched as the blades move. The commonest option for that, when using switchmotors of any sort is to use that motor to operate a switch. Many point motors available have built-in switching - this includes popular slow-mos such as Tortoise and Cobalt, as well as old stager snap-actions like the venerable H&M. Other options available include microswitches operated by the movement of the point mechanism; add-on switches like the Peco one, or for manually operated points, the Blue Point machine which provides Tortoise-like switching for hand-operated turnouts. While all of these do work, and in the case of most commercial offerings, work well, they all are based on a mechanical switch, which as we know, gets dirty, gets out of alignment, or breaks. There's also, in the DCC world, the added issue that if the layout wiring isn't up to scratch, that these switches may be asked to carry large currents for appreciable periods of time should a short occur that the DCC system doesn't catch and break the power. If that happens – noting that on properly wired layouts, it won't - then heat damage, possibly significant heat damage, is likely to occur to the frog switching mechanism, and to the locomotive that causes the short. The likelihood of these issues occurring is magnified by the fact that we all know that the most likely time for them to happen is 10 minutes after opening time on the first day of a two-day show.

But now, for the DCC user, and only the DCC user, there is a viable and simple alternative. That is the Frog Juicer from Tam Valley. These come in Mono, Dual and Hex versions, capable of handling one, two and six point frogs respectively, as well as the Dual and Hex being able to do some other things, too.

When Aylesbury LNWR was being resuscitated, we decided, rapidly, that

because of the state of the wiring we would have to rewire it for DCC to have any real chance of getting it going again, as the old DC control panel was not repairable. We left in place all the existing H&M point motors as they all worked OK, but on some, the switching contacts had failed. So had some of the dubious auxiliary switches that had been used when the layout was built almost fifty years earlier. Rather than mess about with these recalcitrant units we decided it would be far simpler and more reliable to bypass them and switched the relevant frogs with juicers, which worked perfectly, every time.

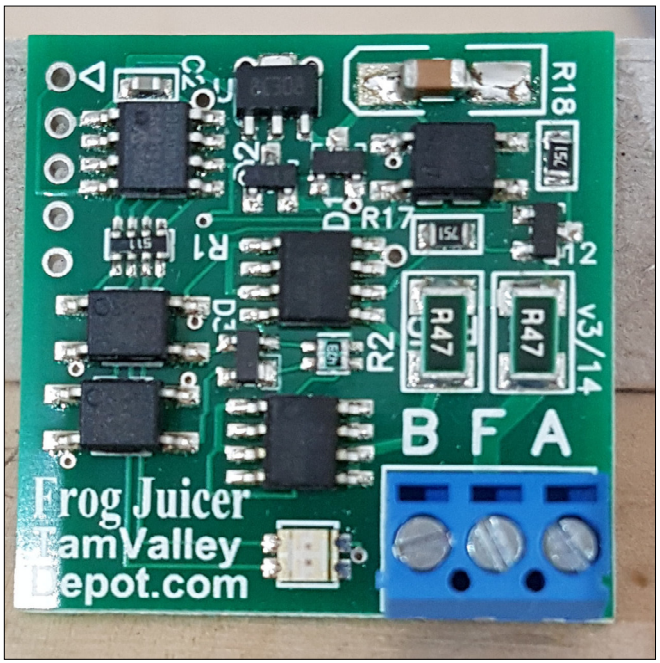


Above: Dual Frog Juicer can be used to switch 2 independent frogs or be used as an auto-reverser. Photo by Mick.

So how do you use these magical things? It's very simple. Each unit is fed the two wires of the DCC track power on one pair of terminals. I should say at this point that all the points in question and the juicer itself do all need to be in the same DCC power district and reiterate that these things are only for DCC users; they do not work with old-fashioned electricity. You then connect the feed

wire from the point frog to the juicer - making sure, as ever, that the frog is isolated from the rest of the turnout. That's all that's required. In use, the frog will be connected to one or the other rail by the device. If it is connected to the "wrong" rail as a locomotive approaches, the device will detect that as the first wheel bridges the two rail ends. It then reverses the DCC polarity of the frog so quickly that neither the locomotive nor the DCC system will see it happen, and you won't have sound locos click, pop or restart. You'll even find that if, as on the prototype, if you approach a point from the heel end across the frog whose blades are set for the other road, the frog will just switch, the loco will carry on and run over the mis-set blades. That might end up with a derailment, but so might that in the prototype!

Beyond simple turnouts, there are more complex frog switching scenarios, where the benefits of automatically switching frogs and crossings on demand are clear. The first example is that of a single slip, where it's not possible to tell what polarity a frog at one end should be from the position of the blades at the other end. Or more complex trackwork configurations like the full outside double slip on Aylesbury LNWR near Park Street crossing - which could also be described as a scissors crossover – it's 4 turnouts and a diamond, and some of the old switches for that had failed. It's way simpler to switch the frogs in such arrangements with a juicer than it is to mess around with ganged mechanical switches or relay cascades, and of course far simpler to install and get working. Even a plain diamond crossing can be hard to do with mechanical switches if the approach routes themselves use multiple points, or have no points close by, or the two routes have nothing in common. Switching the crossings of such a diamond becomes again straightforward with a juicer.



Left: mono Frog Juicer. A & B are track connections, F is the frog connection.

Photo by Paul.

The TV Dual juicer can also be used as an auto-reverser, merely by configuring a single jumper. When set up like this, as well as operating a balloon loop, it will also reverse the polarity of the rails on a turntable on demand. I use one this way on a turntable on my own layout. Previously it was powered in a conventional way with a commutator-type arrangement below the baseboard made of PCB with wipers on it, but that just wasn't always reliable. The pivot is a brass tube, so I reworked it with two separate lands on it, each connected to one rail on the deck, then connected the pickup tabs to a Juicer configured to autoreverse. All the reliability issues I'd previously been having just vanished. The picture on page 13, shows the juicer in action below the turntable. You can see the DCC power coming in on the left and the outputs at the top. Bottom right is the jumper that pairs the two outputs together. It's required to be on for the usage I'm making or left off to power two separate point frogs. The two LEDS change colour when the device switches, so that on installation and testing you can see that it is working.

These things certainly add cost to each turnout. SCC, run by club member Ted Smale, stock Tam Valley products and Ted will give you current prices if you ask (01865 730455). Late 2019 UK street prices seem to be about £13 for a Mono, £30ish for Duals and around £70 for a Hex. Duals are more expensive because they feature higher powered internals capable of handling 10 amps of draw; the Mono and Hex are Ok for the 5 or 8 amp boosters you're more likely to meet powering layouts up to and including O-scale. But put those prices in context. If your point is powered by a £2 servo, adding £13 or so for a share of a Juicer gives a total price that isn't much different to that of a Tortoise motor, which will do the same job with mechanical switches. What's the price, especially on an exhibition layout, of the peace of mind that you get knowing that there is nothing mechanical that can go wrong?

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