Some background on the club's upgrade to a DCS 240 and the associated problems.

Or LONG_ACK: Switch request failed!

By Bill Deeter

After the January 2025 open house, the HO group upgraded from a Digitrax DCS100 to a Digitrax DCS240 after running the DCS100 for many years. We have used the same JMRI panel (with minor updates along the way) with no problems, except for a slot max (100 locos) issue with the DCS100 now and then. The DCS240 was new Technology that the club acquired for an excellent price several years prior, allowing for 400 slots (400 locos). Even though it was newer technology than we had, it was already outdated.

Anyway, we had the DCS240, but it hadn't been tested yet, so after the January 2025 open house, I started the installation and testing process. At the first OPS session, we seemed to have a lot of control issues and MU losses. So I tried a firmware update, as it did not have the latest firmware. I hoped that would solve the problems. Believe it or not, it bricked during the update, so it went to FL for a vacation. Not wanting to wait, I got a new DCS240+ that came with outdated firmware. I did the firmware update and connected it to the layout. We still had the same control and MU issues. Of note, we were mixing legacy and new extended throttles, which were probably at least part of the MU issues. Also, most of the DT602s and UT6s needed their firmware updated. I have a ticket open with Digitrax on the MU issues (waiting for developer (AJ's) testing). So we banned all legacy throttles from the layout, but we were still having control and MU issues at OPS sessions. For the MU problem, we also learned that most of the new throttles were operating in "legacy" mode. So most new six-series throttles were in the 100 slot mode and need their options changed to "Extended". I do not have enough data on the MU issues at this point, so let's not get in the weeds on MU, as I really needed to solve the loss-of-control problem first. So with much back and forth, I thought it may be a radio problem. We had a mix of wireless technology, an ancient UR92, and a newer UR93, which, for some reason, I had suspicions that the UR93 was not working correctly. The other reason for thinking it was a wireless problem was the fact that after a loss of control issue, plugging in seemed to improve the control issue at least.

After over eight months of chasing it, swapping command stations back and forth, and replacing the UR93 and adding a new UR93 (the new one needed its firmware updated). I was starting to get the idea that it was something to do with the Loconet. So after going down several rabbit holes with no luck, I started looking at the Loconet Monitor more closely (yeah, I should have looked at it more closely from the beginning). It showed many Long_ACK Fail errors. On October 15th, I finally had proof. I had the Loconet Monitor running, and the dispatcher ran the route reset from OPS to Open House mode. The folks running wirelessly lost control but could plug in and regain control. There were many Long_ACK Switch Request Failures. I mean a lot! Once the route finished running, wireless control was restored. It took several minutes longer than the route should usually take, with all the Long_ACK Switch Request Fails! Apparently, a plugged-in throttle gets higher priority than the wireless to interrupt the string of Long_ACK Fails. However, due to Long_ACK errors, the panel did not fully set up, with some signals dark and misaligned turnouts. It took at least three runs of the route reset to get the layout right.

So now I had a repeatable failure. What I learned in troubleshooting was that if the track power was cycled, it would get stuck in a continuous Long_ACK Fail loop. This happened with both the DCS240 and the DCS240+, but the DCS100 worked fine. The only way to get it out of the loop started by cycling track power was to power down the layout completely. With the DCS240+ and a separate JMRI Loconet monitor (one without the panel

running), I could cycle track power without any Long_ACK failures. So it seemed to me that it was a JMRI problem communicating with the DCS240+. Something was different with how JMRI and the DCS240+ communicated. I searched for "Long_ACK Fails" and found some posts in the JMRI & Digitrax groups.io, but nothing was a solid fix. So, I posted a question myself. If you follow JMRI's IO group, here is the message: https://groups.io/g/jmriusers/message/246611
From past experience and some previously posted messages, I suspected that Digitrax's "Bushby Bit" was a possibility. So someone I consider a long-time expert on both JMRI and Digitrax said, in answer to my question about the Bushby Bit, "Does not accomplish anything." So, I went along with the suggested help info from JMRI https://www.jmri.org/help/en/html/hardware/loconet/Digitrax.shtml#TurnoutCmdHandling

Well, it is pretty extensive, and I tried a lot of the suggested ideas in different combos, but nothing seemed to help. Some were even worse. In some cases (well, most), you have to manually change the Mode and Raw in the Turnout Table for all turnouts on the layout, including the signal heads. So I started the process around 2 pm on Saturday, October 18, 2025. Somewhere late that evening, I had had enough fun and decided to try the Bushby bit even though it supposedly did nothing. The command station default for the Bushby Bit OPSW 27 is "T", so it is changed in the command station by changing OPSW 27 to "C". The DCS240+ manual says that changing to "C" disables normal switch commands, but I didn't think much about it, so I tried it.

Lo and behold, that stopped the Long_ACK error, and the routes and signals seemed to be working correctly, and the power cycle had no effect. So that was a fun 10-hour day. I tested that the turnouts still threw with the local toggles, and they did. I did not think to test if the throttles could throw the turnouts. After I got home, I was reading Digitrax Help on the "Bushby Bit," and it says that setting OPSW 27 to "C" takes control away from the individual throttles to throw switches. That had me a bit concerned, as we use the throttles to throw a few turnouts. Well, that article was written in 2012, and it seems the new code in the DCS240s acts differently. When I returned to the club to test the throttles, they threw the turnouts connected to our DS64s and SE8Cs. They all have separate power supplies; none are track-powered. I have since also tested this with both the DCS240 and the DCS240+, and all works as it should

Part of our layout shutdown is to turn off the track power. So my theory on losing some MU's after track power is turned off has to do with the Long-ACK loop (Buffer Full) error, and probably not saving the MU info correctly. Only some test time will answer if that was the case, but so far it seems to be remembering the MU's.

I still do not have an answer on how to use the Legacy throttles and the expanded throttles to select MU's made in expanded slots and chosen with a legacy throttle. I have heard nothing from my ticket at Digitrax and have not had time to test further myself. I may test further in 2026, but for now, we are not allowing the use of "legacy" throttles. This also means personal throttles need to be set to "expanded" mode as well.