At the Repair Bench – Heathkit® HD-1234 – July 2022

The typical ham wouldn't usually think of an antenna coax switch as being a repairable item, but sometimes it is — especially when the name *"Heathkit®"* is involved. I recently encountered a six-position (four live connections) switch, a Heathkit® HD-1234, that had two dead positions. Its owner had added another antenna, and so needed to use an additional position on the switch. Of course, I decided to give it a shot.

This unit has a six-position switch mechanism which connects each of the four live connectors to a common connector in turn as the switch is rotated. The device is of a hexagonal shape, with a standard SO-239 connector on each of five of the sides, and a ground post on the sixth side. The way the unit is designed, when a given position is selected, all of the other positions' connectors are grounded. The connectors are labeled "1" through "4", "C", and "G". The internal switching mechanism has no physical stop, which means that it can be rotated a full 360° if so desired.

The complaint was that positions "3" and "4" were defunct, with no connection to the common connector *or* to ground when selected. At first, it seemed like a straight-forward open circuit problem, such as a broken solder joint at each of the non-working connectors. Close examination, however, showed that all of the solder joints were intact. On the off chance that there were hidden defects there, I went ahead and reflowed the solder on all of the connectors, but to no avail. The problem still existed.

I decided that the problem had to be inside the switch itself, so I disassembled the unit, de-soldering all of the connectors from the switch. The switch is a double-sided rotary switch on a ceramic substrate, with a contact disc on either side of the ceramic base, and a fixed brush at each of the connector positions. In its assembled condition, only the ground side of the switch substrate or base is visible; the detent plate at the top conceals the upper active connection disc and brushes. This meant that I would need to disassemble the switch to get at the upper contact disc. No problem — it is held together by a pair of machine screws with spacers, washers, and nuts.

Once the switch was apart, I began to investigate just why there was no continuity at those two switch positions. What I found was a bit of a surprise. The whole problem was a heavy build-up of oxidation on the brush contacts at those two positions. The fix was fairly simple —some cotton swabs, a toothbrush, and some DeoxIT® Gold. Twenty minutes of cleaning on both sides of the ceramic disc, and the switch contacts were operational again. Another ten minutes, and the switch was reassembled and ready to go back into the unit, with a fresh application of DeoxIT® X10S on the shaft and bushing to aid in long-life operation.

I cleaned up all of the parts, including wire-brushing the threads on the SO-239 connectors. Then I re-assembled the entire unit, and soldered the connectors to the switch terminals. Testing with an ohmmeter showed good clean continuity and zero resistance through all positions of the switch. Passing 30 VDC through the switch from common to each output in turn showed zero voltage drop internally in the switch.

So… what happened here? Why did only two of the switch positions have this heavy oxidation? As it turns out, the owner has had this switch in service for over thirty-five years, but he has never used anything but switch positions "1" and "2", and never turned the switch all of the way around the dial — he

simply switched it back and forth between the two positions he used. This led to a lack of “scrubbing” at the unused positions, and age and time took over from there.

Moral of the story? Sometimes, it pays to take the long way around. Exercising the switch through its entire range of travel from time to time will help to keep the contacts clean and oxidation free, allowing the switch to perform up to its design specifications. See you next month!