

Drake R8: Encoder Shaft "Static" Elimination

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In his RDI white paper, Edition 2.0, review of the R8, Magne referred obliquely to the R8 encoder shaft static problem as follows. "If it wasn't grounded, the receiver might emit static sounds when the tuning knob was adjusted to a certain position -- hardly what you'd hope for in a fidelity-oriented receiver. However, most units manufactured in 1991, and all units manufactured since early January, 1992, have been upgraded to eliminate the need for grounding."

My R8 was purchased in July 1992, so presumably it was manufactured after January 1992. Yet my R8 had the static problem. Grounding my R8 reduced the intensity of the static, but did not eliminate the static. Assuming that somehow my R8 was not correctly manufactured, I returned it to Drake in September 1992 to have them fix the static problem and to do some other warranty work. I got my R8 back in exactly the same condition regarding the static with the following notations on the warranty work sheet. "Unit has new type encoder. No noises noted."

They were helpful enough to provide me with a clue as to the cause of the static, namely the encoder. So I removed the main tuning knob from the encoder shaft and fiddled with the shaft. Sure enough, by wiggling and rotating the shaft I could generate the "static" to my heart's content. Here perhaps I should add that the static is not observed without an antenna connected and the R8 tuned to a relatively weak signal with little background noise. Anyway, while I was fiddling with the encoder shaft I was reminded of a similar problem I had with my 2 foot air core amplified loop. About a year after I built my loop it started emitting static as the tuning knob was rotated. The cause of my loop static problem was traced to the two speed shaft of my Jackson Brother's planetary drive: it was not grounded properly. The JB shaft is heavily lubricated, and thus partially isolated from ground, depending on whether the shaft and/or bearings make good contact with the case. Since the shaft was attached to the main tuning capacitor (which was floated from ground because the loop is balanced) through a flexible insulated coupler, the JB shaft did not have a good ground. The solution there was to ground the JB shaft through a tension loaded ground contact (a thin automotive feeler gauge bolted to ground). I quickly verified that a similar solution worked for the R8. The R8 encoder shaft was not properly grounded!

Unfortunately, there is not enough space between the main tuning knob and encoder shaft bushing to install an automotive feeler gauge ground like I did for my loop. Then I was reminded of the 51J-4 KCS shaft tension washer assembly (clearly Collins didn't permit their PTO shaft to emit static). After considerable digging through my junk boxes I found two thin flat washers with 1/4 inch inside diameters, and an extremely thin bronze spacer (apparently from an R-390A RF deck gear shaft) which could be easily bent into a tension washer shape (convex). The 51J-4 tension washers have way too much tension and give the R8 tuning a definitely sluggish feel. You want to use a tension washer with as little tension as possible while maintaining a good electrical ground. With the tension washer sandwiched between the two thin flat washers, and the main tuning knob installed carefully to minimize tension, the encoder "static" was completely eliminated and the R8 tuning "feel" remained original.