



improving the Drake R-4C product detector

The single-ended diode product detector used by Drake is typical of the type designed into many present-day receivers. Its simplicity and small number of parts make it a good performer in the Drake R-4C receiver.

However, the 1N270 diode used in this circuit creates large harmonic currents because of its nonlinear nature. This harmonic energy is generated by the BFO and appears as a constant hissing sound in the audio output. It's not noticeable on fairly strong signals but can become annoying if you're listening to a weak signal.

Some time ago I replaced the PN diodes in another receiver with hot-carrier diodes and noted an improvement in performance. Hot-carrier diodes differ from the usual PN diodes in that they switch very fast and don't suffer from the charge storage effect of the junction diode, which creates the high order of harmonics appearing in the audio output.

I replaced the 1N270 diodes in my R-4C with Hewlett-Packard HP5082/2800 hot-carrier diodes (fig. 1). The results were quite pleasing. Although the hiss was not completely eliminated, it was significantly reduced. The audio output level also increased.

A word of caution in replacing the 1N270 diodes: They're difficult to remove from the PC board because they are on the bottom of the board,

which is mounted in a vertical position with other parts around it. A little extra care and a small pencil-type soldering iron should do it. Before re-

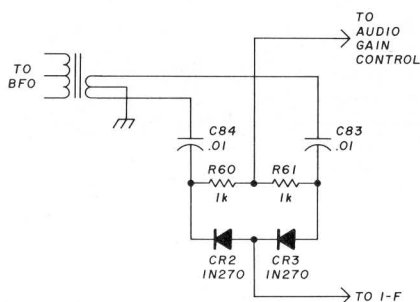


fig. 1. Diodes CR2, CR3 in the Drake R-4 receiver were replaced with H-P 5802/2800 hot-carrier diodes to reduce product-detector noise.

placing, note the polarity of the removed diodes.

The HP5082/2800 diodes are very small and have a glass body. They crack easily if the leads are pulled too tightly through the holes in the PC board.

If the HP5082/2800 diodes are difficult to obtain, a suitable replacement is the Sylvania ECG519.

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