

Huff Puff Stabilizer for the Drake TR7 or TR7A transceiver.

This circuit is based on the stabilizer by PA0KSB. I have made some modifications and additions to make the circuit suitable for the Drake TR7.

Read for the full explanation of the stabilizer the original publication in English QEX Feb. 96 or in Dutch Electron Dec. 96 and Jan. 97

Description:

I have used the 40MHz crystal oscillator that is already built in the TR7 as reference for the stabilizer circuit. A buffer amplifier BF494 amplifies the signal to a level high enough to drive the digital mixer 74HC74.

The PTO output (as the VFO is called by Drake) is amplified to drive the binary counter 74HC4060.

The Drake PTO has already a RIT input line that is connected to a varicap diode inside the PTO. This same line can also be used for the stabilizer.

The RIT control line and the output of the integrator CA3140 are added together in the summing amplifier NE5534 and go the original RIT input of the PTO.

I have added a reset circuit to the original design. When the TR7 is switched on, the output of the integrator is always set to the midrange value of 4V. A manual reset input is also available. When the reset input is made high (+2..+10V) the integrator will also reset to mid range. So far I have not connected this manual reset line, because the total drift was never large enough to reach the limits.

Two comparators LM258 measure the output of the integrator. If the voltage comes within .5V of the upper or lower limit the LED lights up.

Optional the output of the comparators can be connected to the reset circuit. However if this auto reset takes place the PTO will jump from its set frequency. This may not always be desired.

Construction:

The stabilizer was constructed on a 75x75 mm piece of perforated experimenter board. All components are at one side while at the other side all connections were made with thin bare wire and isolated wrap wire where needed. There is no printed circuit board available. My layout can be used as a guideline to other design.

The board is mounted under the parent board of the TR7 (see photos). At one side the board is mounted with a 5mm spacer, using an existing screw position in the parent board. The original screw was replaced by a longer one to hold the board.

At the other side of the board an isolated 5mm stand off prevents the board from touching the parent board. At the inside of the bottom cover. I have glued a plastic isolation sheet to prevent the board touching the bottom cover.

All connections between the TR7 and the stabilizer are directly to the parent board, only one wire has to be removed from the parent board and extended to the stabilizer board.

A 100pF capacitor is mounted directly between the connection point of the PTO to the parent board and the coaxial cable. This to minimize the capacitive loading of the PTO by the cable.

Adjustment:

After completion the RIT center position has to be readjusted.

Hold the reset line high. Exactly center the RIT control on the TR7 front. Switch the calibrator on. Switch PBT on. Center the PBT control. Switch the RIT on.

Tune the receiver to exactly zero beat to one of calibrator points. Switch the RIT off.

Adjust R24 on the parent board exactly zero to beat. (R24 can be reached through the small access hole in the parent board just above the stabilizer board on the photo.)

Results:

Without the stabilizer my TR7 drifted after switch on over about 500Hz in 5 hours. With the stabilizer build in, no drift took place. The locking points appear to be about 20Hz apart.

Rien, PA0TRT

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