



T700 Simplex Low Current ON & OFF Timer Operation

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General

This document is intended to help in understanding the operation of ON/OFF timer in the T700 simplex low current radios. In particular the ON timer whose operation is not obvious, and is not explained by the help screen.

The T700 simplex low current radio is on that is modified as per the T700-65-00X fitting instruction, fitted with firmware version 3.20, and programmed with software version 3.07.

In low current mode the radio switches the power to the radios RF and audio stages, on and off, at a controlled rate.

Thus, when the equipment is installed as part of a infrequently used link, the average current will be lower than that of a normal radio. The reduction in average current will depend upon the usage, and the programmed ON / OFF times.

For maximum current saving, the ON time should be keep short and the OFF time kept long. Having a long OFF time will cause delays and possible loss of the first part of a message. The OFF time should therefore be chosen for the best compromise between delayed operation and current saving.

The ON timer is more sophisticated, its operation is explained below.

Consider a radio with two channels, a CTCSS controlled channel and a carrier controlled channel.

When the carrier controlled channel is selected, the time entered into the ON time field is ignored, and the default value of 150 mS is used. This value has been chosen to ensure that the radio always has sufficient time to reliably detect the carrier. A smaller value may cause the radio to sometimes fail to detect the carrier and come out of low current mode, while a larger value does no more than waste current.

When a CTCSS controlled channel is selected, the whole operation is somewhat more complex.

Consider the situation where no signal is present, here the radio operates with the default value of (150mS) as mentioned above. If a carrier is applied (with no CTCSS or an incorrect CTCSS) the radio will, upon detecting the carrier, switch on for the pre programmed ON timer value.

While this timer is running the radio attempts to decode the CTCSS. If decode is successful the radio will open up and the timer will be cancelled until the CTCSS tone becomes invalid again. If CTCSS is not detected the radio will revert back to cycling mode with the programmed ON value until the carrier is removed, at which time the radio will revert again to an ON time of 150mS.

This algorithm is there to ensure that the radio will, whenever possible, have a minimum amount of time in the ON condition, thus keeping the current drain to a minimum.

The value that should be programmed into the ON timer field will depend upon the frequency of the CTCSS tone being decoded.

Typical values might be:

250.3 Hz = 150 mS
 156.7 Hz = 200 mS
 100.0 Hz = 250 mS

Truth table for the "ON & OFF" Timers on Channels Programmed with CTCSS.		
Condition	ON time	OFF time
No Carrier or CTCSS	150mS	As programmed
Carrier with no CTCSS or invalid CTCSS	Programmed ON value	As programmed
Carrier with valid CTCSS	Permanent	N/A

Truth table for the "ON & OFF" Timers on Channels Programmed without CTCSS.		
Condition	ON time	OFF time
No carrier	150mS	As programmed
Carrier with or without CTCSS	Permanent	N/A