

Re: *Timex M850 Speed + Distance GPS Transceiver – Class 2 Permissive Change*
Subj: *Description of product changes to transmitter circuitry*
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Prepared by:

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Original Circuit Design: used a clock of 5.5MHz divided by 39 and 40 to give transmission frequencies of 141.0256kHz and 137.500kHz. Data is transmitted at 1024 baud by switching between frequencies for a 1 or 0 (0 is 141.0256kHz). Transmission is only on when data is transmitted, about 80 ms every 3.57 seconds. The resonant current in the tuned LC oscillator circuit generates enough magnetic field in the inductors ferrite rod to allow reception by a watch, up to 1 meter away. Any shift in resonant frequency, of the LC circuit, will cause transmission power to drop.

New Circuit Design: uses the main 16.3676 MHz clock, divided by 116 and 119, to give transmission frequencies of 141.100kHz and 137.543kHz. Data transmission is at the same 1024 baud rate to stay compatible with existing watches. In order to reduce a drop in transmission power with changes in LC resonant frequency, due to component tolerance and drift, an AGC type circuit has been introduced which maintains the resonant current in the LC circuit across a +/- 5kHz shift in resonant frequency thus maintaining magnetic field strength across this range. Outside this range the transmission power reduces.

Additional changes:

Clock: 16.3676 MHz, doubled in the Base-Band DSP, used internally only.

Power Supply: Boost converter switching frequency 500 kHz (tolerance range 420-780 kHz)