

## ***Interactive comment on “Multifunction waveform generator for EM receiver testing” by Kai Chen et al.***

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The paper introduces the design and the testing of a customized multi-function waveform generator for the testing of an EM receiver. There are very few literatures considering this problem although many EM instrument owns build-in waveform generator for testing. I suggest the publishing of the manuscript if the following suggestions are considered by authors .

1. This manuscript lacks essential references considering the testings of EM receiver. There are papers and patents in English and Chinese considering this problems. This problems is attacked by many Chinese authors. I just list a few of works by myself here. Ruijie Shen, Kailin Qiu, Hongchun Yao, Zhanxiang He, Xianghong Lu, Rujun Chen:

C1

The design and realization of the signal generator for the calibration of MT instrument based on FPGA and GPS synchronization (in Chinese with English abstract). DOI:10.11720/wtyht.2013.1.15

Hongchun Yao, Rujun Chen, Shengli Liu: Development of automatic test software for multi-frequency IP receiver based on the Ethernet (in Chinese with English Abstract). Wutan Huatan Jisuan Jishu 03/2010; 32:211-216.

Rujun Chen, He Zhangxiang, Qiu Jieting, He Lanfang, Cai Zixing: Distributed data acquisition unit based on GPS and ZigBee for electromagnetic exploration. Conference Record - IEEE Instrumentation and Measurement Technology Conference 01/2010; DOI:10.1109/IMTC.2010.5488223

He Zhanxiang, Chen Rujun, Liu Xuejun, He Lanfang: Magnetotelluric instrument performance evaluation method. Ref. No: CN200910237810, Year: 05/2011

Chen Rujun, Yao Hongchun, Liu Shengli: Automatic testing system of pseudo-random multi-frequency instrument receiver. Ref. No: CN200910044457, Year: 03/2010

Chen Rujun, Luo Weibing, He Jishan, Yan Liang, Liu Shi: Multi-functional transmitter and controller for electrical surveying signal. Ref. No: CN200610032163, Year: 02/2007

2. The authors should summary the works by other peoples in the subject studied by the authors.

3. In line 10 - line 11, the time synchronization of waveform generator is not needed for the testing of EM receiver (AMT, MT, CSAMT, SIP, etc.). The time sync is only needed for transmitter, receiver, and calibration. We measure E/H or voltage/current at the same time. This process doesn't need precise sync of input signal. Commercial waveform generator is OK for the testing of EM receiver.

4. In line 41, simple introduction of EMR6 is needed.

C2

5. In line 151, specification of RTC is needed.
6. Section 3.1, exact types of MCU and CPLD are needed.
7. Line 171, What's the meaning of COMS?
8. Line 173, AMY may be AMT.
9. Line 181-185, it's not clear about the process of testing using GPS time.
10. Line 201-203, it seems no stop time in frequency switching. MCU needs time to control CPLD and CPLD needs time to sync and response. What's the communication method between CPLD and MCU?
11. THD is a vital factor determining the performance of EM receiver. Just like seismic instrument, THD testing is vital important. The authors don't consider this problem in the testing of EM receiver.

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