Sanity Check

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July 2020

1 Introduction

The Traumschreiber board 02 (external reference) and board 03 (internal reference) are tested with a function generator as a sanity check. Tested were 5 and 50 Hz Sinus with 50 and 100 mV. For board 02 all six channels were tested, for board 03 only channel 1.
!Important!: There is a difference in channel naming between the board and the app, whereas the board starts with channel 0 and the app with channel 1. In this document the App naming is used (Ch-1 to Ch-6).

2 Setup

Subject ground and active ground are connected to ground of signal generator. Signal is injected into the channel in question.

2.1 Devices

Function Generator: **Missing**
Oscilloscope: **Missing**
Traumschreiber: Version 2.8 (?) (board 2 and 3)
The signal is recorded with the current EEGDroid version (18.07.2020) on a Android mobile phone (Honor 9).

3 Experiment Overview

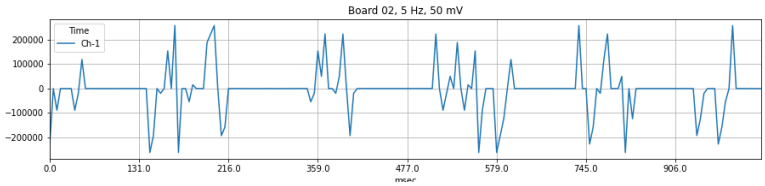
Two different boards were tested with various frequency and voltage combinations. All recordings can be found at the project's GitHub.

Table 1: Most of the time the Traumschreiber had to be charged via USB while the test was conducted. If it run solely on battery this is noted in *Battery*. If the experiment number contains a .1 it usually means that the recording stopped unexpectedly and the measurement had to be started again.

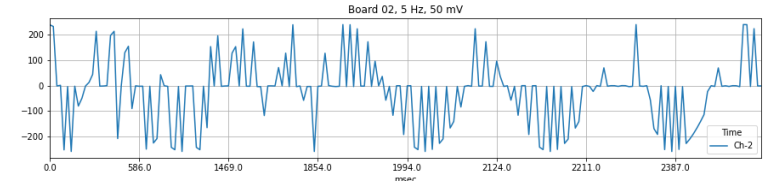
Exp. Number	**Board**	**Frequency**	**Voltage**	**Channel**	**Battery**
1.1	02	5 Hz	50 mV	1	
2	02	5 Hz	50 mV	2	
3	02	5 Hz	50 mV	3	
4.1	02	5 Hz	50 mV	4	
5	02	5 Hz	50 mV	5	
6	02	5 Hz	50 mV	6	
7	02	5 Hz	100 mV	1	
8	02	5 Hz	100 mV	2	
9	02	5 Hz	100 mV	3	
10	02	5 Hz	100 mV	4	
11	02	5 Hz	100 mV	5	
12	02	5 Hz	100 mV	6	
13	02	40 Hz	100 mV	1	
14	02	40 Hz	100 mV	2	
15	02	40 Hz	100 mV	3	
16	02	40 Hz	100 mV	4	
17	02	40 Hz	100 mV	5	
18	02	40 Hz	100 mV	6	
19	02	40 Hz	50 mV	1	
20	02	40 Hz	50 mV	2	
21	02	40 Hz	50 mV	3	
22	02	40 Hz	50 mV	4	
23	02	40 Hz	50 mV	5	
24	02	40 Hz	50 mV	6	
25	03	5 Hz	50 mV	1	Yes
26	03	5 Hz	50 mV	1	No
27	03	40 Hz	50 mV	1	Yes
28	03	40 Hz	100 mV	1	Yes
29	03	5 Hz	100 mV	1	Yes
30					
31	02	5 Hz	50 mV	2	Yes
32	02	5 Hz	100 mV	2	Yes
32	Did	not	work		

4 Results

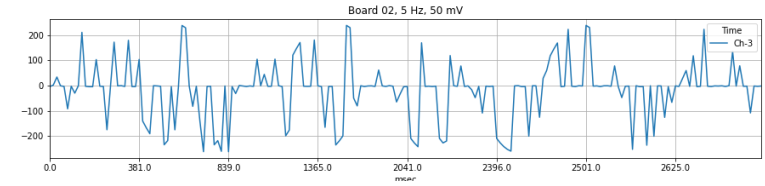
The following is a collection of all plots. For other settings (e.g longer/other periods, please visit the GitHub and plot them yourself. Note that these plots display the first 200 measurements. Therefore the displayed time interval varies strongly between the plots. A next step has to be to find out why the difference is so big.



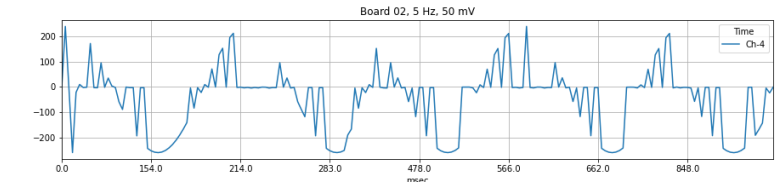
(a) Experiment 1, Channel 1



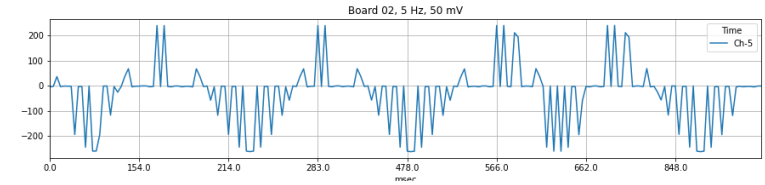
(b) Experiment 2, Channel 2



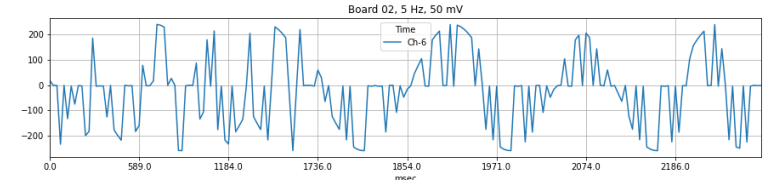
(c) Experiment 3, Channel 3



(d) Experiment 4, Channel 4

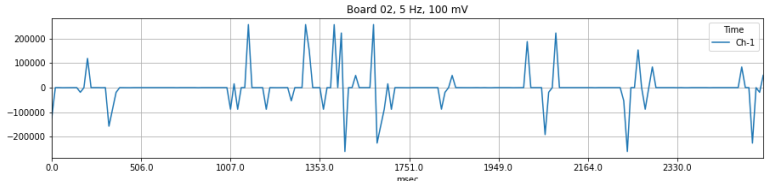


(e) Experiment 5, Channel 5

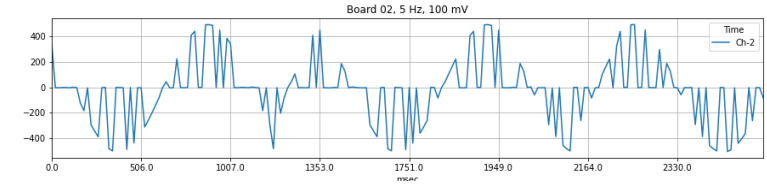


(f) Experiment 6, Channel 6

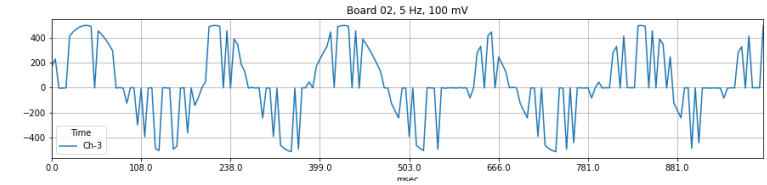
Figure 1: Experiments 1-6: Board 02, 5 Hz Frequency, 50 mV Voltage, Different Channels, Charged via USB



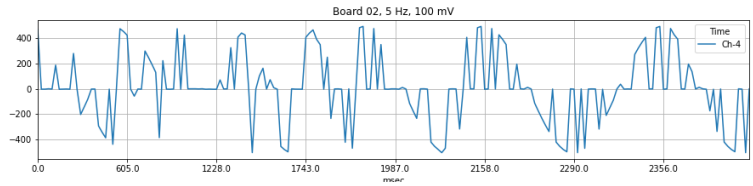
(a) Experiment 7, Channel 1



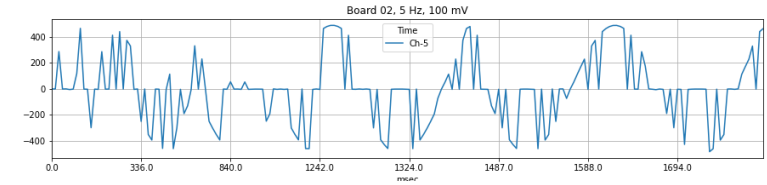
(b) Experiment 8, Channel 2



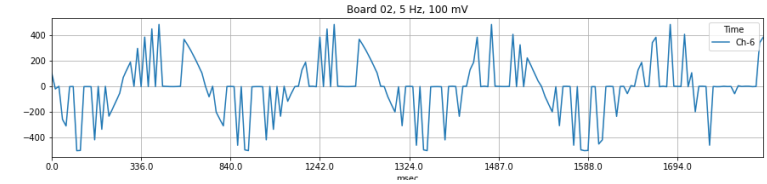
(c) Experiment 9, Channel 3



(d) Experiment 10, Channel 4

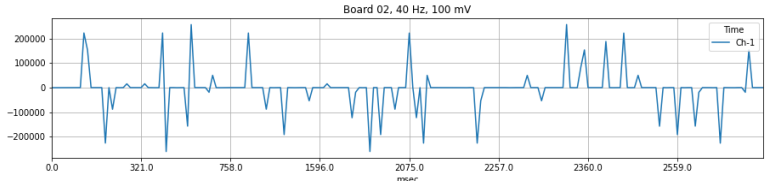


(e) Experiment 11, Channel 5

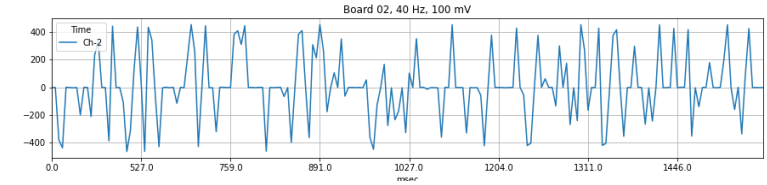


(f) Experiment 12, Channel 6

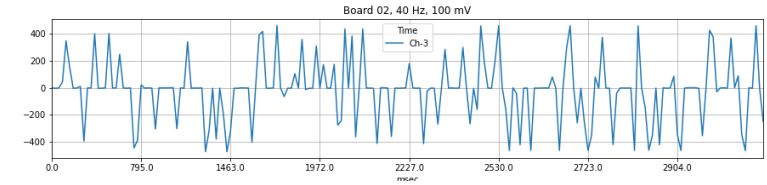
Figure 2: Experiments 7-12: Board 02, 5 Hz Frequency, 100 mV Voltage, Different Channels, Charged via USB



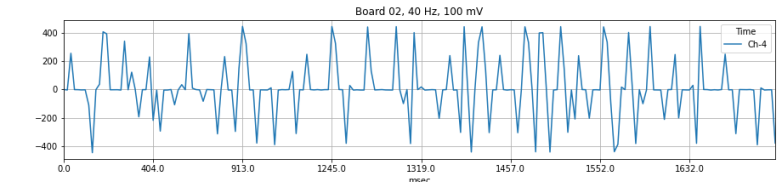
(a) Experiment 13, Channel 1



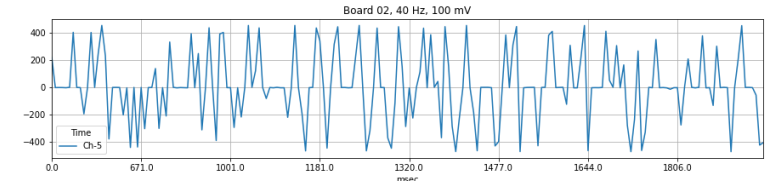
(b) Experiment 14, Channel 2



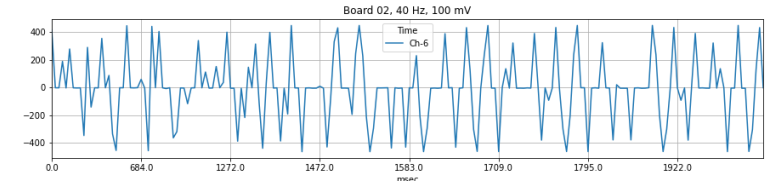
(c) Experiment 15, Channel 3



(d) Experiment 16, Channel 4

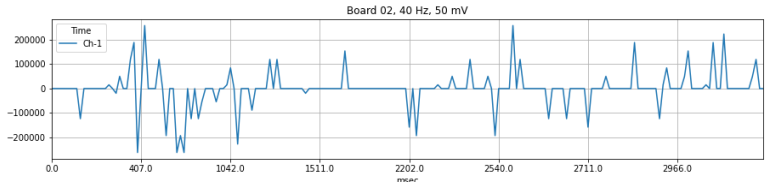


(e) Experiment 17, Channel 5

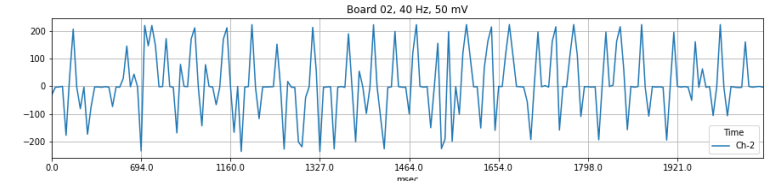


(f) Experiment 18, Channel 6

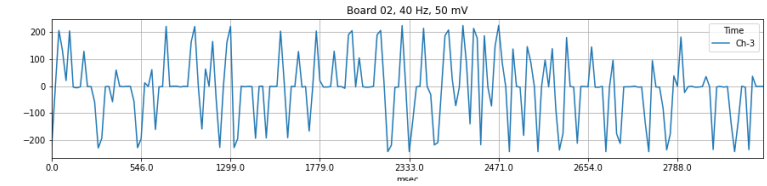
Figure 3: Experiments 13-18: Board 02, 40 Hz Frequency, 100 mV Voltage, Different Channels, Charged via USB



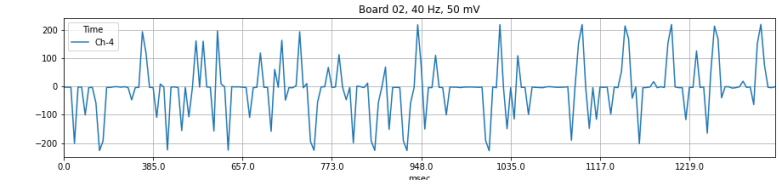
(a) Experiment 19, Channel 1



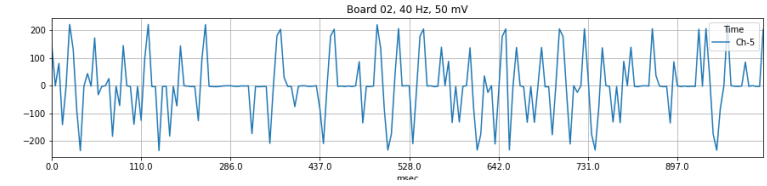
(b) Experiment 20, Channel 2



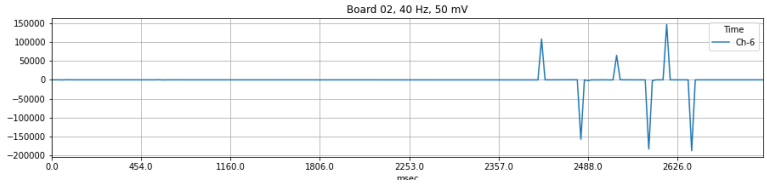
(c) Experiment 21, Channel 3



(d) Experiment 22, Channel 4

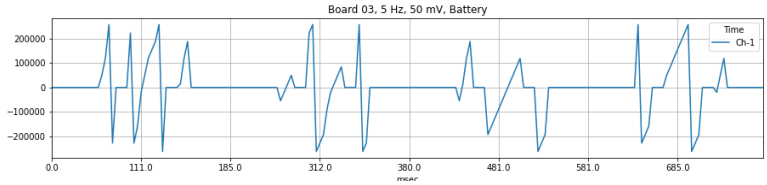


(e) Experiment 23, Channel 5

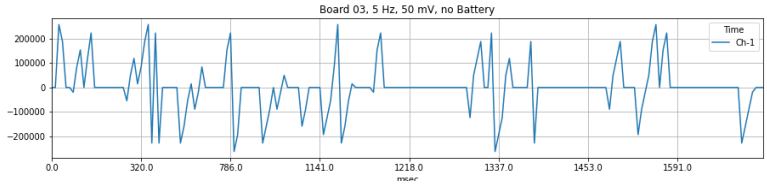


(f) Experiment 24, Channel 6

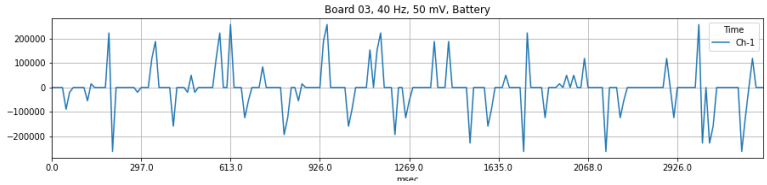
Figure 4: Experiments 19-24: Board 02, 40 Hz Frequency, 50 mV Voltage, Different Channels, Charged via USB



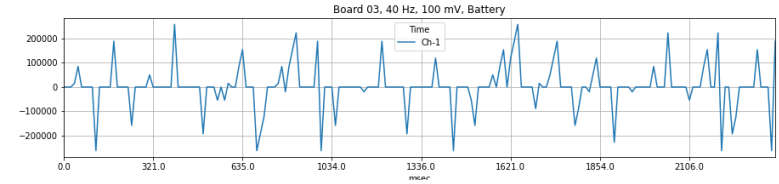
(a) Experiment 25, Channel 1



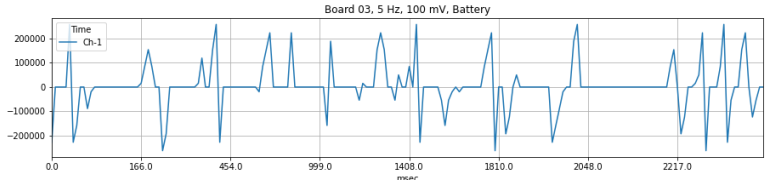
(b) Experiment 26, Channel 1



(c) Experiment 27, Channel 1

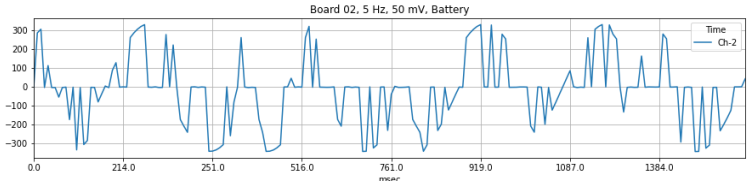


(d) Experiment 28, Channel 1

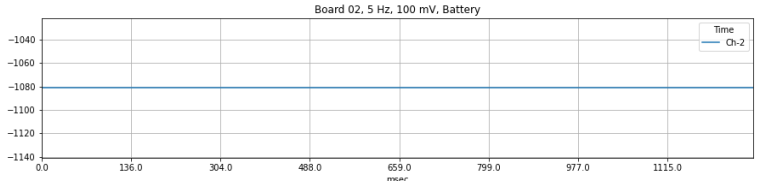


(e) Experiment 29, Channel 1

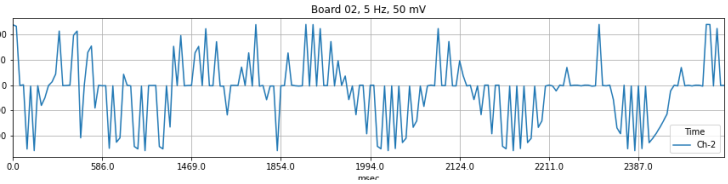
Figure 5: Experiments 25-30: Board 03 (Internal Reference), Different Frequencies and Voltages, Channel 1



(a) Experiment 31, Channel 2. With Battery



(b) Experiment 32, Channel 2 - Did not record, do not know why at the moment



(c) Experiment 2, Channel 2, Charged via USB, same settings otherwise

Figure 6: Experiments 31 and 32 in comparison with Experiment 2 (same settings but charged with USB during recording) 5 Hz, 50 mV, Channel 2