

# Benchmarking

between

“SOTA MPG5” and ”PARAPULSER”

Date of benchmarking : 27. January 2011  
Equipment used for benchmarking : - Tektronix Digital Storage Oscilloscope  
Type “TPS2024” (200MHz/ 2 GS/s)  
- Teslameter from Projekt Elektronik GmbH, Berlin  
Type “FM210” (analog output with 35kHz bandwidth)  
Benchmarking done by : Mr. Dipl.-Ing. (FH) Alexander Mikas,  
Mikas Elektronik Entwicklungen, Germany

Measurements	SOTA MPG-5	PARAPULSER
Pulse frequency in [Hz]	0,2315	3,00
Maximum magnetic flux density in [Tesla] (Gauss)	0,632 (6320)	0,664 (6640)
Rise time of magnetic pulse in [Microseconds]	953	469
Fall time of magnetic pulse in [Microseconds]	4532	512

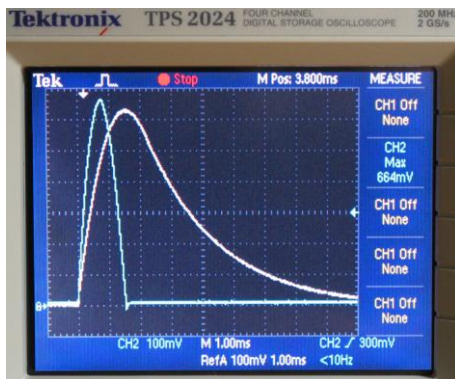
If the SOTA MPG5 measurement results are taken as reference, then the PARAPULSER outperforms the SOTA MPG5 in each measurement by the following factor:

Pulse frequency :  $3,00/0,2315 = 12,9$   
Maximum magnetic flux density :  $6640/6320 = 1,05$   
Rise time of magnetic pulse :  $469/953 = 2,03$   
Fall time of magnetic pulse :  $512/4532 = 8,85$

## Result of benchmarking:

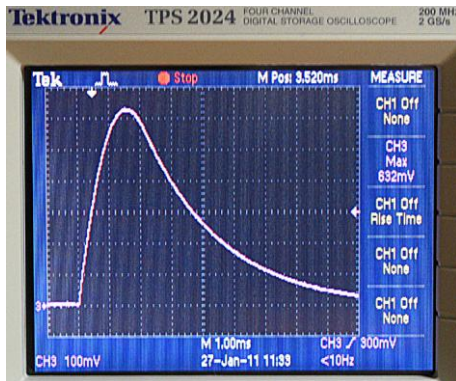
The **PARAPULSER** with 3Hz pulse-frequency outperforms the **SOTA MPG5** by at least factor 12,9 (frequency alone). More realistic would be around factor 15.

See the pictures below with measurement values, taken from the display of the Tektronix oscilloscope:

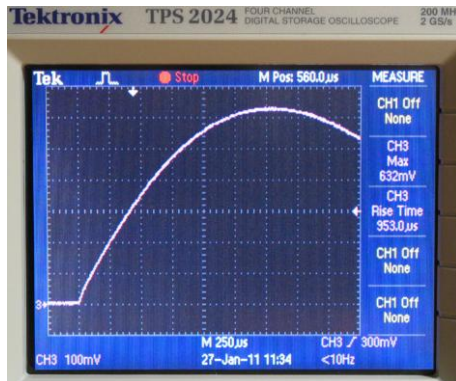


Direct pulse-shape comparison:  
**SOTA MPG5** (white curve)  
**PARAPULSER** (blue curve)

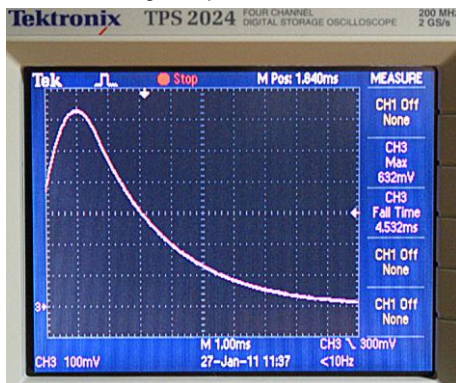
**SOTA MPG5**  
Shape of magnetic pulse



**SOTA MPG5**  
rise time of magnetic pulse



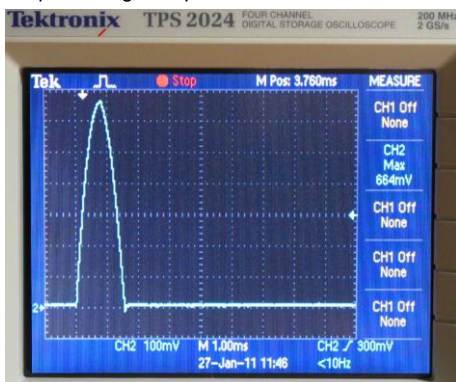
**SOTA MPG5**  
Fall time of magnetic pulse



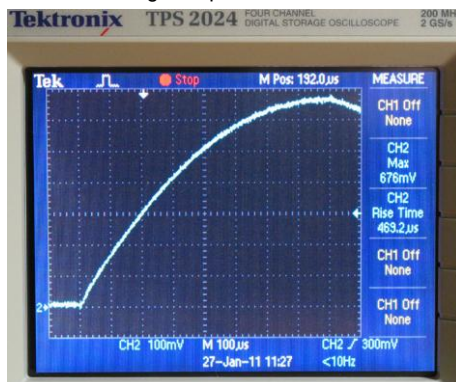
**SOTA MPG5**  
pulse frequency



**PARAPULSER**  
shape of magnetic pulse



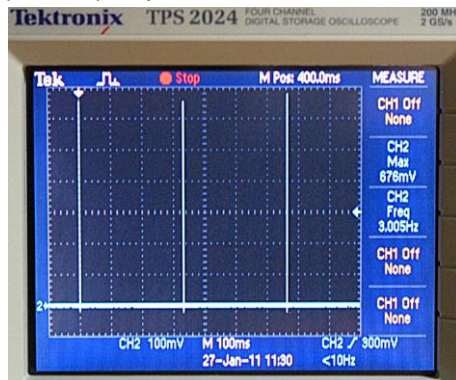
**PARAPULSER**  
rise time of magnetic pulse



**PARAPULSER**  
fall time of magnetic pulse



**PARAPULSER**  
pulse frequency



Comparison of design size:

PARAPULSER has all the electronics already integrated in the handhold

