RSSI GmbH Radio Sensor Solutions

Readout technology for Passive Wireless Sensors (PWS)

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Radio Sensor Solutions

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Outline

- History
- Energy storage in PWS
- PWS as cooperative RADAR TargetTest Setup
- Types of RADAR
- Conclusion
- Outlook

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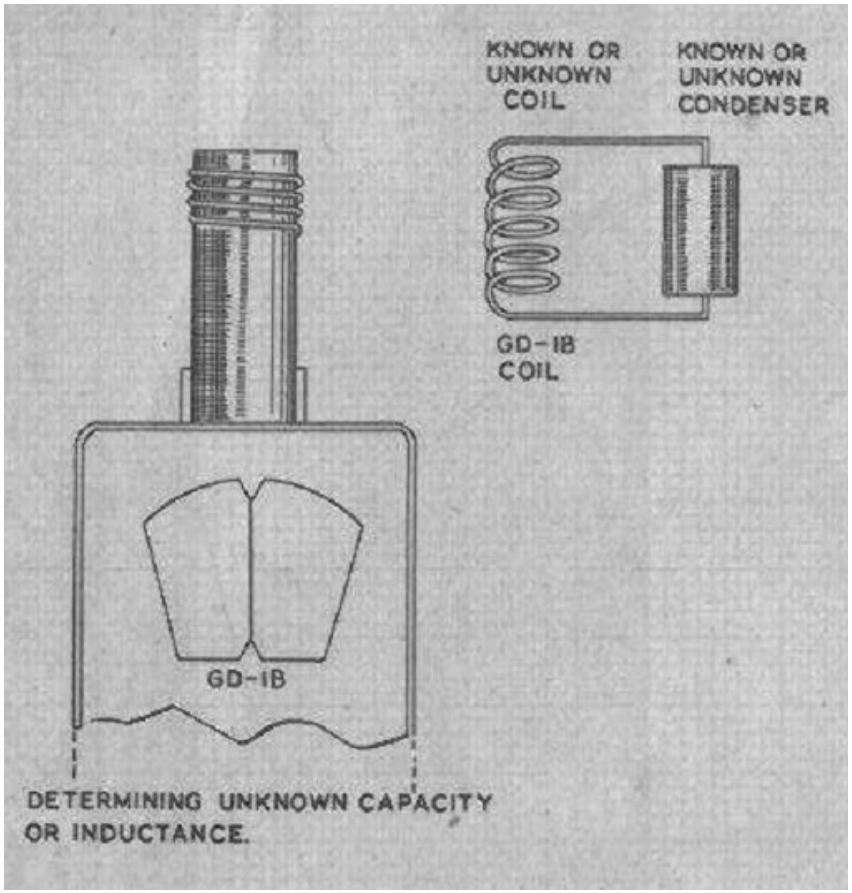
History

- PWS reader from 1954
- Grid Dip meter to find resonance frequency of LC Circuit or Antenna



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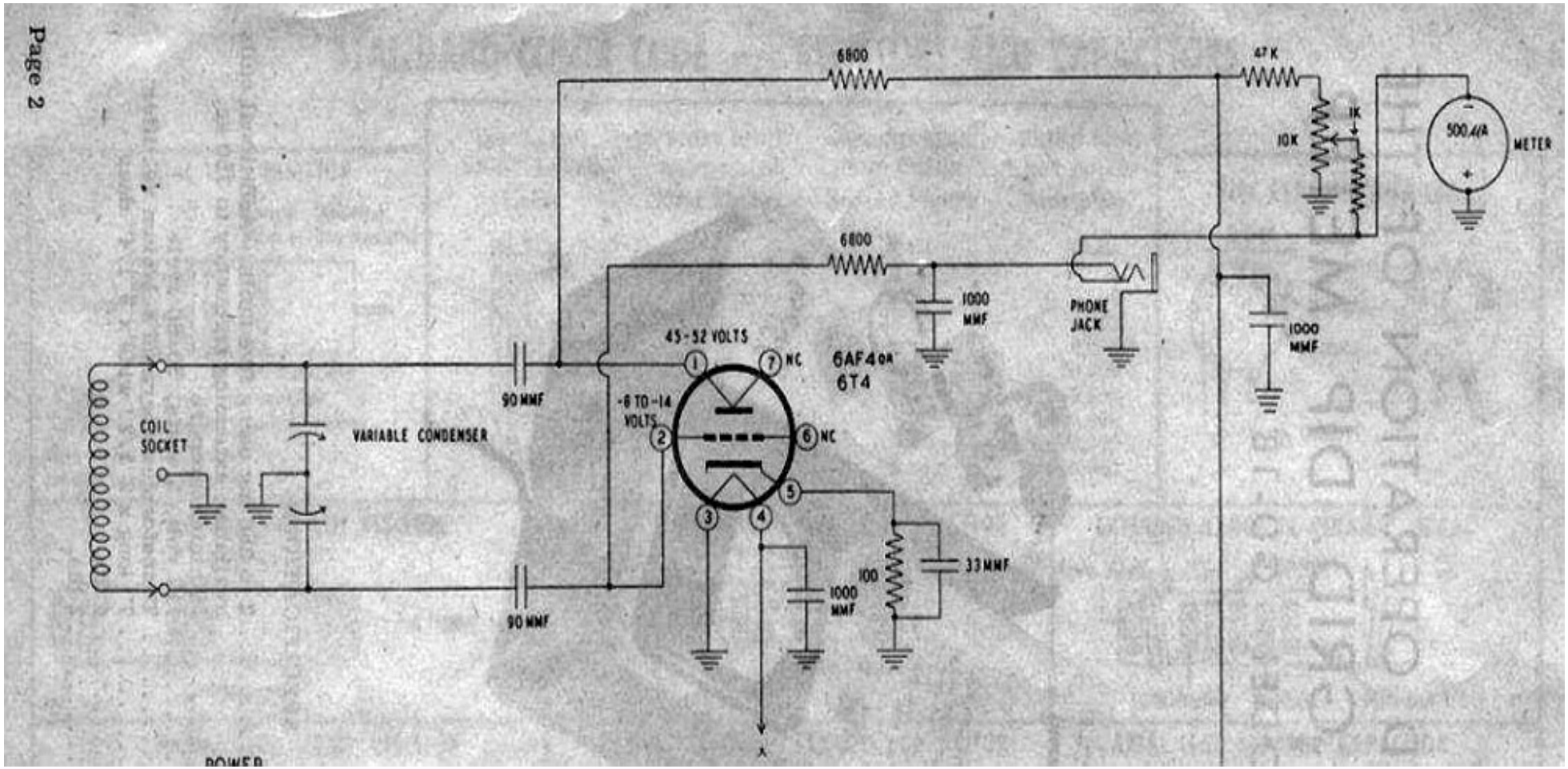
- **Energy withdrawn from oscilator detected as DIP in grid current**



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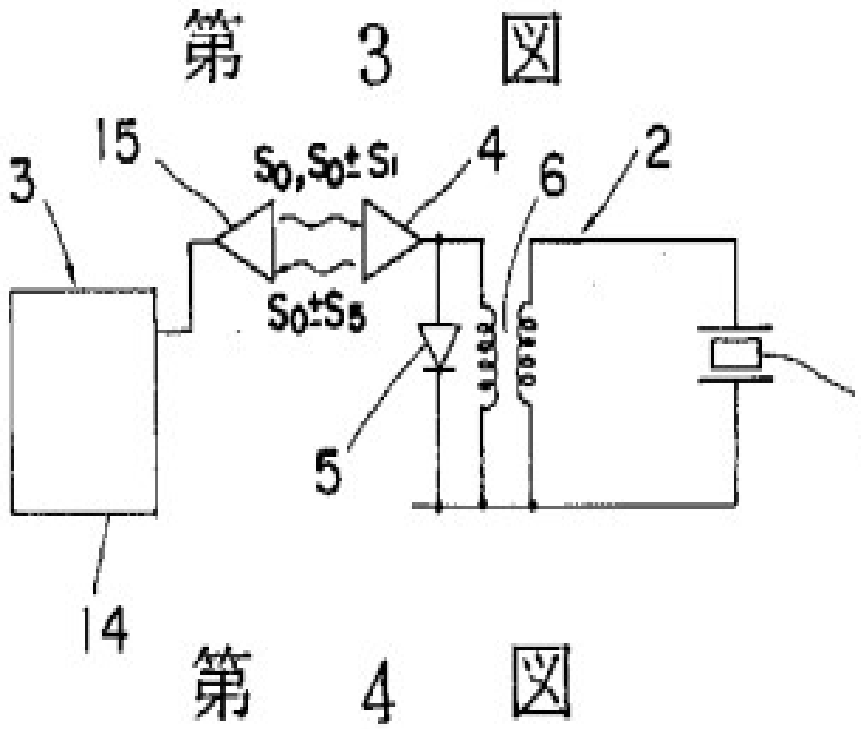
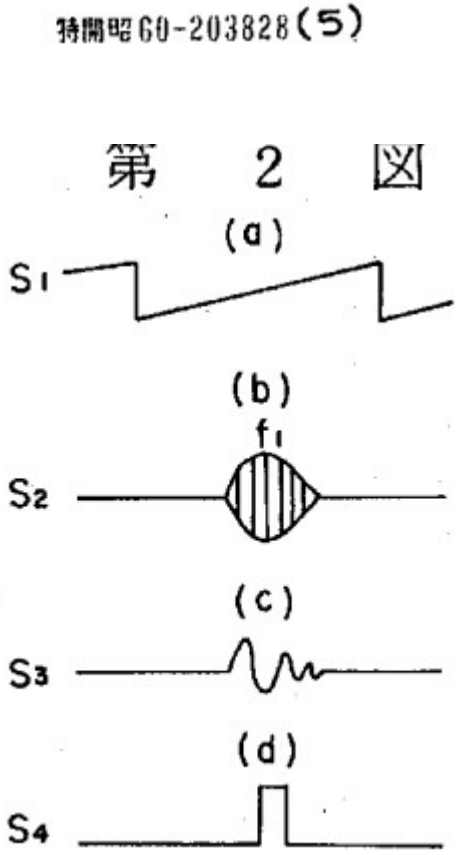
- **WPS for temperature measurement in human body 1984 JP60-203828**





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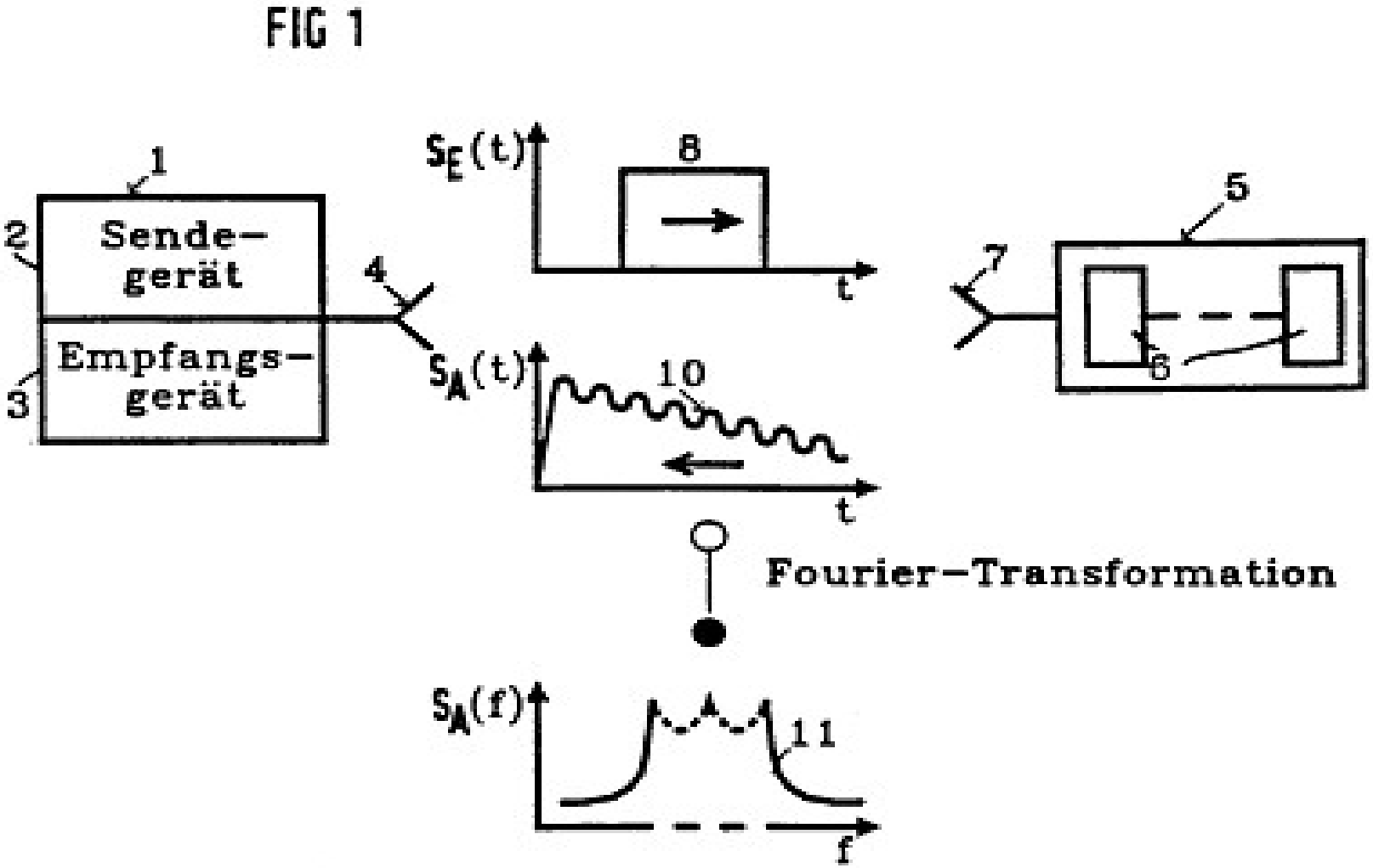
- 1994 SAW device allows storage of RF energy
- DE 4413211



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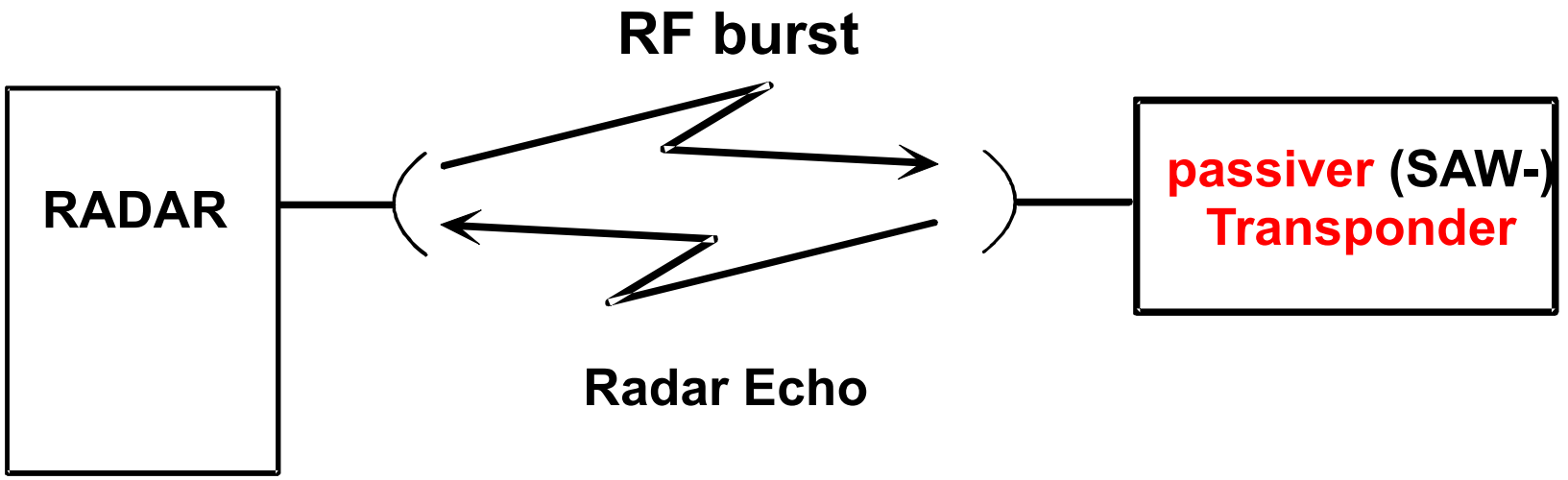
RADAR with cooperative Target



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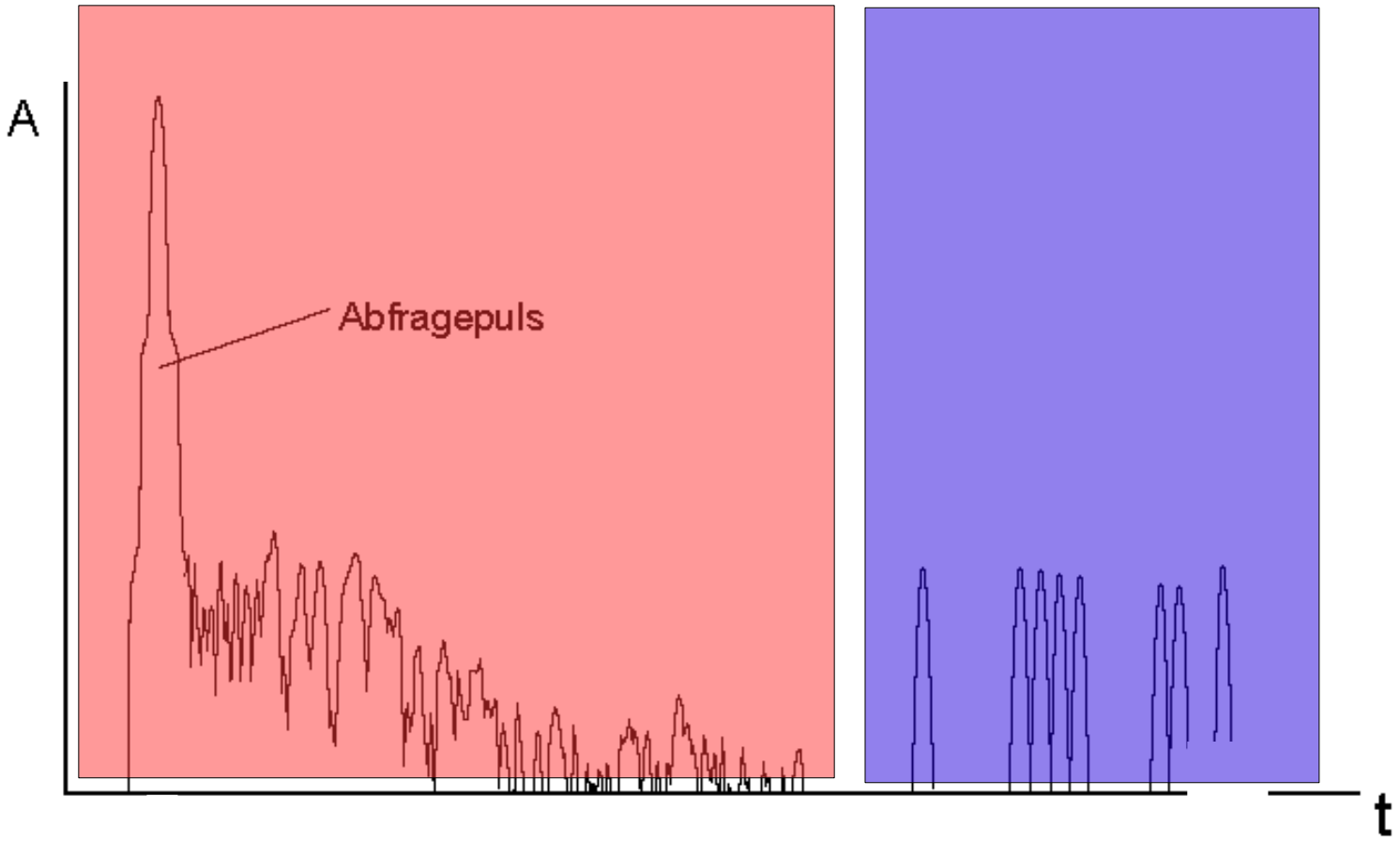
RADAR with cooperative Target



Environmental Echos

Cooperative Target

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Resonator as cooperative Target

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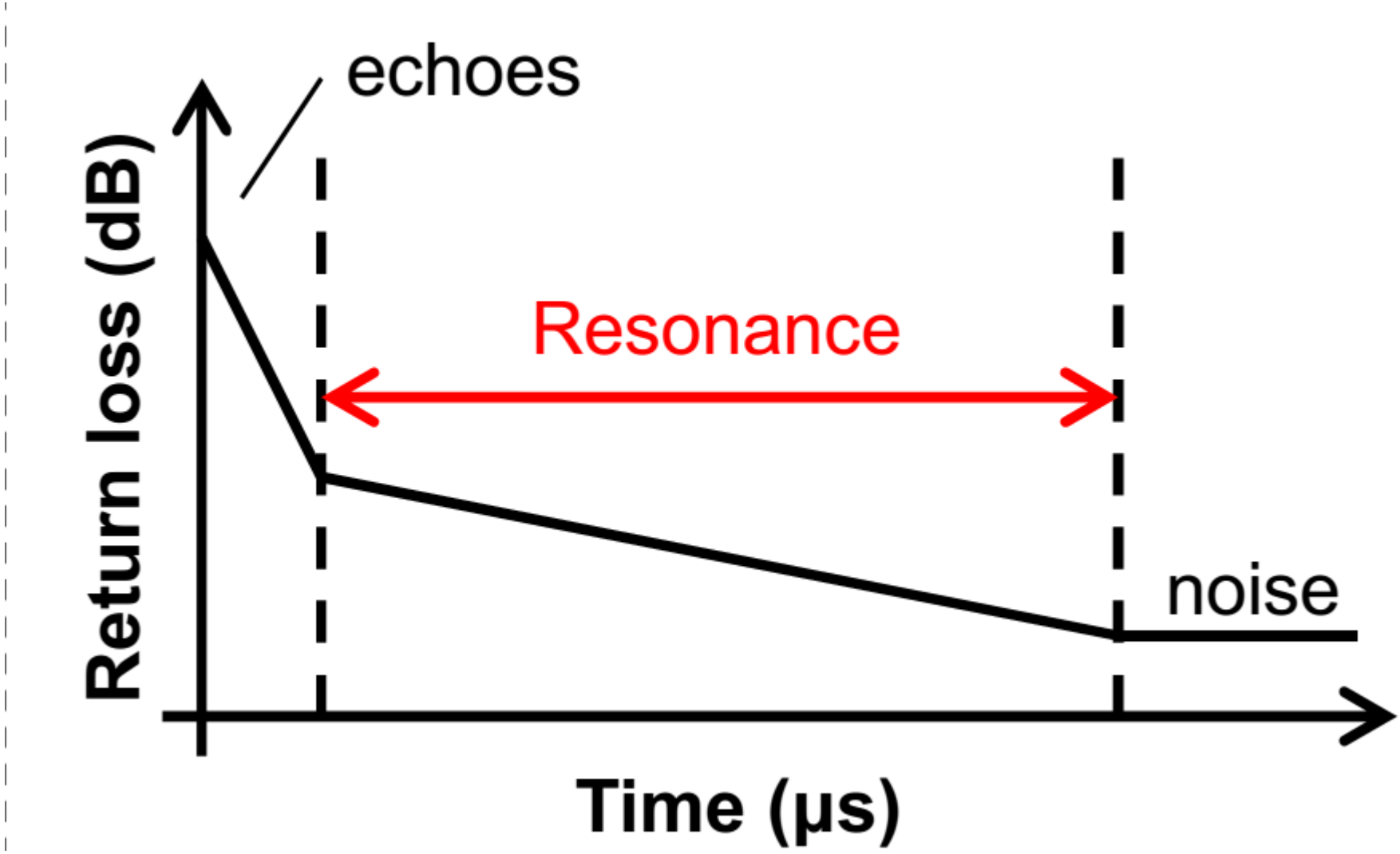

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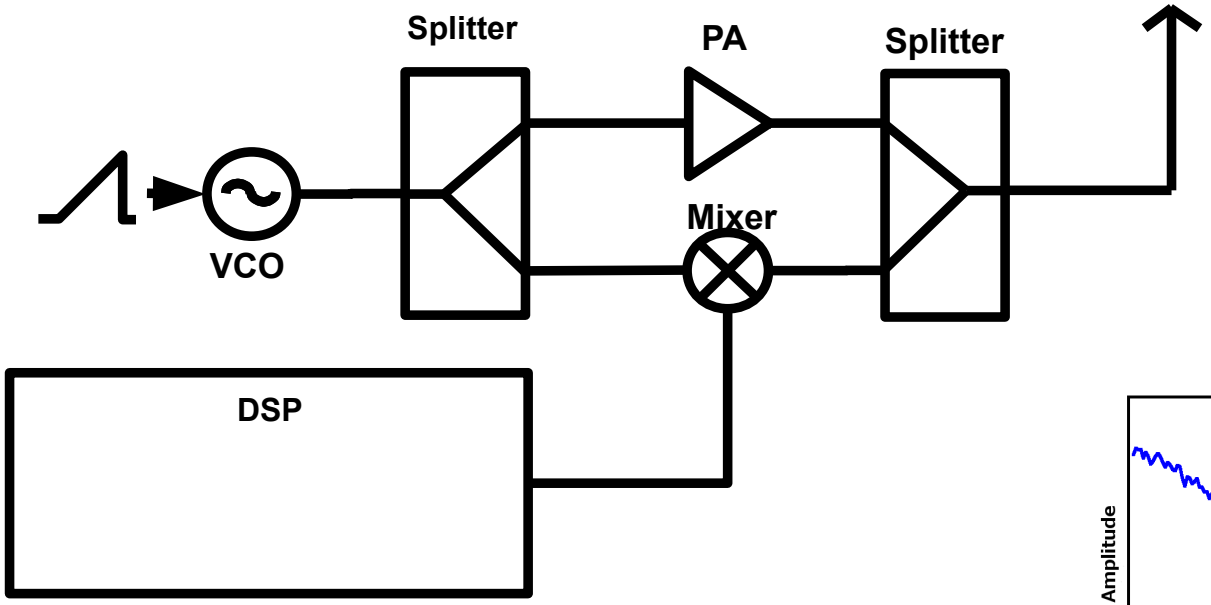
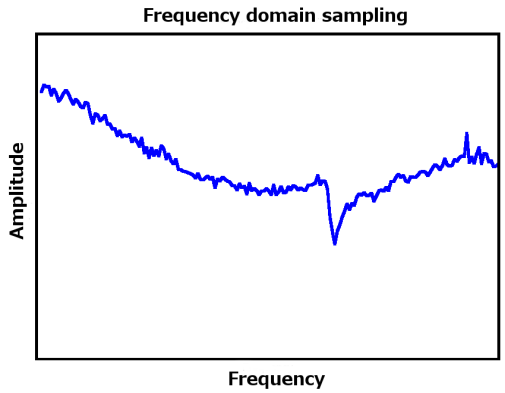
Frequency domain sampling





- Simultaneous transmit and receive required
- Network analyzer measurement of Resonator S11
- Slow and cheap

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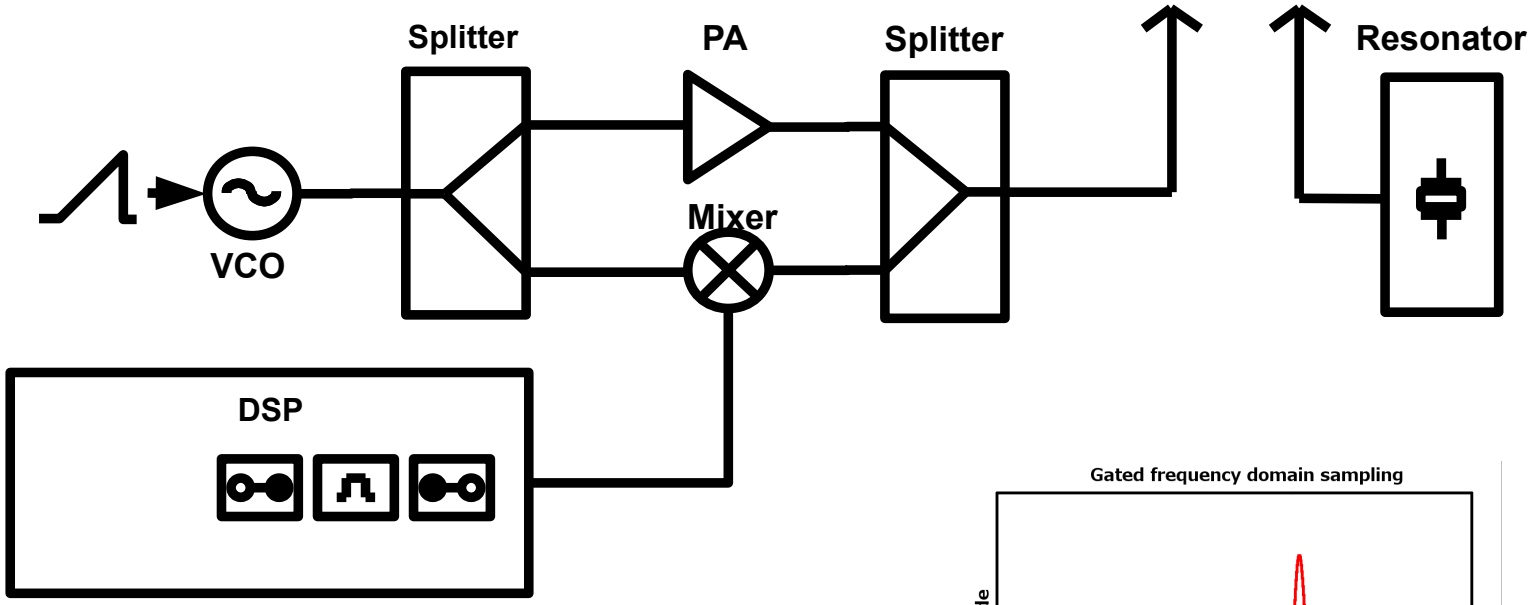
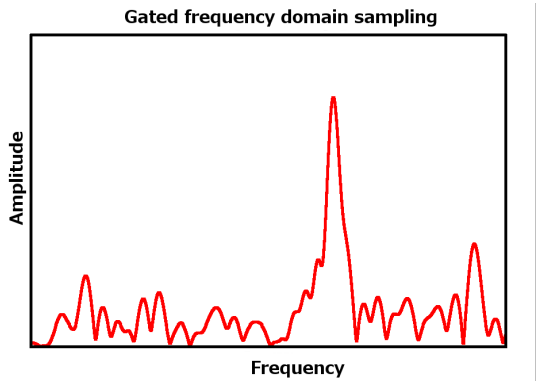
Time gated Frequency domain sampling





- Transform to time domain
- Cut off environmental echoes
- Retransform to frequency domain

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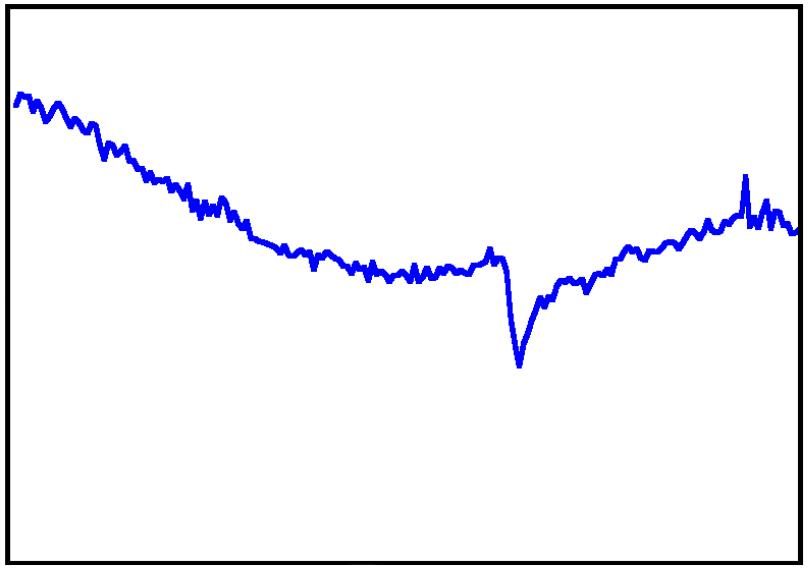
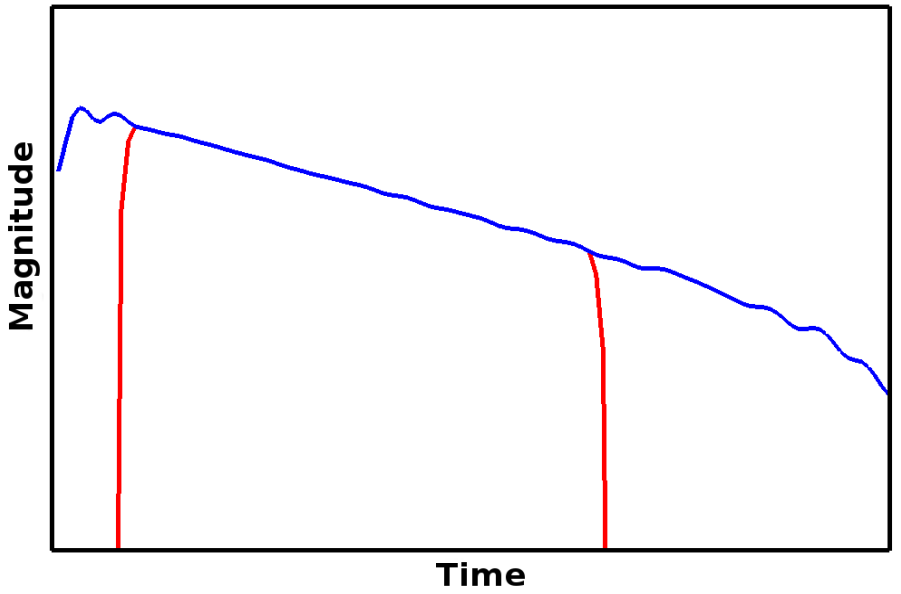
Time gating

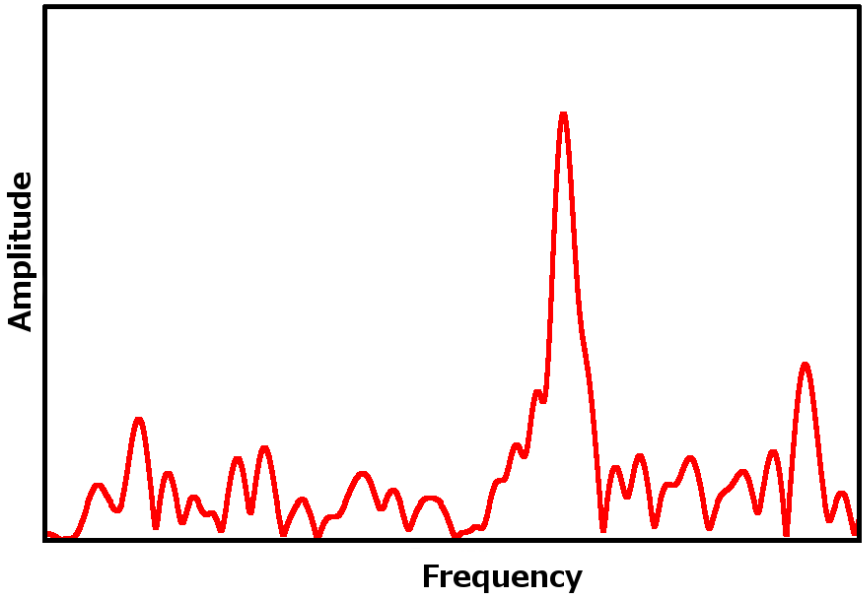
Frequency domain sampling



Time domain and gated timedomain



Gated frequency domain sampling



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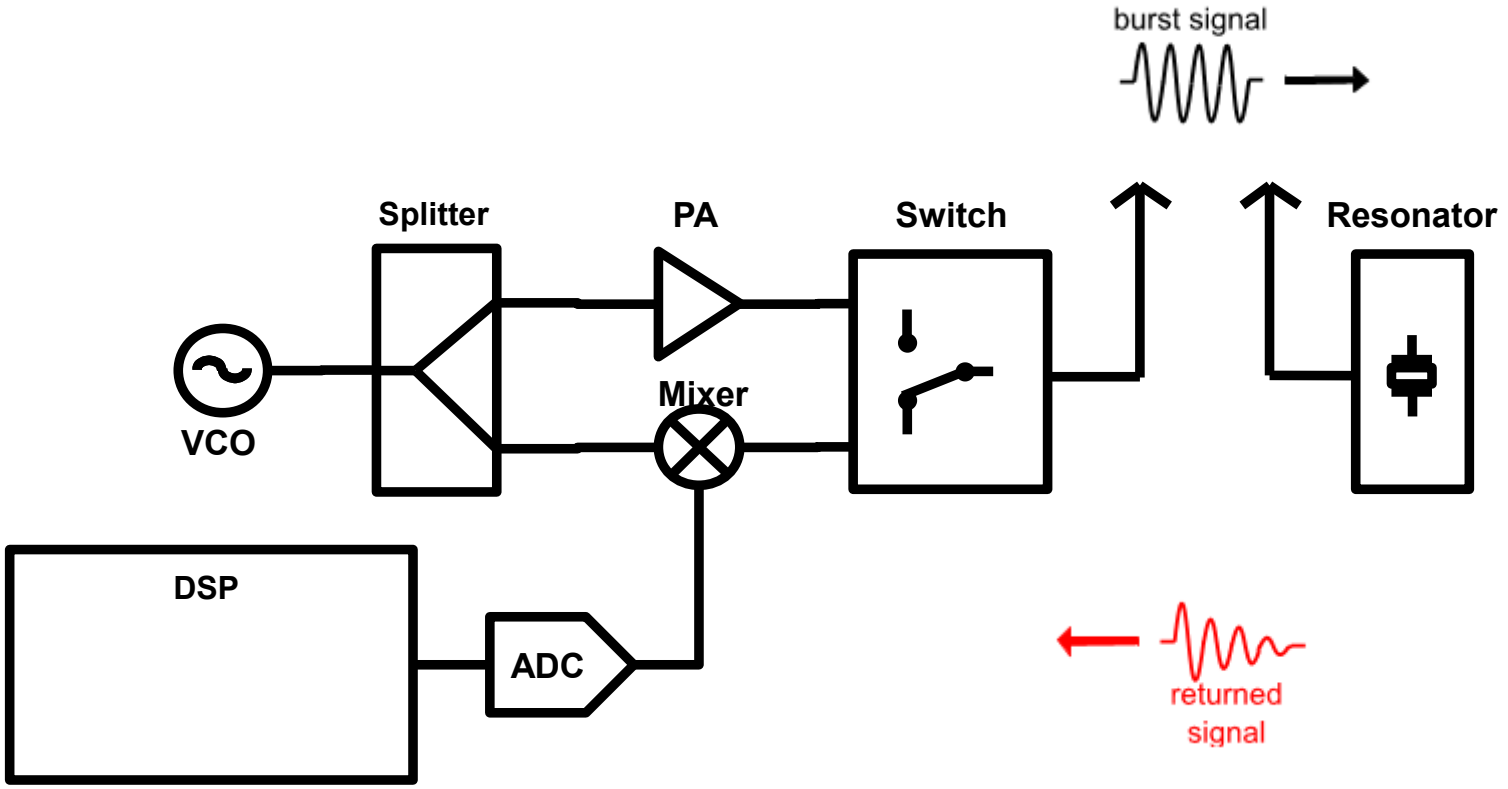
Time domain sampling



- Exciting resonator with burst
- Measuring echo frequency
- Fastest possible measurement
- Practical limit computation and data transfer

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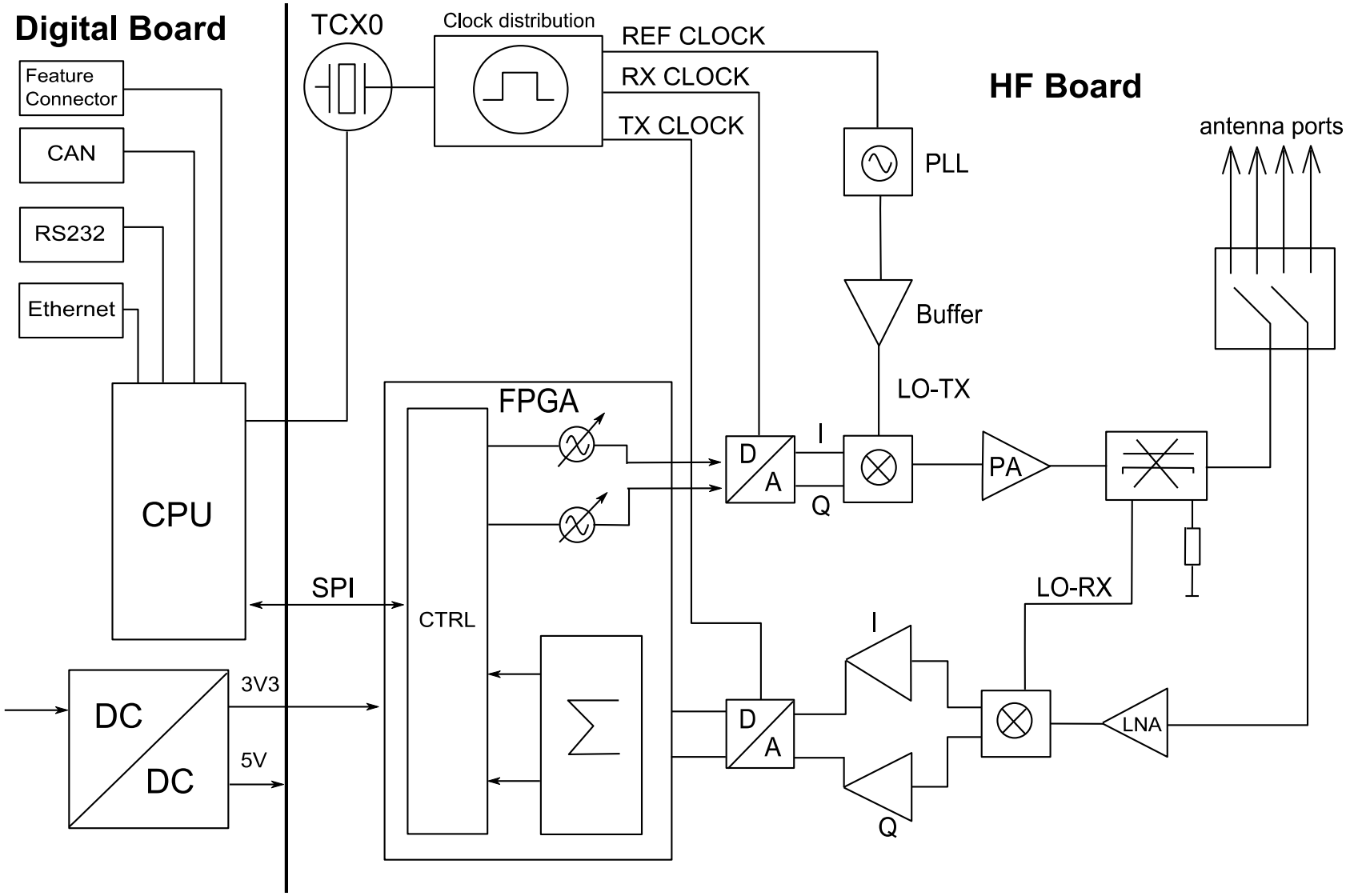
Software Defined Radio



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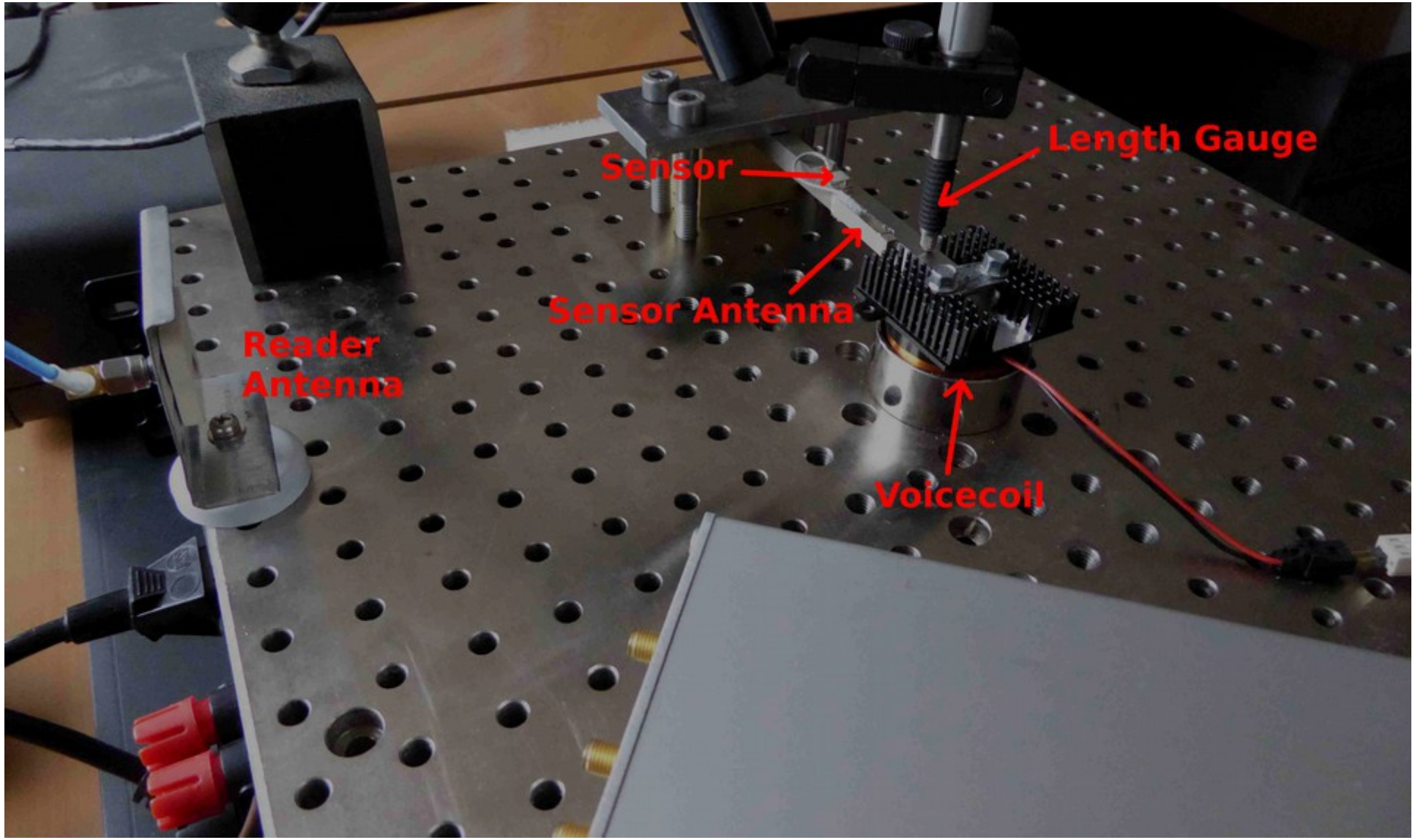
Test setup



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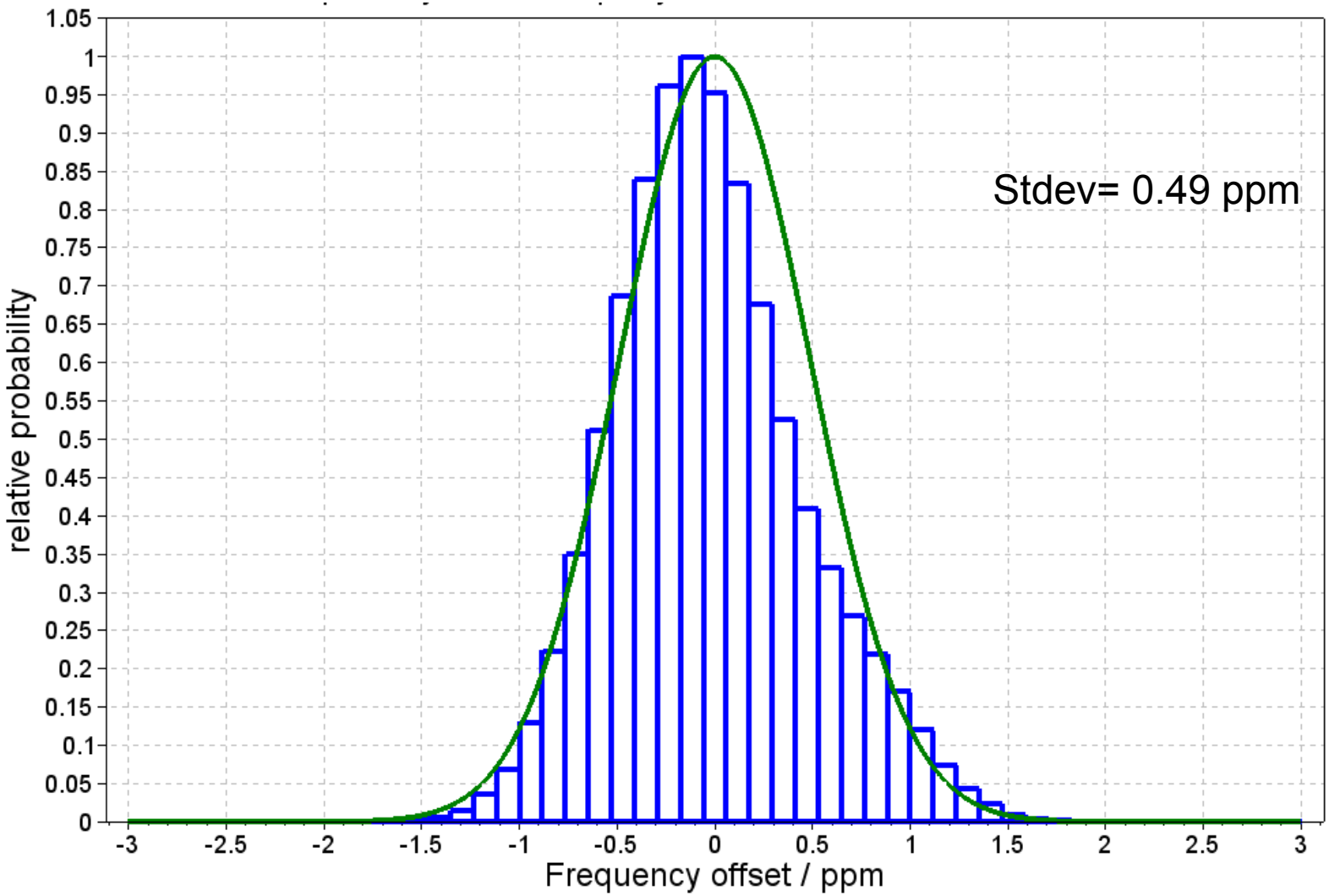
Typical error distribution

Time domain Sampling 2.45 GHz with 1000 Samples / sec



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For Your Attention

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