

BIO PAC



BIOPAC
Systems, Inc.
Registered to ISO 9001:2008

*Inspiring people and
enabling discovery about life*

How to get Great ECG Data: HRV and RSA Analysis Essentials

Frazer Findlay



Our Agenda Today

Setup

Hardware setup

Software setup

Participant setup

Quality

Data quality check

Analysis

Analysis

Q and A

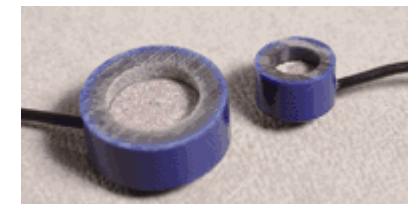
How to get great ECG Data

Hardware Components

MP150 – Wired



Reusable:
[EL250-series](#)



Disposable:
[EL500-series](#)



[LEAD110-series](#)



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Hardware Components

MP150 - wireless



MP150



BN-RSPEC /
BN-ECG2



RSPEC-T /
ECG2-T



BN-LOGGER



Components:

BN-RSPEC / BN-ECG2
BN-EL30-LEAD3



EL500-series /



EL650-series /



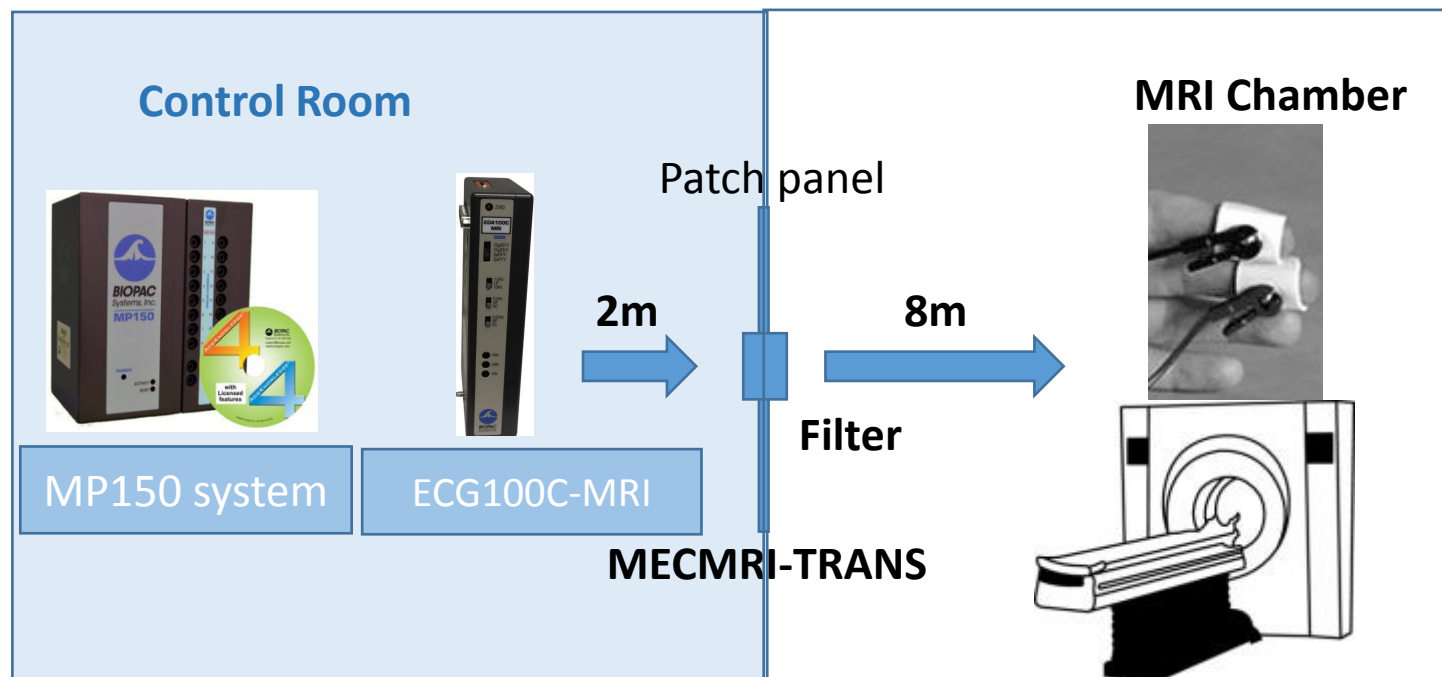
BN-BIOSHIRT



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Hardware Components

MP150 - MRI



Components:

Amplifier: ECG100C-MRI,
Cables and filter: MECMRI-TRANS
Leads: 3xLEAD108B
Electrodes : EL508

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Hardware Components

MP36R



MP36R



SS2LB



SS1LA

Reusable:
EL600-series



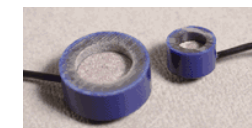
Disposable:
EL500-series



Reusable:
EL600-series



Reusable:
EL250-series



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Hardware Setup

MP150 - wired

Mode - Norm

Gain 2000

Low Pass Filter
35Hz

High Pass Filter
1Hz

Unique channels

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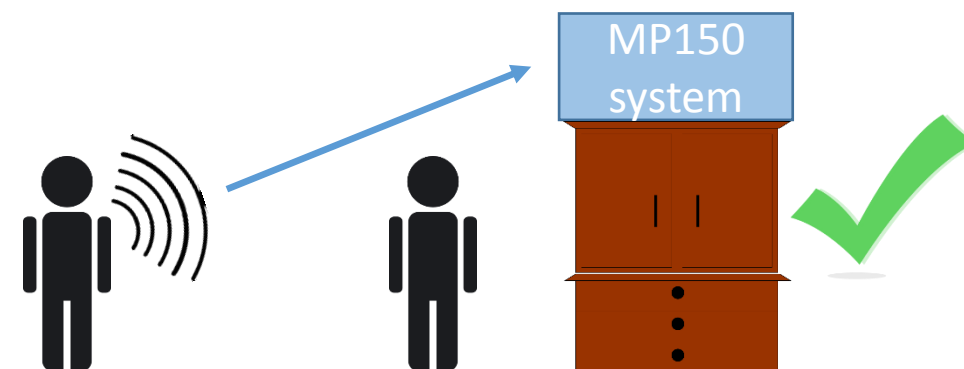


Hardware Setup

MP150 - wireless

Battery level

Signal transmission



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Hardware Setup

MP150 - MRI

MRI safe/conditional

Only carbon fiber

Safe use of gel

Test outside

Filter grounding

CBL205-MRI

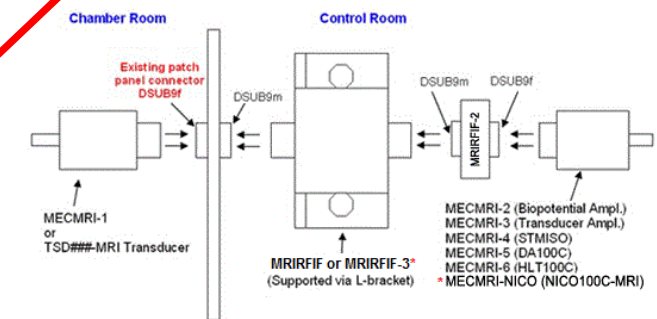
Details
Support

COMPATIBILITY

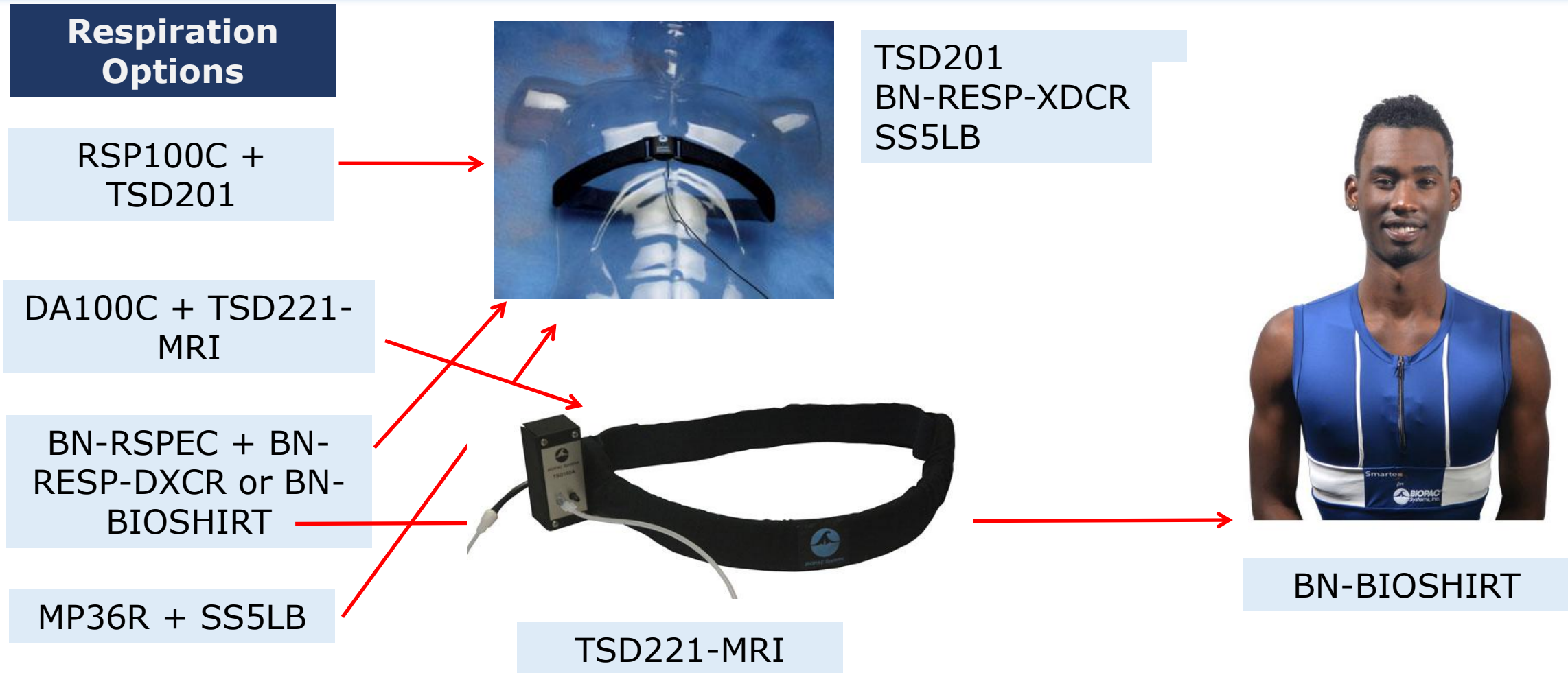
[Biopac Science Lab Systems](#)
[BSL MP36 Systems](#)
[BSL MP45 Systems](#)
[MP150 Research Systems](#)
[MP36R Research Systems](#)

MRI Use: Conditional to 7T-

Condition: Up to 7T, any scanning sequence; up to 9T on animals. Use with LEAD108 series only. (See Specifications for components.)

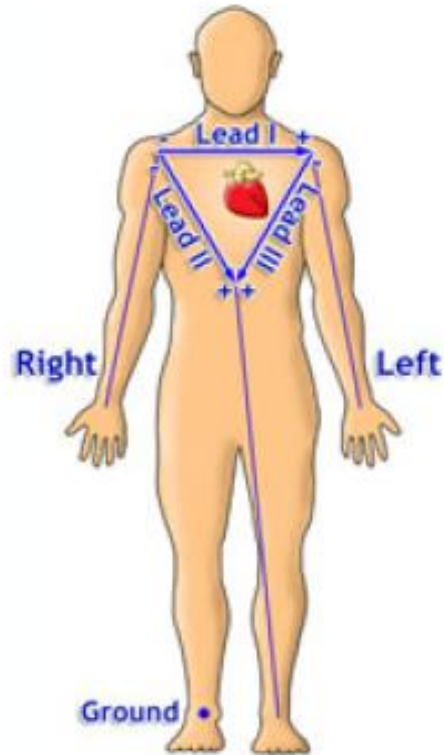


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LEAD II Configuration



LEAD

LEAD II

Ground

NB:

Polarity

right clavicle (-) to left lower rib (+)
OR
right arm (-) to left leg (+)

Left clavicle or left wrist

No ground required if
GSR100C/EDA100C/EDA100C-MRI
electrodes are connected to
subject.



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Subject Preparation



ELPAD



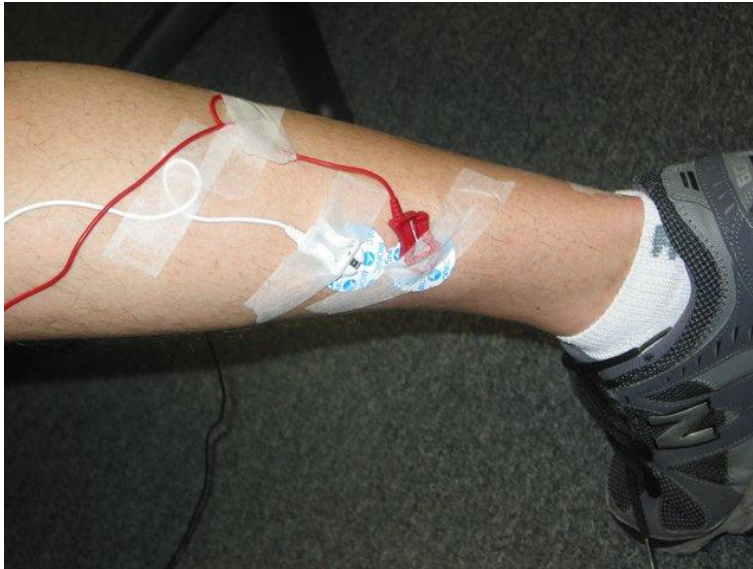
GEL100



EL-CHECK

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Subject Preparation



TAPE1

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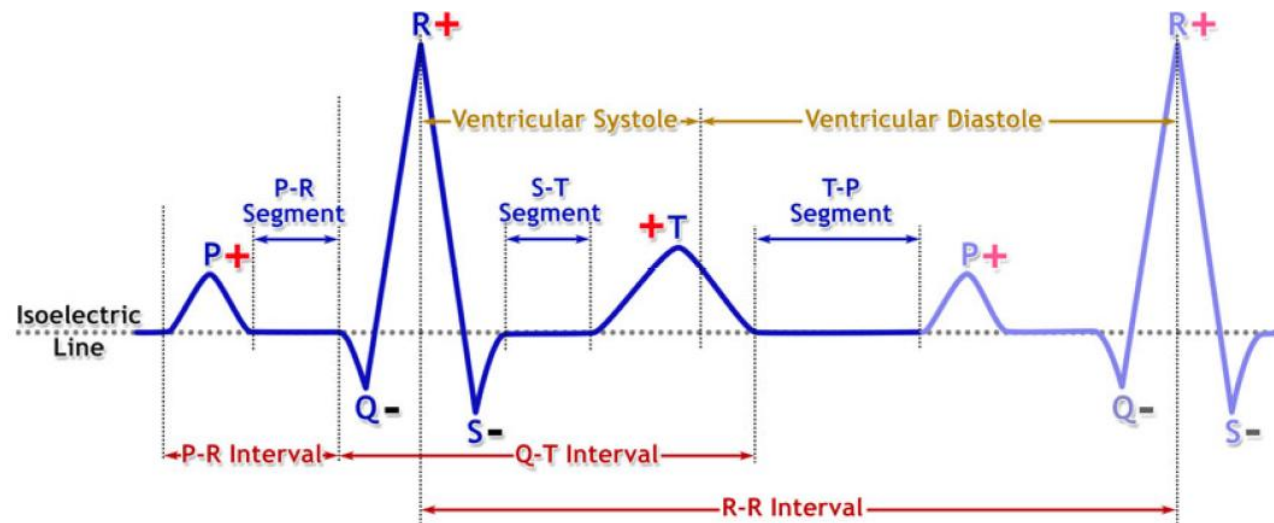


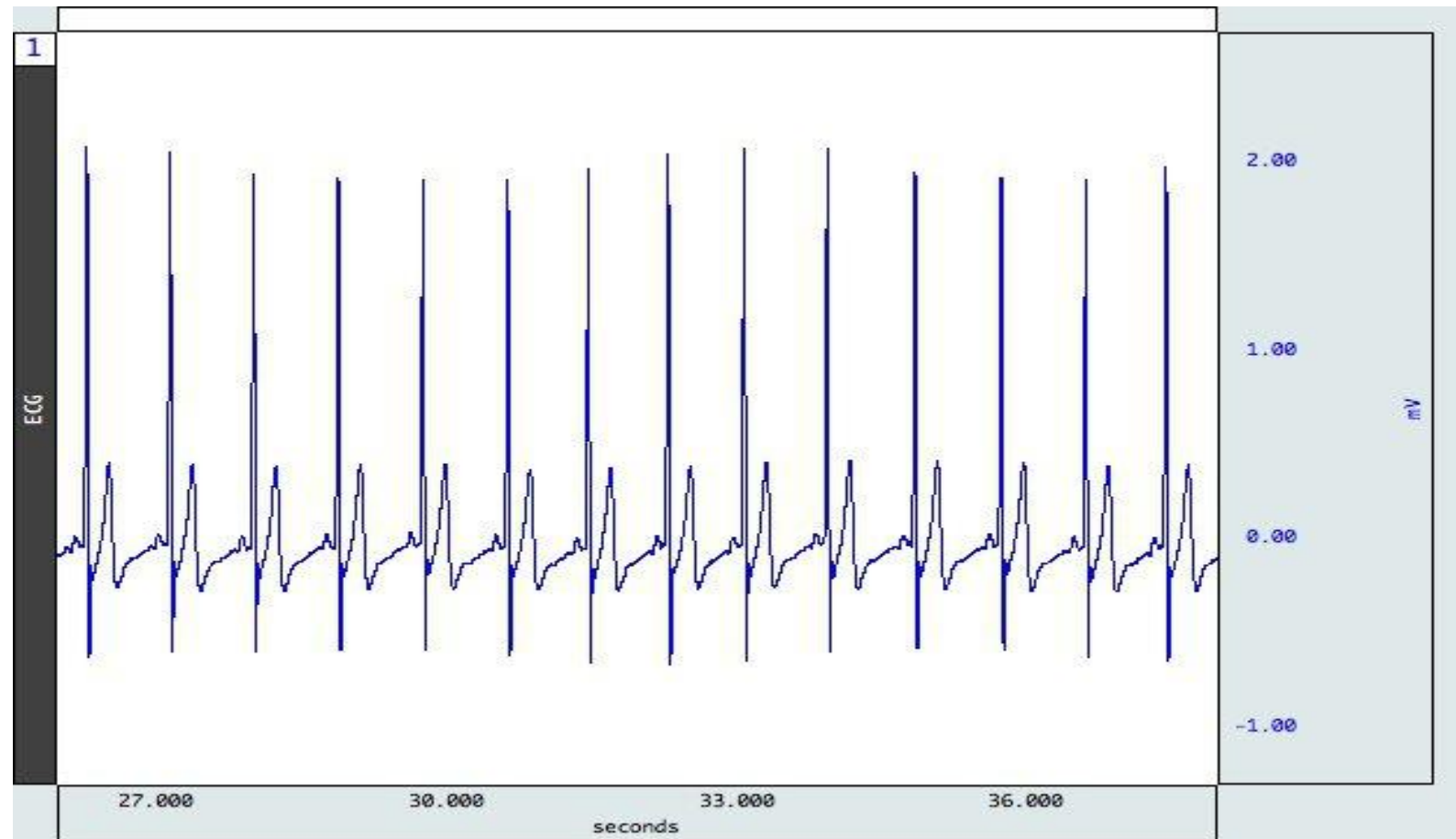
Fig. 5.2 Components of the ECG & Electrical and mechanical events of the cardiac cycle

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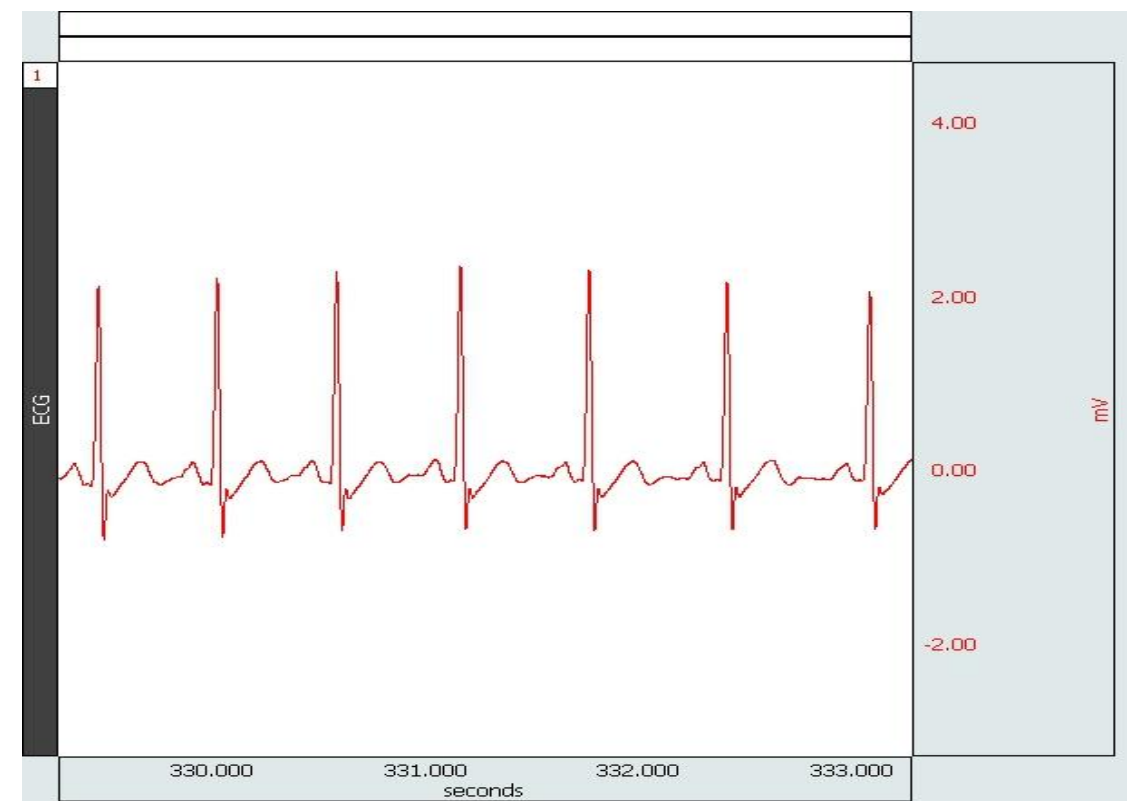
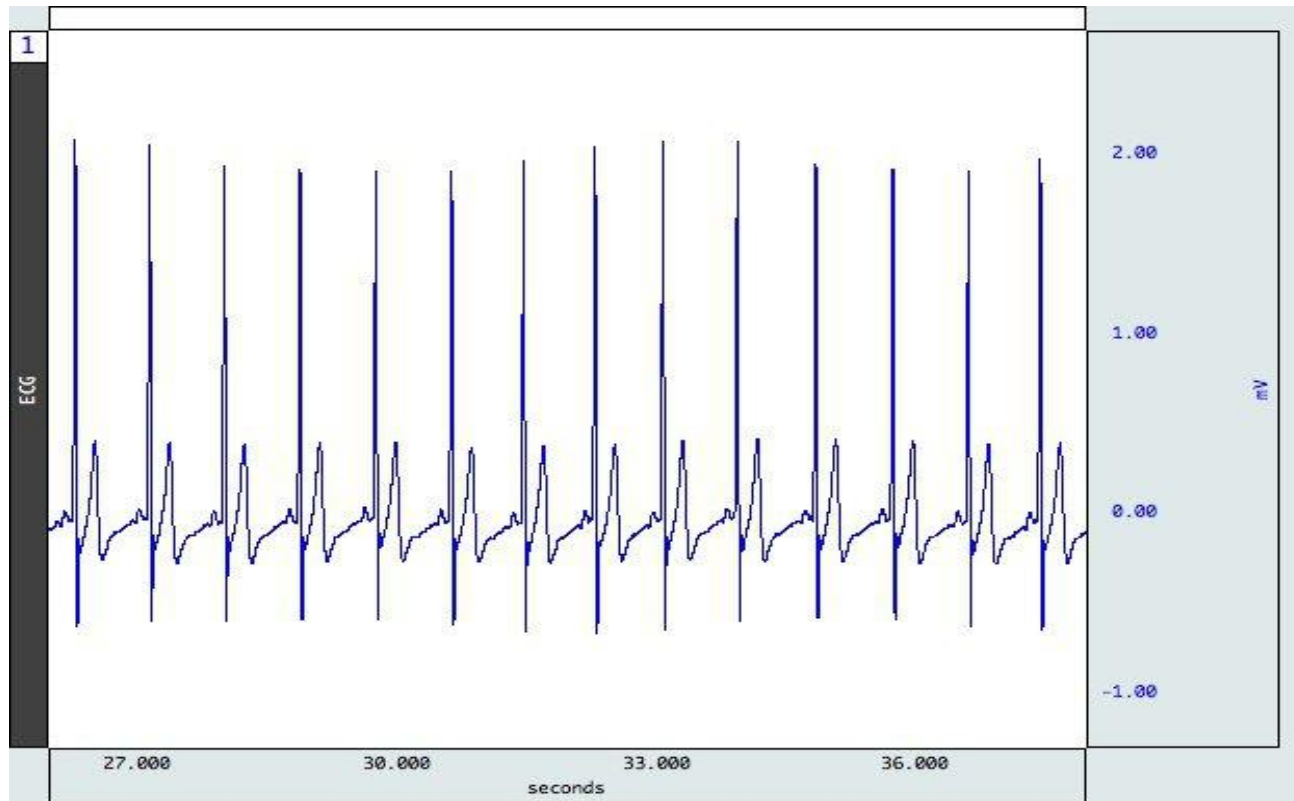
Software Setup

Sample rate

1 kHz minimum

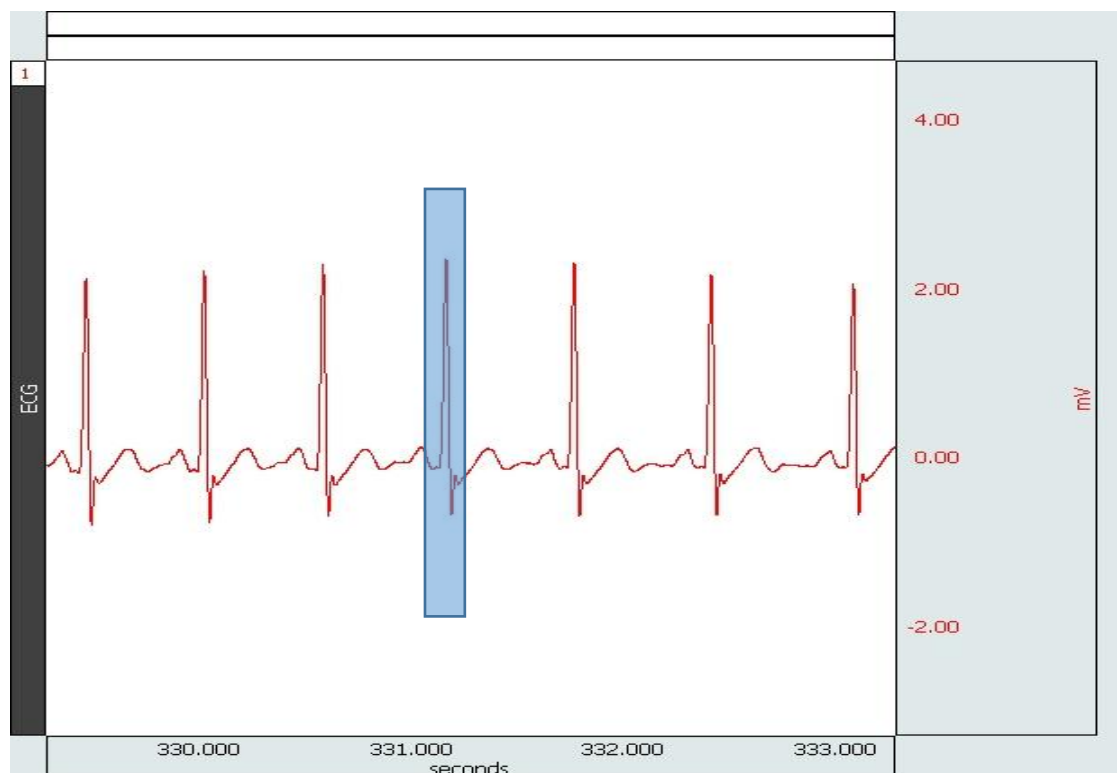


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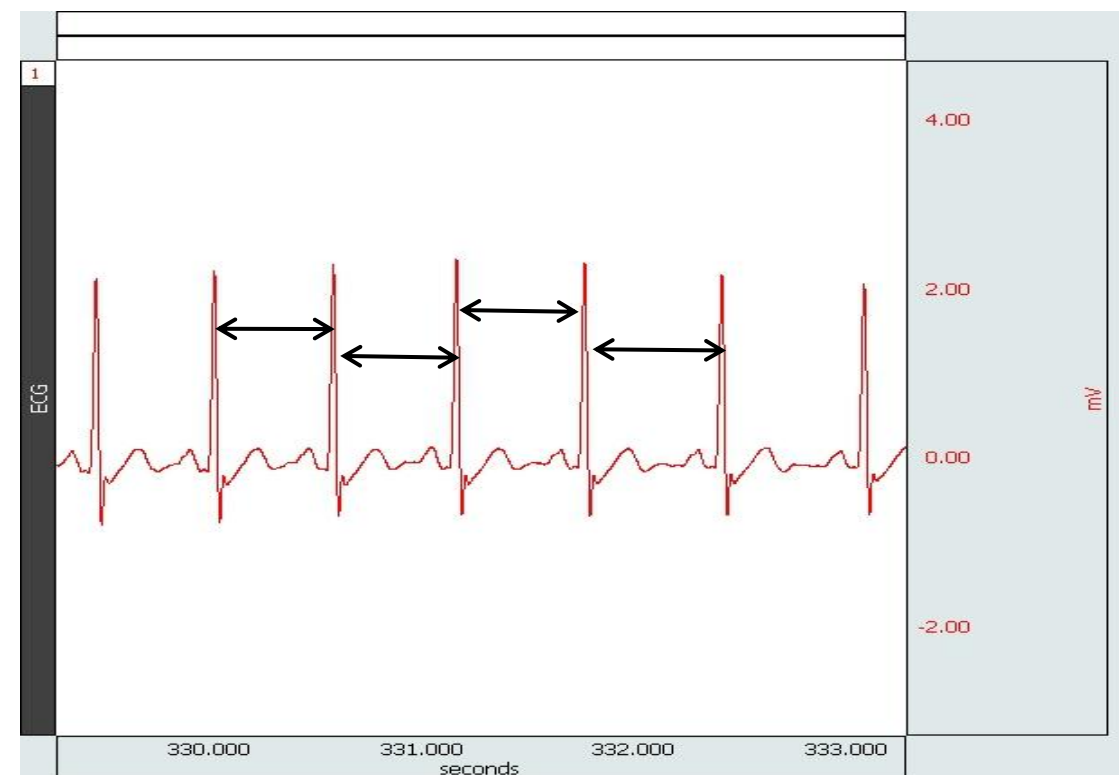


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QRS Complex

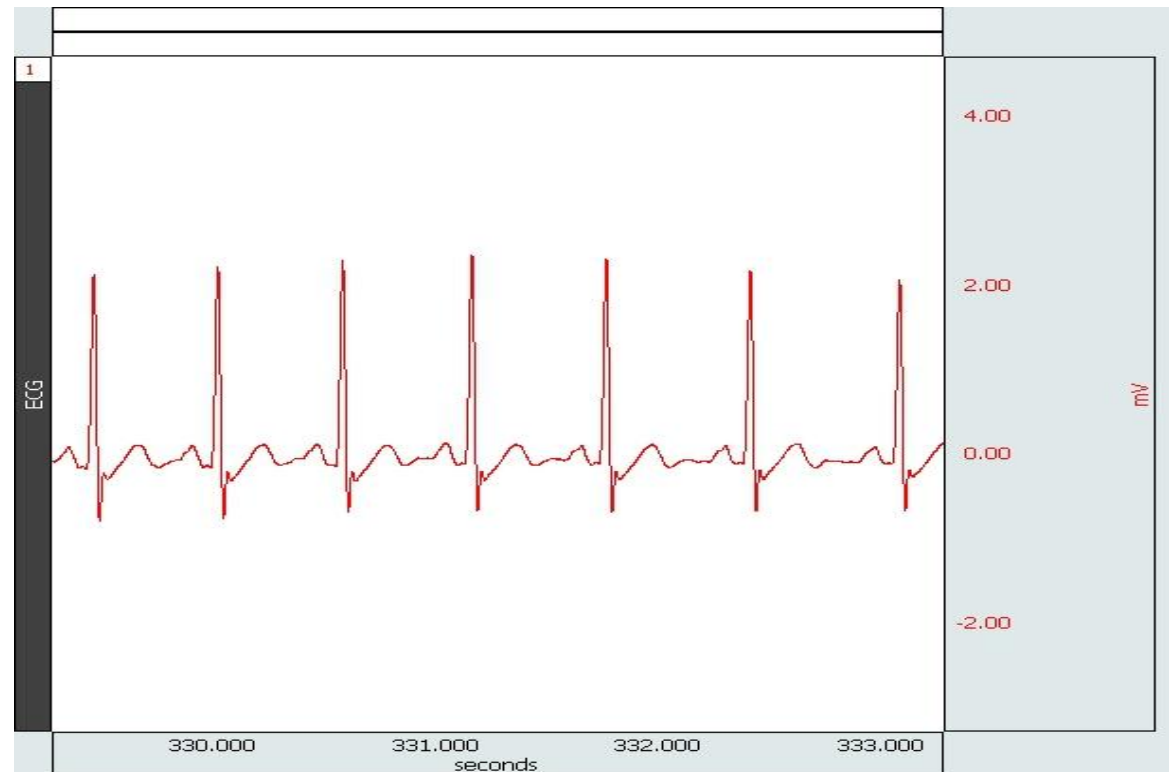


R-R Interval



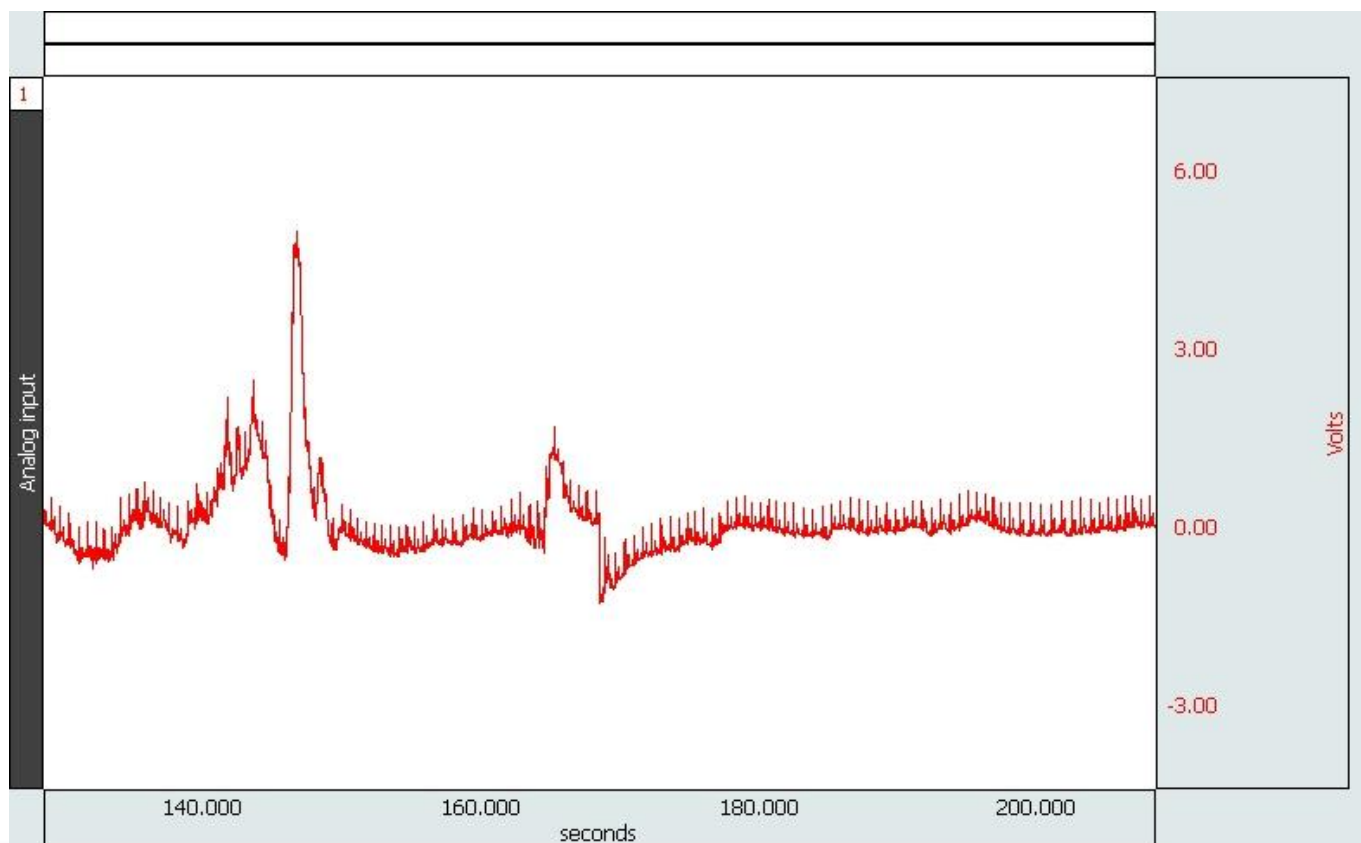
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Preparing Data



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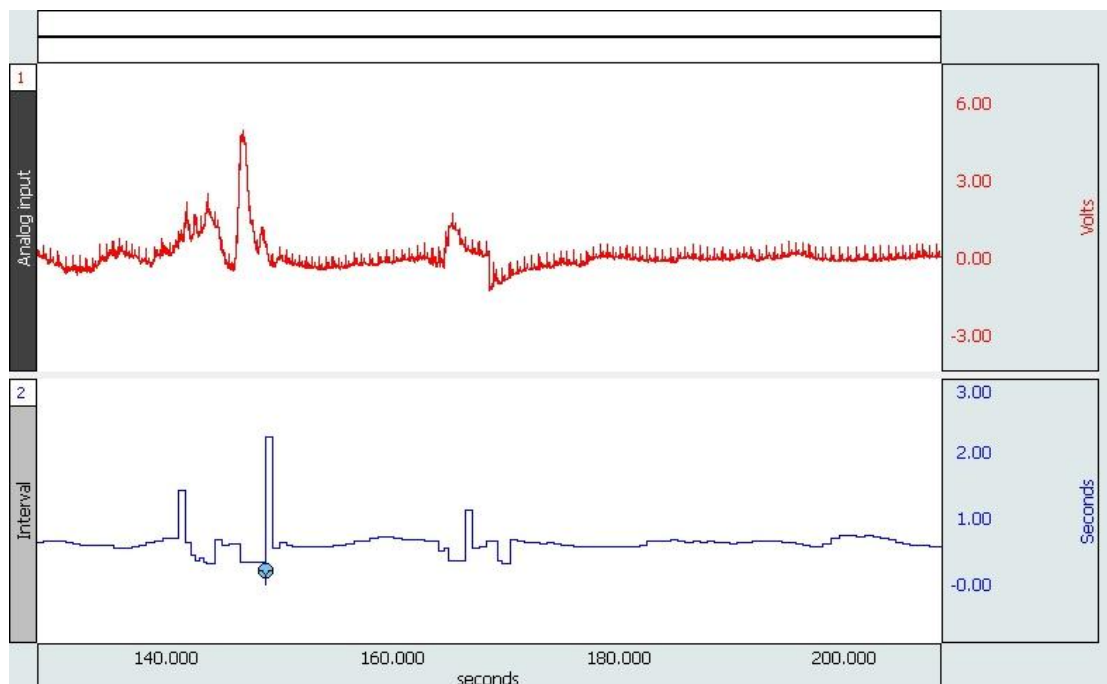
Poor Quality Data



“Results reveal that even a single heart period artifact, occurring within a 2-min recording epoch, can lead to errors of estimate heart period variability that are considerably larger than typical effect sizes in psychophysiological studies.” — Berntson & Stowell, 1998

How to get great ECG Data

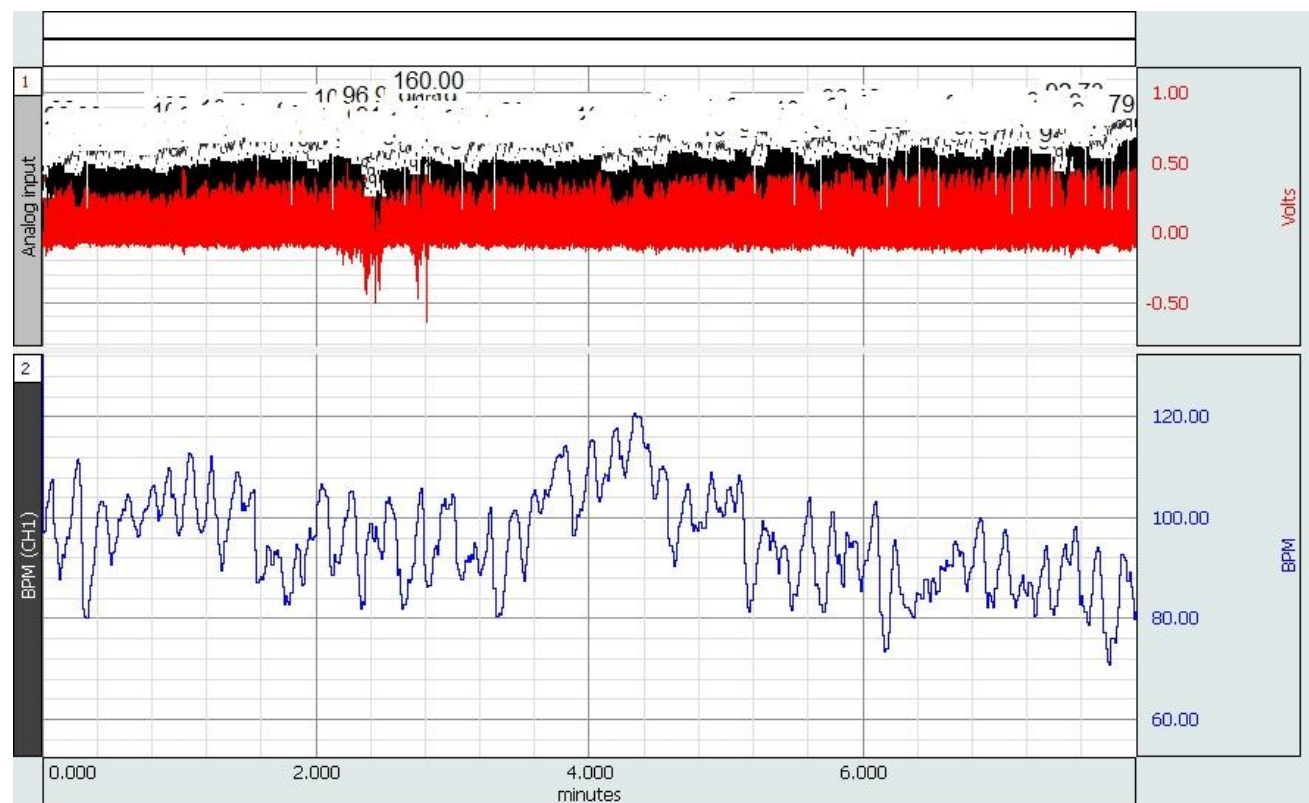
Poor Quality Data



“Results reveal that even a single heart period artifact, occurring within a 2-min recording epoch, can lead to errors of estimate heart period variability that are considerably larger than typical effect sizes in psychophysiological studies.” — Berntson & Stowell, 1998

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Quality Data



“Results reveal that even a single heart period artifact, occurring within a 2-min recording epoch, can lead to errors of estimate heart period variability that are considerably larger than typical effect sizes in psychophysiological studies.” — Berntson & Stowell, 1998

Demonstration Time

Single Epoch HRV - Spectral

Multi-epoch HRV and RSA - Spectral

Multi-epoch HRV - Statistical

RSA – Time-series (outlined by Grossman, P., van Beek, J., & Wientjes, C. (1990))

Locate ECG Complex Boundaries

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Questions and Answers

For more information:

www.biopac.com
info@biopac.com



**-Join us Thursday, Sept. 15, 2016, 8:00 AM PT for
“Combining Optical Brain Imaging and Physiological Signals to Study
Cognitive Function”**

-Register at www.biopac.com/webinars

Thank you for your time and attention!