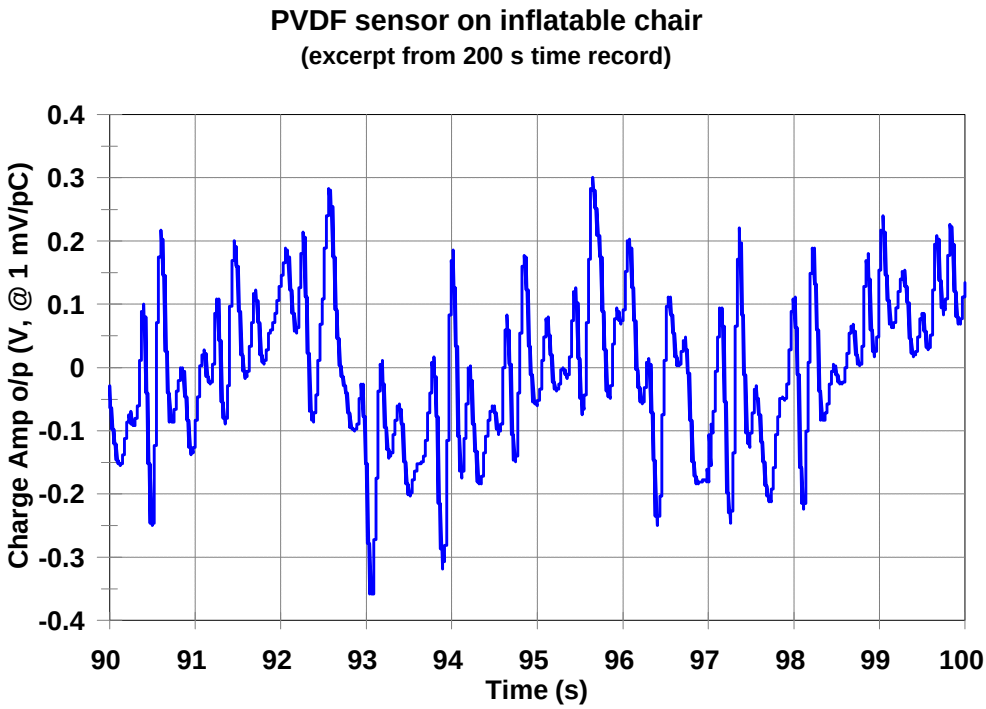
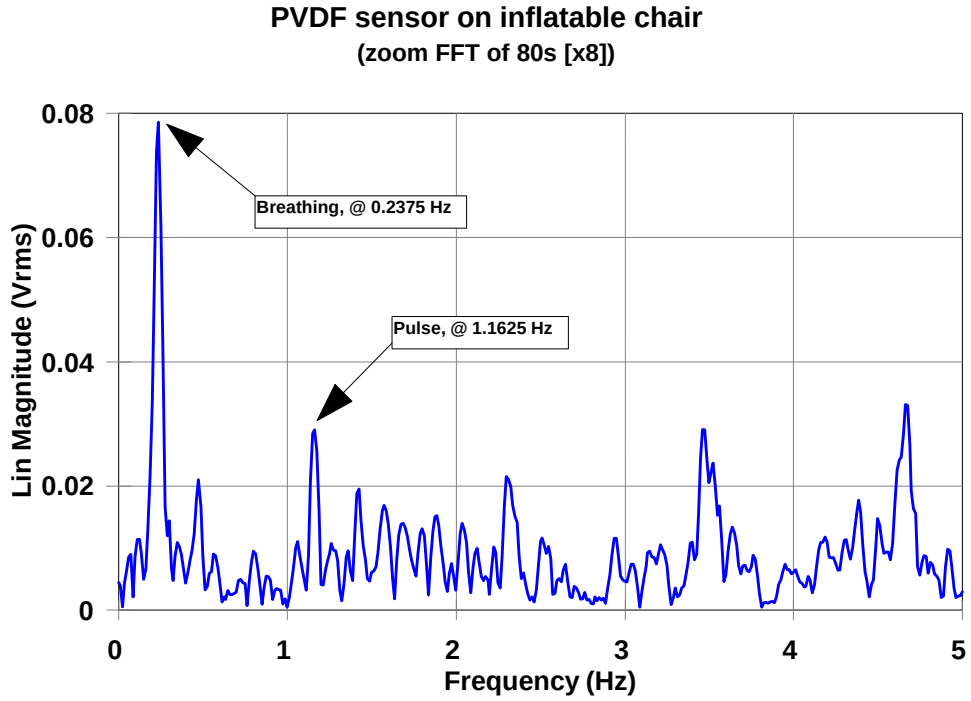
Inflatable Chair Gives Respiration & Pulse Signals

R H Brown, adapted from data collected on 7 September 1999

A custom shielded PVDF sensor with active dimensions 100 x 18 mm ("Voice" pick-up) was fixed using double-coated adhesive tape to an inflated vinyl chair. Signals were recorded using a charge amplifier with 0.2 Hz lower limiting frequency and 1 mV/pC sensitivity settings. A time buffer of 200 s total duration (40 records at 5 s per record) was collected for analysis.

The attached plots show components of breathing at 14.3 breaths per minute (0.2375 Hz) and pulse at 70 beats per minute (1.1625 Hz).


PVDF sensor on inflatable chair
(excerpt from 200 s time record)
Charge Amp o/p (V, @ 1 mV/pC)
0.4
0.3
0.2
0.1
0
-0.1
-0.2
-0.3
-0.4
90
91
92
93
94
95
96
97
98
99
100
Time (s)


PVDF sensor on inflatable chair
(zoom FFT of 80s [x8])
Lin Magnitude (Vrms)
0.08
0.06
0.04
0.02
0
Breathing, @ 0.2375 Hz
Pulse, @ 1.1625 Hz
0
1
2
3
4
5
Frequency (Hz)

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