Response to Exercise Raw Data

For reasons of precision, response to exercise raw data is presented in tabular form (see below). This is real time data, which is updated breath-by-breath. A comma separated ascii file is generated automatically when the exercise run has been terminated. This file can then be imported directly into spreadsheets such as Microsoft Excel to enable users to present data in graphical form.

In addition, a statistical database is generated and contains the following information: Name, Age, Sex, Weight, Reference 1, Reference 2, VO_2 Measured, VO_2 Max Predicted.

Reference 1 and 2 are user defined, and can be used to sort the database according to any criteria. For example this could be used to compare differences between work groups, or perhaps by sport etc.

VO_2 Measured is just that, it could be either sub-maximal or maximal. *If VO_2 Measured* is a maximal value, then *VO_2 Max Predicted* will report that same value. *If VO_2 Measure*d is sub-maximal, then *VO_2 Max Predicted* will predict VO_2max according to predicted maximum heart rate.

All response to Exercise Data is automatically archived and any record can be retrieved at a later date for analysis.

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Date 221204 **Name** Sxxxxxx Bxxx **Sex** M **Age** 27
Height 175 cm **Weight** 78.5 kg
Atmos Pres 760 mmHg **Temperature** 20 C **Humidity** 60%

Ev	Time	VE	%O2	VO2	vo2bw	%CO2	VCO2	RR	VeO	Tv	RER	VeC	HR	Watts
	1 : 2	**23.6**	19.25	**0.42**	5.0	**1.34**	0.31	**23**	56	**1.03**	0.74	**77**		
	2 : 3	**26.5**	16.7	**1.18**	15.0	**3.51**	0.92	**20**	23	**1.33**	0.78	**29**		
1	3 : 3	**29.1**	16.45	**1.34**	17.0	**4.02**	1.16	**21**	22	**1.38**	0.86	**25**	105	**60**
	4 : 5	**35.0**	16.51	**1.57**	20.0	**4.14**	1.44	**23**	22	**1.52**	0.91	**24**		
2	5 : 7	**35.7**	16.58	**1.57**	20.0	**4.19**	1.48	**22**	23	**1.62**	0.95	**24**	129	**90**
	6 : 7	**42.8**	16.44	**1.93**	25.0	**4.39**	1.87	**25**	22	**1.71**	0.97	**23**		
3	7 : 9	**51.2**	16.50	**2.27**	29.0	**4.46**	2.26	**27**	23	**1.89**	1.00	**23**	148	**120**
	8 : 11	**57.5**	16.58	**2.49**	32.0	**4.42**	2.52	**30**	23	**1.92**	1.01	**23**		
4	9 : 12	**66.7**	16.65	**2.84**	36.0	**4.40**	2.91	**31**	23	**2.15**	1.03	**23**	161	**150**

VE measured in litres per minute Stpd

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RESPONSE to EXERCISE DATA

T	Exercise time shown in minutes and seconds. At the end of the report interval you will probably notice a 'time slippage'. The reason is that all timings are tied to the breathing cycle, and if for example the 60-second period should occur during exhalation, the breathing cycle will be allowed to complete. The final time might be say 1 min 2 secs, however the actual exercise data will be adjusted to the minute value.
Ev	Event Marker. These are markers, which can be inserted either manually or automatically. They are normally used to indicate an event such as steady state or an increase in workload. If you wish to print an exercise prescription, you must insert at least 3 events during the exercise period and enter the heart rate at each event. Events are normally inserted every 2 or three minutes.
VE	Pulmonary Ventilation shown in litres per minute. Pulmonary ventilation can be expressed in either ATP (ambient temperature and pressure) BTPS (body temperature ambient pressure, saturated with water) STPD (standard temperature and pressure, dry). VE is measured breath by breath during the report interval and shown as ATP. At the end of the measuring period VE is converted to STPD. If you observe the readings you will notice that the STPD conversion produces a value that is less than at ATP. This does not affect VO2. Alternatively VE can be expressed as BTPS. This conversion produces a value greater than at ATP. Here again VO2 is not affected. Most commonly VE is expressed in STPD.
$\%O_2$	This is the percentage of oxygen in the expired air. As exercise becomes more intense, this percentage will reduce (indicating greater oxygen extraction). Values around 15% - 16% can be expected, although values below 15% are not unusual. As exhaustion approaches you will probably observe that the percentage of oxygen starts to increase (indicating less oxygen extraction). COVOX System software assumes ambient oxygen ie. the percentage of oxygen in inspired air, to be 20.93%. Oxygen extraction therefore is 20.93% minus the- percentage of oxygen in expired air.
VO_2	Oxygen consumption measured in litres per minute.
VO_2bw	Oxygen consumption divided by body weight expressed as ml per kilogram.
$\%CO_2$	The percentage of carbon dioxide in the expired air.As exercise becomes more intense, this
VCO_2	Carbon dioxide production measured in litres per minute.
RR	Respiration Rate or breaths per minute.
RER	**RER** / **CHO%** / **FATS** 0.71 / 0.00 / 100 0.75 / 15.6 / 84.4 0.80 / 33.4 / 66.6 0.85 / 50.7 / 49.3 0.90 / 67.5 / 32.5 0.95 / 84.0 / 16.0 1.00 / 100 / 0 **Respiratory Exchange Ratio.** Calculated by dividing VCO_2 by VO_2. This will range from around 0.75 at rest or very light exercise to around 1.2 at exhaustion. The food mixture being oxidised can be determined from the table shown left.
VeO	Ventilatory Equivalent for Oxygen. This is the ratio between the volume of air ventilated (VE) and the amount of oxygen consumed, (VE/VO_2) and indicates breathing economy. This value changes very little over a wide range of exercise levels, but will usually increase as exercise intensity approaches maximum.
VcO	Ventilatory Equivalent for Carbon Dioxide. This is the ratio between the volume of air ventilated (VE) and the amount of carbon dioxide produced (VE/VCO_2). The Ventilatory Equivalent for Carbon Dioxide remains relatively constant throughout the exercise range. NOTE: a criterion for estimating the anaerobic threshold is the start of a continued increase in VeO, without a similar increase in VcO.
HR	Heart Rate in beats per minute.