

The Indoor Rowing Marathon Plan

By

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1. Introduction
2. Demands of Marathon Rowing
3. Marathon Training Plan
 - 3.1 The 12 Week Marathon Plan
 - 3.2 Recovery
 - 3.3 Diet
 - 3.4 Hydration
 - 3.5 Heart Rate/Maximum Heart Rate Test
4. Mental Preparation
5. The Marathon Row

1. Introduction

This is not a Plan for beginners. If you are new to indoor rowing you will need longer than 12 weeks to prepare for a marathon row. The marathon is 42,195 metres a distance not for the ill prepared. If preparing to row a marathon from scratch have a look at the Concept 2 Indoor Rowing training Guide – www.concept2.co.uk

This is a Plan for established indoor rowers who train for 2000 m races or time trails over 5000 m, 10,000 m and the half marathon (21,097 m). The marathon plan in this guide assumes a high level of basic fitness and should not be attempted if you have been ill or injured recently. If in doubt consult your Doctor before you commence any marathon training.

The plan is based on successful British record breaking half marathon and marathon rows by Anna Bailey (50-59 hwt) and Anne Yates (50-59 lwt), a British marathon record by Alex Brown (50-59 hwt) and a personal best by Mark Whyman (40-49 hwt). It has also been used in part by a number of indoor rowers as base endurance preparation prior to more specific 2000 m training.

It is possible to row the marathon distance without undertaking a specific marathon training plan if you are an active 2000 m rower. The base endurance you have built up will see you through if you take it easy (50-60% of 2000 m power in watts). Your body will not like it, recovery will take many weeks and you will not produce the best performance you are capable of.

If you want to optimise your marathon performance (60-70% of 2000 m power in watts – closer to 65% or slightly below for the majority) then more specific marathon training is needed. Even if you are well trained the physiological stress on the body of a marathon row is high and recovery again is measured in weeks.

Note:

All you need to know to get started on this plan is:

- Your current 2000 m time
- Your maximum heart rate

And you will row about one million metres of a 12 week period

I will avoid using training zone terminology where possible – terms such as lactate threshold, aerobic, anaerobic are much debated, disputed and misunderstood terms. The aim of this Guide is not to explain the terminology or science but to offer a realistic marathon training plan that a well trained 2000 m rower can follow. Obviously some explanations are necessary but these are kept to a minimum.

Suffice to say that a marathon is almost totally an aerobic activity in the conventional sense although the physiological stress incurred by the body when rowing a marathon merits more than an aerobic activity description.

Whilst training is an individual physiological, psychological and environmental state for the sake of clarity I have standardised the training sessions using a heart rate range and pace per 500m range to make the plan accessible to all. The heart rate and pace ranges have been compiled from data obtained over a number of years from rowers who have followed the plan.

One by-product of marathon training is that it may improve your 2000 m personal best – marathon training is ideal for boosting that all important base endurance capacity so necessary to row a fast 2000 m time.

My thanks go to Anna Bailey, Anne Yates, Alex Brown and Mark Whyman who have permitted use of their training and race data and to Stu McSorley for writing Section 4 – Mental Preparation for a Marathon Row.

You are recommended to read the whole Guide before embarking on your marathon training – in particular make sure you understand the guidance on training by heart rate and the issues on recovery

About the author:

Eddie Fletcher is a sport and exercise physiologist and specialist indoor rowing coach. He is Coach to a number of World and British Indoor rowing champions and record holders.

About Stu McSorley:

Stu has been a competitive athlete for 25 years at triathlon, duathlon, swimming, cross country and road running. He was Florida Masters lightweight indoor rowing Champion in 2004 and 2005 and is mental preparation Coach to several National and World champions in Triathlon and Rowing.

2. Demands of a Rowing Marathon

Rowing a marathon represents an outstanding achievement for any rower. The combination of duration and pace requires a steady heart rate and oxygen consumption that exceeds the aerobic capacity of normal individuals.

Note:

To row a 'fast' marathon you will need to sustain:

- 75%-85% of your maximal oxygen uptake
- with your average heart rate close to 90% of your maximum
- and pace per 500 m in the range 60-70% of your 2000 m power in watts.

Note:

To appreciate how difficult maintaining 75%-85% of maximum oxygen uptake is consider the following scale.

This scale generally describes the intensity of exercise as a percentage of maximum oxygen uptake.

< 30% - daily physical activities, very light aerobic training

< 50% - light to moderate pace, basic endurance training

< 75% - moderate to hard pace, very hard endurance training

> 75% - very hard VO₂max training

A marathon is 'very hard' and demands a high level of aerobic fitness. You will be operating on the very edge of what is physiologically possible. It is therefore important to improve your aerobic fitness and maximum oxygen uptake to their optimum before attempting the marathon distance. The training plan in this Guide is designed to make physiological changes to the parts of your body that limit maximum oxygen uptake so that you will be better equipped to row an effective marathon.

Aerobic and maximum oxygen uptake training makes your heart get bigger. The result is an increase in the blood that you pump each beat and therefore the amount of blood pumped per minute. This means that your heart has to beat fewer times to move the same amount of blood and your resting heart rate will reduce.

Additionally your lungs become more efficient. More air is taken in per breath and breaths per minute are decreased.

The increased blood volume – due to increased blood plasma and red blood cell volume – means that your muscles become more efficient due to the increased ability to transport oxygen.

Developing your aerobic ability and improving your maximum oxygen uptake requires a very structured and periodised approach to training. There is a need to do sufficient work to make the training adaptations required by progressively increasing the training load in terms of duration and intensity. It is also important to ensure sufficient recovery between each session.

Note:

About Maximal Oxygen Uptake (VO_{2max})

Heart rate indicates the transfer of blood and oxygen to muscles.

Oxygen consumption indicates how the muscles use the oxygen for work and increases in a linear manner as exertion increases and is considered to be the most reliable variable to estimate rowing intensity.

Oxygen consumption is directly dependent on the amount of work your body does. The region in which oxygen consumption plateaus or increases only slightly with additional increases in exercise intensity represents the maximal oxygen consumption (or uptake)

Maximal oxygen uptake is a personal value, affected by your training history and genes. A common misconception is that maximum oxygen uptake directly describes a rower's performance level.

Performance is determined by how close to the maximum level a rower is able to maintain performance throughout a rowing session and by the economy of the performance. Economy means how much of the oxygen consumed by the rower's body converts into performance.

Oxygen consumption remains more or less the same or slightly decreases for a set standard rowing session, while maximal oxygen uptake may increase as rowing fitness improves.

Absolute maximum oxygen uptake is measured in litres, Often it is quoted as millilitres per kilogram of body weight per minute (ml/kg/min). Absolute maximal oxygen uptake is the more appropriate measure for rowing.

Below are shown the basic statistics from four recent marathon rows. A more detailed breakdown of each one is shown on pages 38-44.

Remember the guidelines:

- % of 2000m power in watts = 60%-70%
- maximum oxygen uptake (VO₂max) range = 75%-85%
- average heart rate = up to 90%

Anna Bailey

Marathon Time hr:min:sec	Ave. Pace min:sec	Ave. 2000m Watts (%)	VO ₂ max Range (%)	Ave. Heart Rate (bpm)	% Max Heart Rate
2:53:16	2:03.2	65	n/a	153	90

Anne Yates

Marathon Time hr:min:sec	Ave. Pace min:sec	Ave. 2000m Watts (%)	VO ₂ max Range (%)	Ave. Heart Rate (bpm)	% Max Heart Rate
3:10:50	2:15.6	68	77-81	158	89

Alex Brown

Marathon Time hr:min:sec	Ave. Pace min:sec	Ave. 2000m Watts (%)	VO ₂ max Range (%)	Ave. Heart Rate (bpm)	% Max Heart Rate
2:41:07	1:54.5	63	79-85	149	89

Mark Whyman

Marathon Time hr:min:sec	Ave. Pace min:sec	Ave. 2000m Watts (%)	VO ₂ max Range (%)	Ave. Heart Rate (bpm)	% Max Heart Rate
2:37:29	1:51.9	67	74-83	152	88

3. Marathon Training Plan

3.1 The 12 week marathon plan

The plan calls for up to 22.75 hours of rowing training every 4 weeks the intensity sequence is light, medium, hard, light for each 4 week period repeated 3 times to make 12 weeks in total. There is then a 2 week taper period before you attempt your marathon row.

You will spend 50% of your training time at marathon pace, 10% at half marathon pace, 25% at 10,000 m pace and 15% at 5000 m pace. Average pace per 500 m will be equivalent to 65% to 70% of your 2000 m power in watts. There is an option of a 5, 4 or 3 session per week.

If your 2000 m time is faster than 7:00 minutes you will row approximately 1,000,000 m plus (up to 1,100,000 m for a 6:00 2000 m rower). If your 2000 m time is slower than 7:00 minutes you will row less than 1,000,000 m (down to 900,000 m for an 8:00 minute 2000 m rower).

You only need to know two things to use this plan:

- Your current 2000 m time
- Your maximum heart rate

Note:

Do not automatically choose your personal best 2000 m time. For training purposes take a realistic view of your current performance level and choose a 2000 m time that reflects your current fitness. Always err on the side of caution in deciding the pace (s) to be adopted for any of the training segments.

DO NOT GUESS YOUR MAXIMUM HEART RATE USE ONE OF THE HEART RATE TESTS IN SECTION 3.3 TO OBTAIN YOUR PERSONAL VALUE. BEAR IN MIND THIS IS A PLAN FOR ESTABLISHED 2000 M ROWERS – KNOWING YOUR MAXIMUM HEART RATE IS IMPORTANT.

Then use the tables (pages 32 to 37) to establish your heart rate, stroke rate and training pace ranges for the marathon, half marathon, 10,000 m and 5000 m segments of each session.

For completeness the training paces are based on the following percentages of 2000 m power in watts – exercise caution when choosing your training pace.

Training Pace	Default Pace	Marathon	Half marathon	10,000 m	5000 m
% of 2000 m power (watts)	55%	60-65	65-70	70-75	75-80

Note:

REST DAYS ARE COMPULSORY.

The 5 session plan calls for a rest day after session 3 every week and another rest day after session 5. There is also the option of 4 sessions per week - 2 sessions then a day of rest 2 more sessions and then 2 days rest and also 3 sessions per week (with a 30 minute recovery row).

Do not hesitate to take extra rest days if you feel you have not recovered from a prior session. It is also sensible to miss the occasional session if it aids recovery. On the 5 session plan session 5 is always optional and ideally should be rowed at 75% or less of HR

Do not train if ill or injured and when you start training again always go back to week 1 sessions for a few days reducing your heart for the session by 5% (e.g. 80% down to 75% etc.) with a corresponding reduction in pace.

Note:

The training paces do not necessarily reflect the pace you would use if rowing a 5000 m, 10,000 m or half marathon time trial.

They are simply there as a guide to training paces for purposes of the plan. When using the pace tables always start off at the lower end of the pace range.

It is acceptable to split the sessions with short rest intervals. It does not detract from the overall effectiveness of the training session to take these short rests.

The overriding consideration is heart rate

Note:

If your heart rate reaches the top end of the heart rate range shown for a session you should reduce the pace to match the heart rate.

DO NOT EXCEED THE UPPER LIMIT OF THE HEART RATE RANGE FOR EACH OF THE SUGGESTED TRAINING SEGMENTS

The training pace table includes a default marathon pace equivalent to 55% of 2000 m power in watts. Whenever your heart reaches the upper limit you should reduce your pace to this default level until your heart rate recovers – fix your default pace in your mind.

IF YOUR HEART RATE REMAINS TOO HIGH SLOW THE PACE DOWN UNTIL YOUR HR REDUCES TO AND THEN WORK STRICTLY WITHIN THE HR RANGE FOR THE SESSION IRRESPECTIVE OF THE PACE THIS PRODUCES

Stroke rate is also important

Note:

Keep within the stroke rates shown for each segment – the lower end of the stroke rate range is preferable. The stroke rate range reflects different rowing styles and individual physical and physiological factors but for any individual training segment you should not exceed the upper stroke rate limit.

Hydration – A reminder

Heart rate rises due to number of reasons. One of the prime causes is dehydration. It is important to remain well hydrated so drink every 10 to 15 minutes. Take time to practice your drinks strategy for the full marathon row to come.

Do not under estimate the effects of heat and humidity on both your heart rate and hydration status

Drag – A reminder

Always set the drag exactly the same for every training session on the plan. As a general guideline drag should be set at:

Male hwt – 125-140
Female hwt – 120-135
Male lwt – 120-135
Female lwt – 115-125

For a full explanation of drag see the Concept 2 Indoor Rowing Guide.

Technique – A reminder

Good technique is the ability to convert potential into performance. The more efficient your technique the better your performance will be.

This Guide assumes you are an established indoor rower but constant review of your technique is important. Maintaining technique over long duration, every stroke is not easy but will help to optimise your performance.

This is not a Guide on technique; you should review your technique by obtaining a copy of the Concept 2 technique DVD and reviewing the description of technique in the Concept 2 Indoor Rowing Training Guide.

A training example

Current 2000 m time 7:00, Maximum heart rate 180, Drag 130

4 sessions per week plan - Session 1, Week 1

60'
(2 x 30' 3'rest)

Alternate
7.5' @10KP
7.5' @ MP

HR 80% -90% max

7.5' at 10,000 pace of 1:55.5 to 1:58.0 pace per 500 m at stroke rate of 24-26 followed by 7.5' at marathon pace of 2:01.0 to 2:04.5 pace per 500 m at stroke rate of 20-22 = 15' of work repeated twice = 30'

then

3' rest and repeat

7.5' at 10,000 pace of 1:55.5 to 1:58.0 pace per 500 m at stroke rate of 24-26 followed by 7.5' at marathon pace of 2:01.0 to 2:04.5 pace per 500 m at stroke rate of 20-22 = 15' of work repeated twice = 30'

Total rowing time 60'

Heart rate between 144 to 162 – whole session limited by heart rate

WITHIN EACH TRAINING SEGMENT ROW AS EVEN PACED AS YOU CAN
WITHIN THE HEART RATE RANGE

A practical training example

Alex Brown – Assumed 6.36 2000 m time (personal best is 6:33) and 168, maximum heart rate, drag 135

4 x 15' – 4' rest

Alternate

6' @ 5KP

9' @ MP

HR 85%-92.5% max

Pace guide for this session 5KP = 1:46.5 to 1:49.0 strokes 26-28

MP = 1:54.5 to 1:57.5 strokes 20-22

Heart rate = 143 to 155

Session	Average pace	Average Stroke rate	MaxHR
6'	9'		
1:45.4	1:54.5	1:50.9	24
1:46.0	1:54.4	1:51.1	24
1:45.7	1:54.4	1:50.9	26
1:45.6	1:54.4	1:50.9	26

Alex comfortably matched all the session criteria

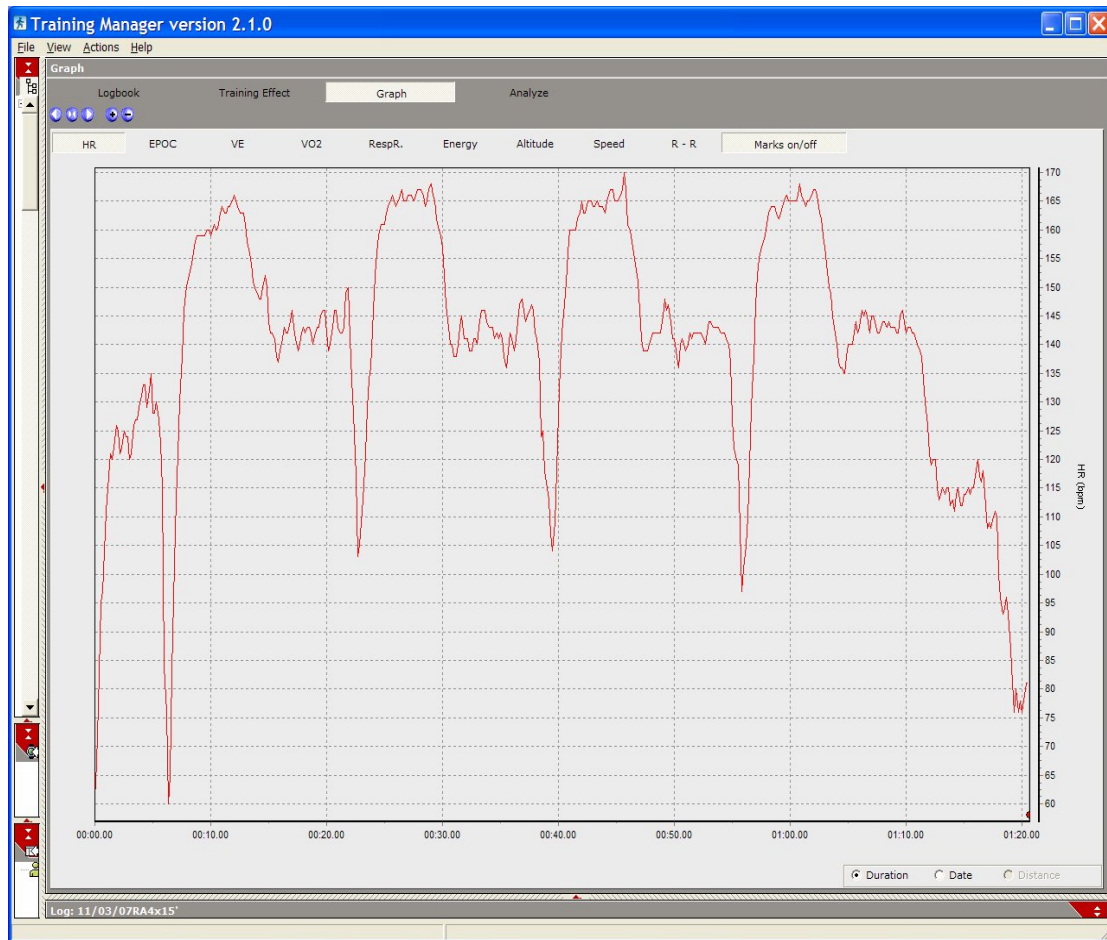
NOTE:

A comment from Anne Yates when doing the same session

'I slowed down within each 15 mins if HR went over 160 (90%) and then I picked up the pace again when HR reduced'

A reminder that heart rate is the deciding control over the session

The heart rate shape of the 4 x 15 minute session – Rower Rachel Armstrong



4 x 15 mins 90 secs

6' at 2.03 – stroke rate 26-28 then 9 mins at 2.13 – stroke rate 18

HR cap 166 for 2.03 pace and 142 for 2.13 pace

Pace per 15 minutes

Metres	Pace
3470	2:09.6
3415	2:11.7
3408	2:12.0
3412	2:11.8

3.2 Recovery

‘You can only train as hard as you can rest’ Tom Kay – 3 times World Rowing Champion

Well timed rest is one of the most important factors of your training. The effect of training sessions on your fitness can be negligible or even detrimental if you do not include sufficient rest, recovery and periodisation into your training programme.

Your body needs time for recovery after a single high intensity session or a hard training period of several days or even after a low intensity but long rowing session. Without rest your body's adaption to the training stimulus will not occur. In the worst case training will lead to exhaustion and a state of overstress otherwise known as 'overtraining' or under recovery.

Continuous hard training with insufficient recovery will slowly lead to lower performance and a long term state of overtraining. When overtrained even a long period of recovery may not be enough to return performance to the original level.

Recovery from a 2000 m race may take up to 7 days whilst at the other end of the scale it may take 8-12 weeks to recovery from a rowing marathon. Once you have rowed your marathon give yourself plenty of rest and recuperation time.

Note:

REST DAYS ARE COMPULSORY.

The 5 session plan calls for a rest day after session 3 every week and another rest day after session 5. There is also the option of 4 sessions per week 2 sessions then a day of rest 2 more sessions and then 2 days rest and 3 sessions per week (with a 30 minute recovery row).

Do not hesitate to take extra rest days if you feel you have not recovered from a prior session. It is also sensible to miss the occasional session if it aids recovery. On the 5 session plan session 5 is always optional and ideally should be rowed at 75% or less of HR

Do not train if ill or injured and when you start training again always go back to week 1 sessions for a few days reducing your heart for the session by 5% (e.g. 80% down to 75% etc.) with a corresponding reduction in pace.

3.3 Diet

To maintain weight and ensure you have the right energy levels you must have an idea of your daily calorie requirement – there is a fine balance between the calories consumed and the calories expended. Knowing your daily energy costs is an important part of your marathon training preparation.

Energy costs can be divided into three main groups, the basal metabolic rate, (BMR) which is solely the cost of running your life support system, heart, lungs, digestion etc. Daily expenditure, which is what you do when awake up and about and finally the energy costs of training.

You can find out your BMR, and all the other calculations in this Guide, from the Concept 2 [BMR Calculator](#).

Below is a worked example for a marathon session as well as advice on why knowing your BMR is useful, and how you can use it to maintain a correct calorie balance between the three main food groups.

BMR is related to age and gender (with women holding a proportionally higher level of fat and less muscle tissues than men). Muscle tissue is metabolically more active than fat tissue and therefore requires more energy to maintain. To calculate your BMR by hand, you need the following formulas:

Age	BMR (males)	BMR (females)
10-17	$17.7W+657$	$13.4W+692$
18-29	$15.1W+692$	$14.8W+487$
30-59	$11.5W+873$	$8.3W+846$
60-74	$11.9W+700$	$9.2W+687$
75+	$8.4W+821$	$9.8W+624$

W = Bodyweight (kg)

As an example: 55 year old male (Alex Brown) who weighs 96 kgs.

His BMR is 1977 kCals ($11.5 \times 96 + 873$).

To estimate your average daily expenditure you need to take your BMR and multiply it by a factor, which is determined by your activity level. If we assume that Alex in our example is very active during the day then the factor is 2.0, so the BMR is doubled to 3954 kCals to give the estimated daily expenditure.

If he follows this with a day of relaxation where he is mainly sedentary, mostly seated or just standing then the factor is 1.4, so his energy expenditure falls to 2768 kCals.

On another day if he is moderately active with regular brisk walking or manual work then the factor is 1.7 and the energy cost rises to 3360 kCals.

To determine the cost of training we have to find the hourly BMR, which is done by simply dividing your BMR by 24. If we use the BMR in for Alex then the hourly BMR is:

$$1977 / 24 = 82.3$$

For the different rowing intensities there is a Physical Activity Ratio (PAR) and to find the energy costs of training the formula is, hourly BMR x PAR x Duration.

Pace	Watts	PAR	Pace	Watts	PAR	Pace	Watts	PAR	Pace	Watts	PAR
1:30	480	33.6	1:45	302	21.0	2:00	203	14.2	2:15	142	9.9
1:31	464	32.5	1:46	294	20.5	2:01	198	13.9	2:16	139	9.7
1:32	449	31.4	1:47	286	20.0	2:02	193	13.5	2:17	137	9.6
1:33	435	30.4	1:48	278	19.5	2:03	188	13.0	2:18	134	9.4
1:34	421	29.5	1:49	270	18.9	2:04	184	12.9	2:19	131	9.2
1:35	408	28.5	1:50	263	18.4	2:05	179	12.5	2:20	128	9.0
1:36	395	27.6	1:51	256	17.9	2:06	175	12.2	2:21	125	8.7
1:37	383	26.8	1:52	249	17.4	2:07	171	12.0	2:22	123	8.6
1:38	372	26.0	1:53	243	17.0	2:08	167	11.7	2:23	120	8.4
1:39	358	25.0	1:54	236	16.5	2:09	163	11.4	2:24	117	8.2
1:40	350	24.5	1:55	230	16.0	2:10	159	11.1	2:25	115	8.0
1:41	340	23.8	1:56	224	15.6	2:11	156	10.9	2:26	112	7.8
1:42	330	23.0	1:57	219	15.3	2:12	152	10.6	2:27	109	7.6
1:43	320	22.4	1:58	213	14.9	2:13	149	10.4	2:28	107	7.5
1:44	311	21.7	1:59	208	14.5	2:14	145	10.1	2:29	105	7.4

Continuing to use the Alex as an example, the energy cost for some typical marathon training sessions are:

Assume 6.36 55 year old 2000 m performer:

$$60 \text{ minutes @ } 1:54 \text{ marathon pace} = 82.3 \times 16.5 \times 1.00 = 1358 \text{ kCals}$$

$$80 \text{ minutes @ } 1:54 \text{ marathon pace} = 82.3 \times 16.5 \times 1.33 = 1806 \text{ kCals}$$

$$90 \text{ minutes @ } 1:54 \text{ marathon pace} = 82.3 \times 16.5 \times 1.50 = 2037 \text{ kCals}$$

So if Alex carries out a 60 minute session at a 1:54 pace on an active day the total energy costs is just over 5300 kCals (1977 x 2 + 1358).

To embark on a marathon with no idea of your daily calorie requirement is not only a waste of time but can present a health risk. Many diets seem to pluck a total daily calorie requirement out of the air and it is not unusual to see a figure of 1,000 calories for women. In this worked example two things are apparent: the

difference from day to day and that his BMR is over 1,977 kCalories.

To lose weight it is necessary to take in fewer calories than you expend but it should not fall below your BMR. If it does then your body goes into "famine mode."

In this condition it is not necessarily fat that is lost faster but lean body mass and water, and the metabolism slows down to balance the reduced calorie intake. The consequence is loss of strength, lack of energy, mood swings, tiredness, sluggishness, not to mention hunger. Your immune system will also be affected and you will become vulnerable to infection.

Note:

If you embark on this marathon plan it is strongly recommended that you do not do so at the same time as trying to lose weight.

The other aspect is to know the calorie balance.

Energy will be provided by three food groups, carbohydrates, protein and fats. The relative balance between these groups is 60% carbohydrates, 17% protein and 23% fats.

Going back to our example of Alex, on the day where the energy expenditure is 3954 kCals his estimated dietary requirement is 593g of carbohydrate, 101g of fat and 168g of protein. This is because each gram of carbohydrate and protein will provide 4.3 kCals while fat provides 9 kCals. This entire math is worked out for you in the Concept 2 [BMR Calculator](#).

Energy expenditure during a marathon row

For Alex Brown his marathon record row was 2 hours 41 minutes 07 seconds
– energy consumption was therefore just over 3600 kCals:

Hourly rate x Physical Activity Ratio x Duration

$$82.3 \times 16.5 \times 2.68 = 3639 \text{ kCals}$$

Carbohydrate intake required during and after training and the marathon row

Note:

One hour of rowing on the marathon plan will reduce liver glycogen by over 50% - 2 hours of rowing will deplete all of the glycogen content of the liver and active muscles.

Before each training session a small amount of low (apples/butter-navy-kidney beans/lentils) to moderate (white pasta/oatmeal/All-bran/peas) glycemic food should be eaten to provide energy at the right time.

Consuming 60g of liquid or solid carbohydrates each hour during your marathon training sessions will help to postpone fatigue.

A single concentrated carbohydrate feed about 30 minutes before anticipated fatigue (generally about 2 hours into a marathon row) is as effective as periodic carbohydrate feeding.

Immediately after training or the marathon row you need to replenish your body with a small amount of high (/oranges/white rice/corn flakes/new potatoes) glycemic food and within 2 hours a moderate glycemic food meal should be eaten.

3.4 Hydration

Note:

Almost any dehydration impairs performance - For each litre of sweat loss dehydration, rowing heart rate will increase by approximately 8 beats, and this will significantly reduce performance if the body is not continually re-hydrated.

The loss of water represents the most serious consequence of profuse sweating. Intensity and duration of exercise, external temperature and humidity determine the amount of water lost through sweating. Water loss (dehydration) can seriously impair your training or marathon performance so careful attention to drinking strategy is important.

Fluid loss from the vascular compartment places a significant strain on circulatory function which ultimately impairs training performance and thermoregulation of the body.

Therefore taking on fluid before and during training will reduce the detrimental effects of dehydration on performance. Adding carbohydrates to your fluids will provide additional glucose energy (in the words of Anne Yates 'adding salt and sugar to water so it tastes a bit like tears'). Determining the optimal fluid/carbohydrate mixture and volume becomes important to minimise fatigue and dehydration.

Note:

The body needs liquid intake on sedentary days of approximately 2.5 litres of water which it draws from food (0.8 L), stores (0.5 L) and direct liquid intake (1.2 L). On active days you may need much more 2-4 litres so remember to remain well hydrated.

Keeping a check on your body weight is a useful indicator of fluid loss every 0.45 kg of body weight lost is equivalent to 0.45 L of dehydration.

It is important to continually replace liquid throughout the normal day and during training – when training try to get into a regular habit of drinking every 10-15 minutes.

Consuming 0.4-0.6 L of fluid immediately before training and drinking 0.15-0.25 L every 15 minutes during training (and during your marathon row) will optimise the beneficial effects of fluid intake. Fluid delivery of about 1L per hour should meet the needs of marathon rowers.

3.5 Heart Rate/Maximum Heart Rate Test

The plan uses percentage of maximum heart rate to control the intensity of any session so getting an accurate value is important.

Maximum heart rate is the highest possible heart rate your heart can achieve. There are a number of formulae to calculate your maximum heart rate based on your age. However actual maximum heart rate may vary as much as 20-30 beats from a calculated value.

An indoor rowing specific test is the only realistic way of assessing this value.

Remember that maximum heart tests are extremely demanding and should only be attempted by experienced competitive indoor rowers.

In order to achieve accurate results the same pre-test protocol should be carried out before you undertake any of the tests. This should include:

- Being in good health.
- Being well rested with no heavy training sessions in the last 48 hours.
- No alcohol consumed within the last 24 hours.
- No strong coffee or tea in the previous three to four hours.

Two alternative maximum heart rate tests are shown below.

TEST ONE:

This test has a dual purpose and can be used to determine maximum heart rate and a 2000m predicted time.

For any given load, there is an energy cost known as the metabolic equivalent, measured in METs. An increase of 25 watts on the Indoor Rower is approximately equivalent to one MET and will bring about an increase in oxygen consumption of 3.5ml/kg/min.

Table 1

Model C, D 500m Pace/Watts Conversion Table								
500m	4:01.0	3:11.3	2:47.1	2:31.8	2:20.9	2:12.6	2:06.0	2:00.5
Watts	25	50	75	100	125	150	175	200
500m	1:55.9	1:51.9	1:48.4	1:45.3	1:42.5	1:40.0	1:37.7	1:35.6
Watts	225	250	275	300	325	350	375	400
500m	1:33.7	1:32.0	1:30.3	1:28.8	1:27.4	1:26.0	1:24.7	1:23.6
Watts	425	450	475	500	525	550	575	600

The steps used for this test are displayed in Table 1 above in terms of Pace/500m and approximately relate to 25 watt - 1 MET increment. The test consists of five four minute pieces, each rowed at a consistent 500m pace.

The first four minute step should be set at a level which will allow you to complete the four minutes comfortably with no signs of distress. Rest for 30 seconds between each step. Note: if the monitor is set for four minutes work and 30 seconds rest, all information is stored for recording at the end of the test in the Concept 2 Indoor Rower Performance Monitor.

During each step, the heart rate will rise, but should stabilise after around three minutes.

Note:

How to Select Steps for the Step Test one

To determine the appropriate start level, you will need to know your current 2,000m time. Using Table 1, select the nearest step to your 500m split time for 2,000m.

To determine Step 1, count back six steps. After rowing 4 minutes at Step 1 move up to the next step, and so on, until Step 5 this should be performed flat out to elicit a predicted 2,000m time and your maximum heart rate.

If your 2,000m time is slower than 9:30 you must select 4:01 as your Step 1 as this is the lowest starting point for the Step Test.

The following is an example of an indoor rower who rows 2,000m in 6:40. Average 500m split = 1:40. Starting level (Step 1) is six steps back = 2:00.5 Step 2 = 1:55.9 Step 3 = 1:51.9. Step 4 = 1:48.4 Step 5 is done flat out to give a predicted 2,000m time and maximum heart rate.

For practical purposes the pace for each step should be rounded to the nearest second.

TEST TWO

The test consists of seven four minute pieces, each rowed at a consistent 500m pace.

The first four minute step should be set at a level which will allow you to complete the four minutes comfortably with no signs of distress. Rest for 60 seconds between each step. Note: if the monitor is set for four minutes work and 60 seconds rest, all information is stored for recording at the end of the test in the Concept 2 Indoor Rower Performance Monitor.

During each step, the heart rate will rise, but should stabilise after around three minutes.

Note:

How to Select Steps for the Step Test two

To determine the appropriate start level, you will need to know your current 2,000m time. Divide your 2000m time by four to establish 500m split time.

To determine your Step 1 add 4 seconds to your 500m pace and then from this pace add successive amounts of 6 seconds counting back six steps. After rowing 4 minutes at Step 1 move up to the next step, and so on, until Step 7. This stage should be performed flat out to elicit your maximum heart rate.

The following is an example of an indoor rower who rows 2,000m in 6:40. Average 500m split = 1:40 add 4 seconds = 1.44.

Add successive 6 seconds –

Step 1 – 2:14, Step 2 – 2:08, Step 3 – 2:02, Step 4 – 1:56, Step 5 – 1:50, Step 6 – 1:44, Step 7 – flat out

4. Mental Preparation for a Marathon Row.

"I'm motivated by the internal desire to test my limitations in the world. To truly find out what I'm capable of I must know my limitations. It never ceases to surprise me that my limitations are well beyond what I thought"

Elite triathlete - Jim Vance

The marathon will explore every aspect of your physical and mental limitations. Your mind will play games during the row and the 'Demons of Doubt' will rear their ugly head.

So how do we overcome these 'Demons of Doubt'?

Stu McSorley offers some simple tips to help:

- Set your goals
- Be well prepared
- Maintain focus
- Be positive
- Develop routine and understanding
- Break it down
- Maintain good mental habits

Set your goals

This is the simplest of all mental tools and one that will contribute the most toward motivation. Goals should be manageable and most of all achievable. Having set your marathon and training goals select the training plan that will help you to achieve them. Knowing where you are going and how you will get there will breed discipline and confidence.

Be well prepared

Put in a solid, consistent and enthusiastic training session each day. This will register in your subconscious for future sessions and for the marathon row itself. Execute your training plan paying attention to the details of what you need to do that day. Avoid trying to micro manage each session by trying to fit it into a bigger picture. The most important session you will be doing is the one that day regardless of difficulty.

Maintain Focus

Focus on the task in hand and the mechanics of the stroke. Try to regularly project your thoughts during training toward the marathon day through visualization. By visualizing the exact result you want to achieve you will create a positive program within yourself.

Be Positive

Be positive 99.9% of the time. Be sure that your emotional state is always upbeat. Research has established that athletes who maintain a positive outlook react better to stress and focus well on their daily tasks. Always take a positive from every session regardless of the result.

Develop routine and understanding

Develop a repeatable routine, try to make at least one session per week a mini marathon rehearsal by doing the exact warm up, wearing the outfit you intend to wear for the marathon and using the same pre race nutrition that you will use on the day of the marathon. This familiarity will calm your nerves on marathon day.

Understand that the marathon row will be hard and at times very uncomfortable but reassure yourself constantly of how well you have prepared and build your confidence through the row with positive self talk. Use prompt words such as "strong" "relaxed" and "rhythm" to bring you back to the task at hand

Break it down

Break the marathon down into smaller chunks rather than focusing on the whole piece which can be very demoralizing. Perhaps you could break it into 8 x 5000 m and as each 5000 m ticks allow yourself a drink or some nutrition as a reward. Most of all remember that every stroke takes you closer to the target and the elation of achievement.

Maintain good mental habits

You can train your mind at 100% intensity all day. Good mental habits will be recorded in your mind much the same as a computer database for you to recall from memory at a later date. Your marathon result is created in the minutes; hours and days leading up to the race so make each day count.

5. The Marathon Row

If you have completed the whole training plan you will be well prepared to row a marathon. The question you need to ask yourself now is 'what heart rate, stroke rate and pace should I use for my marathon row?' Get it wrong and you will struggle, get it right and you will feel immense satisfaction when you finish your 42,195 m.

The key to rowing a good marathon is to keep the heart rate in a tight range, stroke rate low and the pace as even as possible – this is not only conserves energy but will delay the onset of fatigue and the inevitably heart drift and lactic acid build up.

Full analysis of the marathon rows by Anna Bailey, Anne Yates, Alex Brown and Mark Whyman are shown at the back of this Section. Note the even pace per 500 m maintained throughout the rows and the tight heart rate range with very little heart rate drift.

Note also that stroke rate starts low (20-21) and gradually increases as the row progresses. This is because as the body fatigues there is a need to compensate by increasing the stroke rate to hold both pace and heart rate at the right level. Although Anna Bailey was able to hold 20-22 strokes throughout the whole of her row she displayed significant upward heart rate drift as a consequence.

Unusually for a heavyweight man Alex was at 26/27 strokes for the second half of his row.

As a general rule lightweight men and women and moderately heavy women should be able to maintain a higher percentage of 2000 m power in watts for their marathon row. Heavyweight men and top end heavyweight women will generally have to use a lower percentage of their 2000 m power in watts due to the disadvantage of weight, height and stroke length particularly in relation to the amount of energy needed to move the body up and down the slide every stroke.

Note:

'What percentage of my maximum heart rate should I use?'

Look again at your training performance – were you able to keep within the general heart rate guidelines.

Set off cautiously keep your heart rate in the range 85%-90% of maximum. Row the first half marathon well under 90% and control the pace by heart rate.

You will not be able to row for long with your heart rate rising above 90% slow down if your heart rate is rising too much, better to slow down than not finish at all.

Note:

'What stroke rate should I use'

You will probably know this already from your training performance. If you are to meet the energy demands of a marathon you should row at 20-26 strokes. In the second half of the row your stroke rate will rise to cope with the physiological needs of the body and to maintain rowing pace.

Each rowing stroke requires energy just to move the body up and down the slide. The stroke rate/energy requirement is a curve so increasing the stroke rate from 24 to 28 takes more energy than increasing from 20-24. Taller and heavier rowers suffer more than lighter shorter rowers.

Be careful in your use of stroke rate to maintain the pace, again better to slow down and contain the stroke rate than not to finish at all.

Note:

'At what pace should I row my marathon?'

Look at your training performance – what pace did you consistently row for the marathon pace segments of the plan and generally remain under 90% of your maximum heart rate.

This should be the pace you use for your marathon attempt. This will be between 60%-70% of your 2000 m power in watts and probably in the tighter range of 60%-65%. You should row your marathon as even paced as possible.

Be realistic about your training performance it is better to under estimate your marathon pace than to over estimate it and fail to complete your marathon attempt.

Note:

Hydration

Ensure you are well hydrated before you start. You should work out your drinks strategy before the marathon attempt. Consider what type of drinks you are going to use and how often you are going to drink.

Recommendation is that you drink every 10-15 minutes

Dehydration will severely limit your performance. If you become dehydrated your heart rate will rise quickly and it is unlikely you will finish.

Note:

Some practical issues

Get used to wearing the same type of clothing during training that you will use for your marathon row – if you normally wear gloves or use a padded seat use them for every session. On the day of the marathon row don't wear anything new.

Try to train in the same conditions and surroundings for all your training sessions and on the day of your marathon row don't change anything. Gather around you the things that motivate you – music, posters, mascots, friends, support crew.

Ensure your training and marathon location has adequate lighting, ventilation and heat control.

Prepare all your food and drink beforehand and make sure that your supporters know when to feed you.

Check the batteries in the Concept 2 monitor and replace them if necessary.

Make sure the machine is clean and don't forget to set the drag factor before you begin.

Set the monitor to 42,195 m ...

Study the marathon rows of Anne, Alex, Mark and Anna (pages 35-38) carefully and note the pace, heart rate and stroke rate development which allowed them to successfully complete their rows.

It wasn't all plain sailing for the marathon record breakers. Have a look at Anne's heart rate profile - close to 90% from the very start. At 36,000 m (4,195 m to go) note a sudden slowing of pace and fall in heart rate. Anne had 'hit the wall' nothing left, heart rate had been a fraction too high in the first half of the row – will power and mental strength kept her going. Fortunately Anne had over 8 minutes in hand to break the record and was able to row the last 6,195 m conservatively to finish seven minutes inside the old record time.

Anne describes the feeling

I was well prepared for this marathon attempt. I had followed the training plan and conditioned myself to long steady paced rowing which I believe is how a marathon should be rowed.

On the day I felt strong, I was well prepared mentally and physically. I was determined to break the record and wasn't going to let anything stop me. I soon settled into a steady pace and I was feeling great. At half way I was excited to think I had just broken the half marathon record time and that gave me a boost to keep rowing strong and steady for the second half.

I 'hit the wall' with 6k to go. It was like a switch had been turned off and although I increased my stroke rate to help maintain the steady pacing the power just wasn't in my legs anymore. It was sheer will power that saw me through the last 6k helped by the countdown on the monitor.

After the row it took a while for me to be able to stand up and walk around. I had really given it my all. I felt as though my body was floating. I found it hard to concentrate on any conversation and for the next hour I was moving in slow motion.

A good feed and drink helped. I didn't feel any stiffness in my body but the mental and physical effort left me very tired. A few days of good eating and rest soon made a difference.

On reflection I would say the success of my marathon row was a result of my level of fitness after following the marathon plan, being mentally and emotionally focused, keeping an even pace as much as possible throughout the row, being well hydrated and having the support of my coach and crew on the day.

Towards the end of Alex's marathon the pace showing on the monitor began to fluctuate. He had kept a solid 1:54-1:55 all the way and all of a sudden the monitor was showing 1:52 then a 2:00 back to 1:54 then 1:57 and so on. Alex was convinced it wasn't him, 'the monitor is faulty', and 'the battery is going' (he had checked it before he started).

In truth Alex was running out of energy, he had been increasing his stroke rate to maintain pace but had reached 26/27 and couldn't put any more strokes in. The pace began to vary as he couldn't maintain the even power per stroke.

Alex takes up the story

'The first two hours were comfortable the training had prepared me and this felt no more difficult than a training session. At around two hours feelings of confidence fluctuated with thoughts of the possibility of potential difficulties to come but with only 7K to go belief that the only question was by how much I would break the record.

The main problem was mental because I didn't understand what was happening; fatigue was affecting my performance before I could feel its effect.

After two hours of holding the splits consistently between 1:54 and 1:55 suddenly they started fluctuating between 1:52 and 2:00 in spite of my best attempts at even pace.

I felt that the batteries in the monitor were dying and that I might lose the display altogether and have to abandon the attempt. I started to really panic and lost the necessary focus on the task at hand.

By the time that the fatigue really started to bite I was ill prepared to face it and without some encouragement and severe admonishment would have given up and stopped. Fortunately the support that I received carried me through the worst moments and I regained the determination to hang on.

Things did stabilize to some extent the fluctuations diminishing but my confidence had been hit to such an extent that I didn't dare to make a serious attempt to pick up the pace until the last 300m to finish strongly.'

And finally ...

Anna Bailey – marathon and 100k record holder offers her wisdom:

If you decide to undertake a marathon row, you need to be sure that you are going to enjoy it! Otherwise, there seems little point. It requires a different mental approach and a high level of commitment. The training sessions, while not too painful, are of necessity longer and a bigger drain on your time. Personally I enjoy longer distances more than short sprints.

The training is very different from the usual race training, being marathon-specific in structure. I can honestly say that I was never bored during the sessions, with so much to monitor on the screen, breathing patterns to practise, and always with good music to listen to! The sessions are varied enough to keep interest going.

I was fortunate enough to have been able to take advantage of Eddie's tailor-made programmes for each of my two marathon and one 100k World Best rows. We learned a lot from the first marathon which we were able to use to good advantage in the second.

Why do you want to do a marathon? Motivation is crucial, whether it is for a personal best time, an attempt on a record, or merely to say that you have completed one. Additional incentive which will keep you going is perhaps to do it for charity, and certainly do it publicly, either with a group at the gym or even in a public place. Both my marathons took place in a city shopping centre, well shaded and ventilated. No way was I even thinking about failing in front of the Saturday morning shoppers! Choose your venue carefully.

I would advise a good carbohydrate meal the previous evening, nothing spicy which might upset the stomach, and eaten early enough to be able to have cleared your system (not to put too fine a point on it!) before you row. One less thing to worry about. On the morning, porridge and bananas are the order of the day, but not too close to row time. You probably will not need to eat during the row, particularly if you are using an energy drink.

The importance of hydration before and during the row is well covered in this guide. In my first marathon, I resolved to drink by the clock, whether I felt I wanted it or not. I used plastic cups set up on a low table within easy reach. They were filled with my usual energy drink, but diluted to half strength. However, I did find that I lost a little pace by pausing to drink, and so on the second occasion I used a floor-based container (e.g. Camelbak) with an extension tube pinned to my shirt so that I could drink at will. Result! You may have a supporter pass you a bottle or hold a tube for you if you prefer. Practise drinking during the longer training sessions. One way or another, DRINK!

Choice of clothing is also important. I wore shirts and leggings with good moisture-wicking properties. I also used special running socks which are double layered, to avoid friction. You will probably get “hot-spots” on your heels at the least. I always wear gloves for training and racing, which gives me a better grip and helps prevent blisters.

Avoid distraction during your row. It is maybe not so easy in public, but with the headphones on and my favourite music playing I was able to retreat into my own world and focus on the task, almost in meditation mode. I don't respond to exhortation during a row – I prefer the “horse-whispering” style of Eddie, which I use myself now. Some acknowledgement from your supporters as you pass major mile-stones (or should that be kilometre-stones?) can provide a lift.

You will already have decided on your pace, as described in the guide, and you will KNOW from your sessions that it is one which you can sustain for the duration. It is fixed in your head; you will focus on it and will not deviate. There may be times when you are tempted to accelerate, especially when you see a chink of light in the tunnel, frequently around the 10k remaining point. Don't even think about it until after the 5k mark. Even then, increase only in tiny amounts, falling back if it does not feel right. If it is going well, you might increase pace in equally small increments at important markers, e.g. 2k, 1k, 500m, etc. Note that it will not affect your overall time significantly, so you might want to save it for an impressive 100m flying finish! Even pace is best.

If you are lucky and the pace is just right, you can avoid hitting that wall. I never hit it during the marathons, only in the 100k, so count myself very lucky.

At the end of your row will come intense relief at having got it over with, and the pain starts when you try to get up! And again when you try to bend over! Be prepared for some digestive upset for the rest of the day too. On the plus side, you have just made a major achievement, and you have your life back! It was worth it.

The very best of luck!

The 12 Week Marathon Plan (5 Sessions)

Week/Day	1	2	3	4	5	6	7
A W1,5,9,	60' (2 x 30' 3' rest) Default MP or slower HR 75% -80% max	60' (4 x 15' 4' rest) Alternate 6' @ 5KP 9' @ MP HR 85% -92.5% max	60' (3 x 20' 2' rest) 20' each @ MP, 10KP, HMP HR 80% -90% max	REST	60' (4 x 15' '' rest) Alternate 6' @ 5KP 9' @ MP HR 85% -92.5% max	60' (2 x 30' 3' rest) Default MP or slower HR 75% max	REST
B W2,6,10	80' (2 x 40' 4' rest) Default MP or slower HR 75% -80% max	60' (4 x 15' 4' rest) Alternate 7' @ 5KP 8' @ MP HR 85% -92.5% max	80' (4 x 20' 2' rest) 20' each @ MP, 10KP, HMP, MP HR 80% -90% max	REST	60' (3 x 20' 5' rest) Alternate 7' @ 5KP 13' @MP HR 85% -92.5% max	80' (2 x 40' 4' rest) Default MP or slower HR 75% max	REST
C W3,7,11	90' (2 x 45' 4.5' rest) Default MP or slower HR 75% -80% max	60' (4 x 15' 4' rest) Alternate 9' @ 5KP 6' @ MP HR 85% -92.5% max	90' (3 x 30' 3' rest) Alternate 30' @ MP 30' @ 10KP 30' @ MP HR 80% -90% max	REST	75' (3 x 25' 5' rest) Alternate 8' @ 5KP 17' @MP HR 85% -92.5% max	90' (2 x 45' 4.5' rest) Default MP or slower HR 75% max	REST
D W4,8,12	60' (2 x 30' 3' rest) Default MP or slower HR 75% -80% max	60' (4 x 15' 4' rest) Alternate 6' @ 5KP 9' @ MP HR 85% -92.5% max	60' (3 x 20' 2' rest) 20' each @ MP, 10KP, HMP HR 80% -90% max	REST	60' (4 x 15' 4' rest) Alternate 6' @ 5KP 9' @ MP HR 85% -92.5% max	60' (2 x 30' 3' rest) Default MP or slower HR 75% max	REST

Sequence is: W1 W2 W3 W4 W5 W6 W7 W8 W9 W10 W11 W12 Taper Taper
 A B C D A B C D A B C D 1 2

The 12 Week Marathon Plan (4 Sessions)

Week/Day	1	Alternate Day 1	2	3	4	5	6	7
A W1,5,9,	60' (2 x 30' 3' rest) Alternate 7.5' @ 10KP 7.5' @ MP HR 80% -90% max	60' (2 x 30' 3' rest) Default MP or slower HR 75% max	60' (4 x 15' 4' rest) Alternate 6' @ 5KP 9' @ MP HR 85% -92.5% max	REST	60' (3 x 20' 2' rest) 20' each @ MP, 10KP, HMP HR 80% -90% max	60' (4 x 15' 4' rest) Alternate 6' @ 5KP 9' @ MP HR 85% -92.5% max	REST	REST
B W2,6,10	80' (2 x 40' 4' rest) Alternate 15' @ 10KP 15' @ MP 10' @ HMP HR 80% -90% max	80' (2 x 40' 4' rest) Default MP or slower HR 75% max	60' (4 x 15' 4' rest) Alternate 7' @ 5KP 8' @ MP HR 85% -92.5% max	REST	80' (4 x 20' 2' rest) 20' each @ MP, 10KP, HMP, MP HR 80% -90% max	60' (3 x 20' 5' rest) Alternate 7' @ 5KP 13' @ MP HR 85% -92.5% max	REST	REST
C W3,7,11	90' (2 x 45' 4.5' rest) Alternate 15' @ 10KP 15' @ MP 15' @ HMP HR 80% -90% max	90' (2 x 45' 4.5' rest) Default MP or slower HR 75% max	60' (4 x 15' 4' rest) Alternate 9' @ 5KP 6' @ MP HR 85% -92.5% max	REST	90' (3 x 30' 3' rest) Alternate 30' @ MP 30' @ 10KP 30' @ MP HR 80% -90% max	75' (3 x 25' .5' rest) Alternate 8' @ 5KP 17' @ MP HR 85% -92.5% max	REST	REST
D W4,8,12	60' (2 x 30' 3' rest) Alternate 7.5' @ 10KP 7.5' @ MP HR 80% -90% max	60' (2 x 30' 3' rest) Default MP or slower HR 75% max	60' (4 x 15' 4' rest) Alternate 6' @ 5KP 9' @ MP HR 85% -92.5% max	REST	60' (3 x 20' 2' rest) 20' each @ MP, 10KP, HMP HR 80% -90% max	60' (4 x 15' 4' rest) Alternate 6' @ 5KP 9' @ MP HR 85% -92.5% max	REST	REST

Sequence is: **W1** **W2** **W3** **W4** **W5** **W6** **W7** **W8** **W9** **W10** **W11** **W12** Taper Taper
 A **B** **C** **D** **A** **B** **C** **D** **A** **B** **C** **D** **1** **2**

The 12 Week Marathon Plan (3 Sessions)

Week/Day	1	2	3	4	5	6	7 Recovery or rest
A W1,5,9,	60' (2 x 30' 3' rest) Alternate 7.5' @ 10KP 7.5' @ MP HR 80% -90% max	REST	60' (4 x 15' 4' rest) Alternate 6' @ 5KP 9' @ MP HR 85% -92.5% max	REST	60' (3 x 20' 2' rest) 20' each @ MP, 10KP, HMP HR 80% -90% max	REST	30' Default MP or slower HR below 75% max
B W2,6,10	80' (2 x 40' 4' rest) Alternate 15' @ 10KP 15' @ MP 10' @ HMP HR 80% -90% max	REST	60' (4 x 15' 4' rest) Alternate 7' @ 5KP 8' @ MP HR 85% -92.5% max	REST	80' (4 x 20' 2' rest) 20' each @ MP, 10KP, HMP, MP HR 80% -90% max	REST	30' Default MP or slower HR below 75% max
C W3,7,11	90' (2 x 45' 4.5' rest) Alternate 15' @ 10KP 15' @ MP 15' @ HMP HR 80% -90% max	REST	60' (4 x 15' 4' rest) Alternate 9' @ 5KP 6' @ MP HR 85% -92.5% max	REST	90' (3 x 30' 3' rest) Alternate 30' @ MP 30' @ 10KP 30' @ MP HR 80% -90% max	REST	30' Default MP or slower HR below 75% max
D W4,8,12	60' (2 x 30' 3' rest) Alternate 7.5' @ 10KP 7.5' @ MP HR 80% -90% max	REST	60' (4 x 15' 4' rest) Alternate 6' @ 5KP 9' @ MP HR 85% -92.5% max	REST	60' (3 x 20' 2' rest) 20' each @ MP, 10KP, HMP HR 80% -90% max	REST	30' Default MP or slower HR below 75% max

Sequence is: **W1** **W2** **W3** **W4** **W5** **W6** **W7** **W8** **W9** **W10** **W11** **W12** Taper Taper
 A **B** **C** **D** **A** **B** **C** **D** **A** **B** **C** **D** **1** **2**

Two week taper

Week/Day	1	2	3	4	5	6	7
<u>1</u>	60' @ MP (2 x 30' 90" rest) HR 80-90% max	60' (2 x 30' 6" rest) Alternate 10' @ 5KP 20' @ MP HR 85%-92.5% max	30' HMP HR 85% -90% max	REST	30' HMP HR 85% -90% max	60' @ MP (2 x 30' 90" rest) HR 80-90% max	REST
<u>2</u>	45' MP HR 80% -90% max	30' 10' @ 5KP 20' @ MP HR 85% -90% max	30' HMP HR 85% -90% max	REST	30' HMP HR 85% -90% max	REST	MARATHO N ROW

Training paces

2000 m time	Marathon (MP) Stroke rate 18-22 Default pace (55%)	Marathon (MP) Stroke rate 20-22 (60-65%)	Half marathon (HMP) Stroke rate 22-24 (65-70%)	10,000 m (10KP) Stroke rate 24-26 (70-75%)	5,000 m (5kP) Stroke rate 26-28 (75-80%)
6:00	1:50.0	1:47.0 – 1:44.0	1:44.0 – 1:41.5	1:41.5 – 1:39.0	1:39.0 – 1:37.0
6:04	1:51.0	1:48.0 – 1:45.0	1:45.0 – 1:42.5	1:42.5 – 1:40.0	1:40.0 – 1:38.0
6:08	1:52.0	1:49.0 – 1:46.0	1:46.0 – 1:43.5	1:43.5 – 1:41.5	1:41.5 – 1:39.0
6:12	1:53.5	1:50.5 – 1:47.5	1:47.5 – 1:44.5	1:44.5 – 1:42.5	1:42.5 – 1:40.0
6:16	1:54.5	1:51.5 – 1:48.5	1:48.5 – 1:46.0	1:46.0 – 1:43.5	1:43.5 – 1:41.0
6:20	1:55.5	1:52.5 – 1:50.0	1:50.0 – 1:47.0	1:47.0 – 1:44.5	1:44.5 – 1:42.5
6:24	1:57.0	1:54.0 – 1:51.0	1:51.0 – 1:48.0	1:48.0 – 1:46.5	1:46.5 – 1:43.5
6:28	1:58.0	1:55.0 – 1:52.0	1:52.0 – 1:49.0	1:49.0 – 1:47.0	1:47.0 – 1:44.5
6:32	1:59.0	1:56.0 – 1:53.0	1:53.0 – 1:50.5	1:50.5 – 1:48.0	1:48.0 – 1:45.5
6:36	2:00.5	1:57.5 – 1:54.0	1:54.0 – 1:51.5	1:51.5 – 1:49.0	1:49.0 – 1:46.5
6:40	2:01.5	1:58.5 – 1:55.5	1:55.5 – 1:52.5	1:52.5 – 1:50.0	1:50.0 – 1:47.5
6:44	2:03.0	2:00.0 – 1:56.5	1:56.5 – 1:54.0	1:54.0 – 1:51.0	1:51.0 – 1:48.5
6:48	2:04.0	2:01.0 – 1:58.0	1:58.0 – 1:55.0	1:55.0 – 1:52.0	1:52.0 – 1:50.0
6:52	2:05.0	2:02.0 – 1:59.0	1:59.0 – 1:56.0	1:56.0 – 1:53.5	1:53.5 – 1:51.0
6:56	2:06.5	2:03.5 – 2:00.0	2:00.0 – 1:57.0	1:57.0 – 1:54.5	1:54.5 – 1:52.0
7:00	2:07.5	2:04.5 – 2:01.0	2:01.0 – 1:58.5	1:58.5 – 1:55.5	1:55.5 – 1:53.0
7:04	2:09.5	2:06.0 – 2:02.5	2:02.5 – 1:59.5	1:59.5 – 1:56.5	1:56.5 – 1:54.0
7:08	2:10.0	2:07.0 – 2:03.5	2:03.5 – 2:00.5	2:00.5 – 1:58.0	1:58.0 – 1:55.0
7:12	2:11.0	2:08.0 – 2:04.5	2:04.5 – 2:01.5	2:01.5 – 1:59.0	1:59.0 – 1:56.5
7:16	2:12.0	2:09.0 – 2:06.0	2:06.0 – 2:03.0	2:03.0 – 2:00.0	2:00.0 – 1:57.5
7:20	2:13.5	2:10.5 – 2:07.0	2:07.0 – 2:04.0	2:04.0 – 2:01.0	2:01.0 – 1:58.5
7:24	2:14.5	2:11.5 – 2:08.0	2:08.0 – 2:05.0	2:05.0 – 2:02.0	2:02.0 – 1:59.5
7:28	2:16.0	2:13.0 – 2:09.5	2:09.5 – 2:06.0	2:06.0 – 2:03.2	2:03.0 – 2:00.5
7:32	2:17.0	2:14.0 – 2:10.5	2:10.5 – 2:07.5	2:07.5 – 2:04.5	2:04.5 – 2:01.5
7:36	2:18.0	2:15.0 – 2:11.5	2:11.5 – 2:08.5	2:08.5 – 2:05.5	2:05.5 – 2:03.0
7:40	2:19.5	2:16.5 – 2:13.0	2:13.0 – 2:09.5	2:09.5 – 2:06.5	2:06.5 – 2:04.0
7:44	2:20.5	2:17.5 – 2:14.0	2:14.0 – 2:10.5	2:10.5 – 2:07.5	2:07.5 – 2:05.0
7:48	2:21.5	2:18.5 – 2:15.0	2:15.0 – 2:12.0	2:12.0 – 2:08.5	2:08.5 – 2:06.0
7:52	2:23.0	2:20.0 – 2:16.0	2:16.0 – 2:13.0	2:13.0 – 2:10.0	2:10.0 – 2:07.0
7:56	2:24.0	2:21.0 – 2:17.5	2:17.5 – 2:14.0	2:14.0 – 2:11.0	2:11.0 – 2:08.0
8:00	2:25.0	2:22.0 – 2:18.5	2:18.5 – 2:15.0	2:15.0 – 2:12.0	2:12.0 – 2:09.0

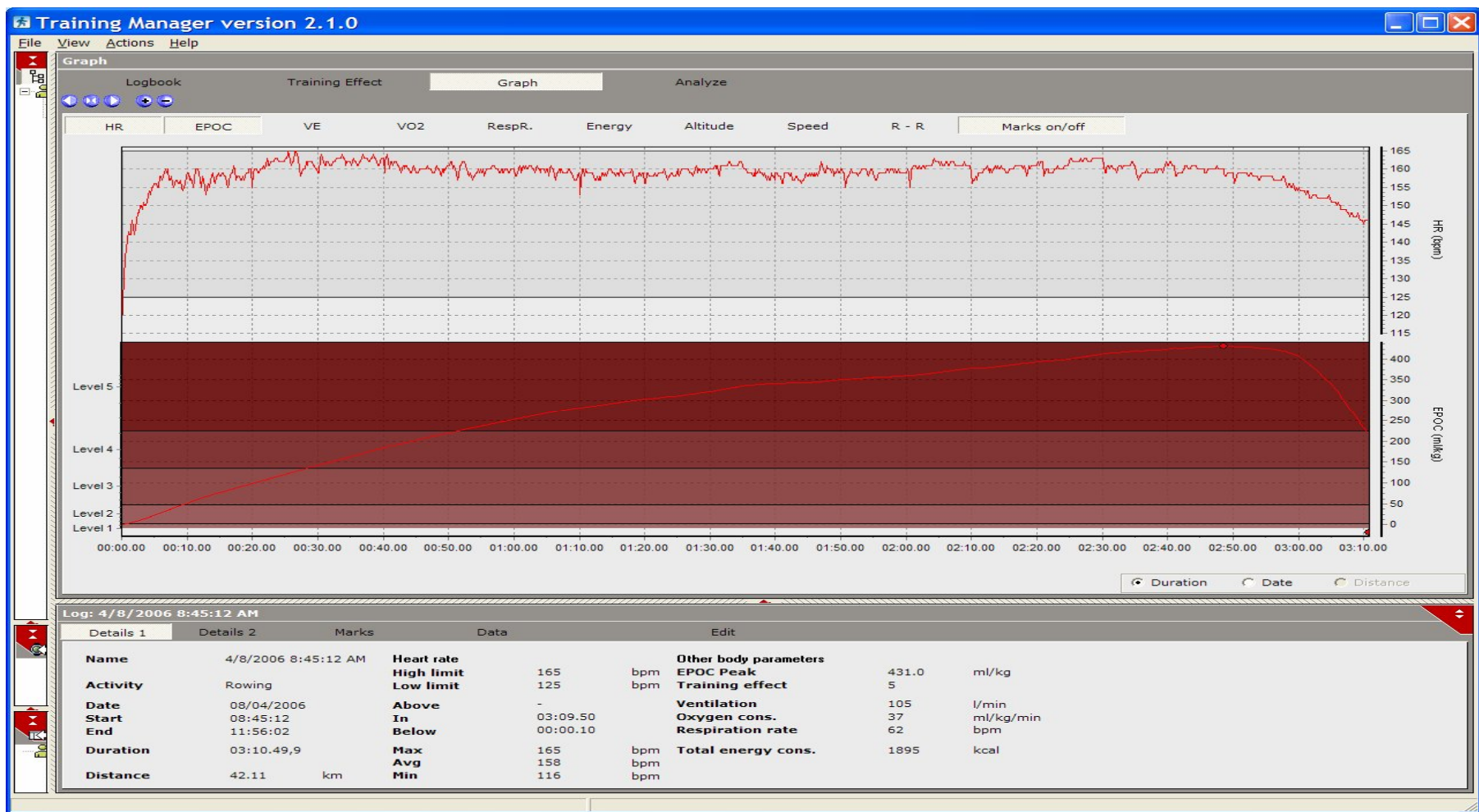
HR Chart

Max HR/HR %	75%	80%	85%	90%	92.5%
160	120	128	136	144	148
162	122	130	138	146	150
164	123	131	139	148	152
166	125	133	141	149	154
168	126	134	143	151	155
170	128	136	145	153	157
172	129	138	146	155	159
174	130	139	148	157	161
176	132	141	150	158	163
178	133	142	151	160	165
180	135	144	153	162	167
182	137	146	155	164	168
184	138	147	156	166	170
186	140	149	158	167	172
188	141	150	160	169	174
190	143	152	162	171	176
192	144	154	163	173	178
194	146	155	165	175	179
196	147	157	167	176	181
198	149	158	168	178	183
200	150	160	170	180	185

Anne Yates Metres	2000 m Splits	Stroke Rate	% VO2max	Heart Rate	% of Max HR
2000	02:15.6 09:03.3	20	79	157	89
4000	02:15.8 09:00.5	20	81	158	89
6000	02:15.1 08:56.1	20	79	159	90
8000	02:14.0 08:58.9	21	81	162	92
10000	02:14.7 08:58.4	21	77	160	90
12000	02:14.6 08:58.3	21	77	159	90
14000	02:14.5 08:58.6	21	77	161	91
16000	02:14.6 08:58.9	21	77	158	89
18000	02:14.7 08:59.5	21	77	158	89
20000	02:14.8 08:58.5	21	77	160	90
22000	02:14.6 08:53.6	22	77	158	89
24000	02:13.4 08:57.6	22	77	159	90
26000	02:14.4 08:58.4	22	77	159	90
28000	02:14.6 08:57.5	23	79	161	91
30000	02:14.3 08:59.1	23	81	161	91
32000	02:14.7 08:59.2	24	79	160	90
34000	02:14.8 09:01.2	25	81	161	91
36000	02:15.3 09:13.5	26	77	159	90
38000	02:18.3 09:12.4	26	77	159	90
40000	02:18.1 09:18.7	25	59	154	87
42000	02:19.6 09:31.7	25	21	152	86
42195	02:22.9 00:56.4	24	21	149	84

Total time 3 hours 10 minutes 50 seconds - Average pace = 2:15.6 (68% of 2000 m power in Watts – 7:57.3)
Average heart rate 158 = 89% - 77%-81% of maximum oxygen uptake

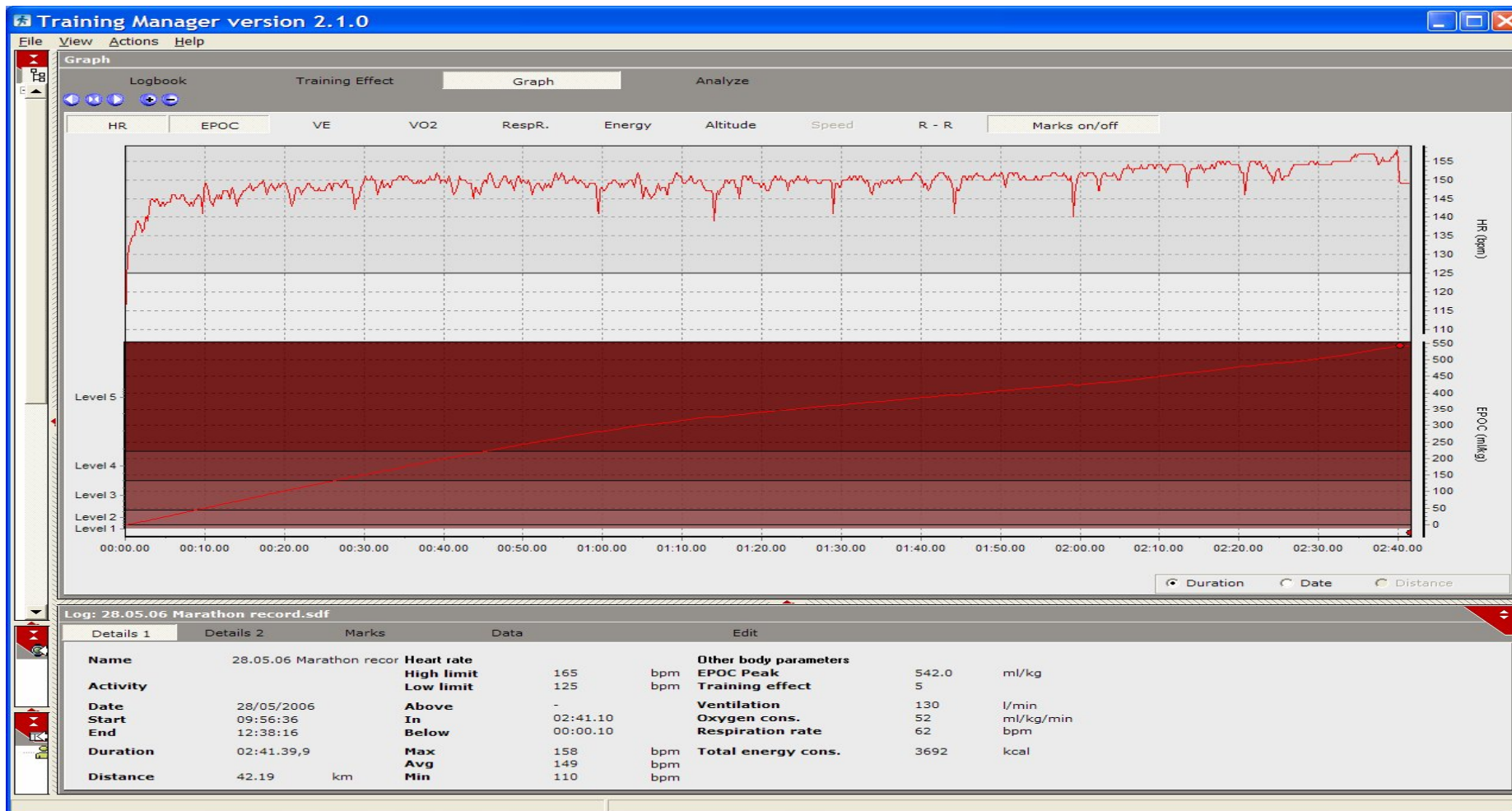
Anne Yates Heart Rate Development



Alex Brown Metres	2000 m Splits	Stroke Rate	% VO2max	Heart Rate	% of Max HR
2000	01:54.4 07:37.6	21	79	144	86
4000	01:54.4 07:37.7	21	80	148	88
6000	01:54.8 07:39.2	21	80	149	89
8000	01:54.7 07:38.9	22	80	150	89
10000	01:54.7 07:38.9	22	80	150	89
12000	01:54.5 07:38.1	23	80	151	90
14000	01:54.8 07:39.3	23	79	148	88
16000	01:54.5 07:38.3	23	79	149	89
18000	01:54.6 07:38.4	24	79	149	89
20000	01:54.8 07:39.2	24	79	150	89
22000	01:54.3 07:37.4	25	79	149	89
24000	01:54.6 07:38.4	26	80	151	90
26000	01:54.6 07:38.4	27	80	152	90
28000	01:54.7 07:38.9	27	80	152	90
30000	01:54.7 07:38.9	27	79	150	89
32000	01:54.9 07:39.7	27	80	152	90
34000	01:54.5 07:38.3	26	82	154	92
36000	01:54.7 07:39.1	26	82	154	92
38000	01:55.0 07:40.2	26	79	149	89
40000	01:54.9 07:39.8	27	84	155	92
42000	01:52.9 07:31.9	28	85	157	93
42195	01:44.1 00:40.6	31	85	157	93

Total time 2 hours 41 minutes 07 seconds - Average pace = 1:54.5 (63% of 2000 m power in Watts – 6:33.0)
Average heart rate 149 = 89% - 79%-85% of maximum oxygen uptake

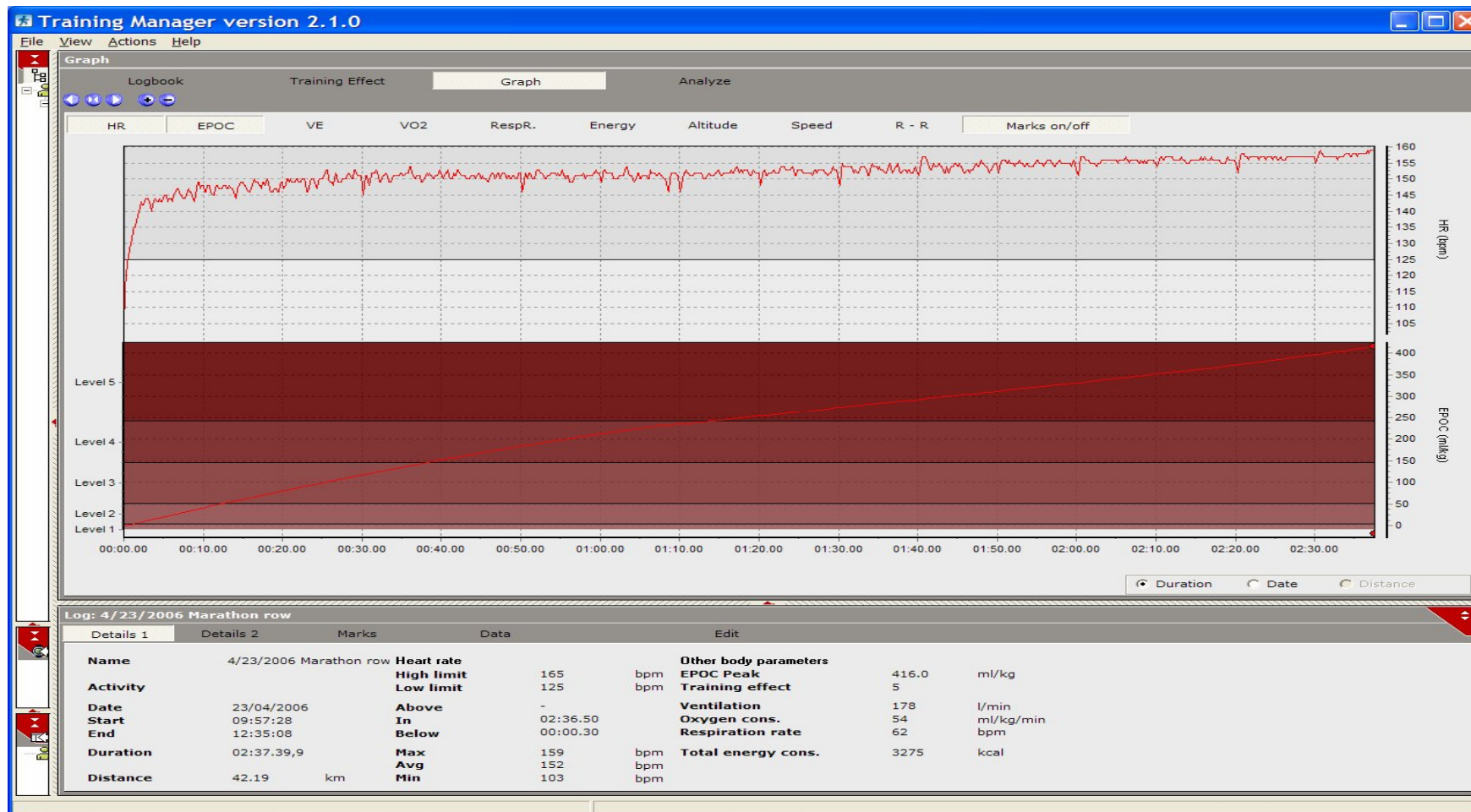
Alex Brown Heart Rate Development



Mark Whyman Metres	2000 m Splits		Stroke Rate	% VO2max	Heart Rate	% of Max HR
2000	01:51.7	07:26.8	21	74	144	84
4000	01:51.7	07:26.9	21	74	149	87
6000	01:51.6	07:26.7	21	75	150	87
8000	01:51.6	07:26.4	21	74	148	86
10000	01:51.7	07:26.9	21	75	149	87
12000	01:51.6	07:26.5	21	75	150	87
14000	01:51.6	07:26.6	21	77	152	88
16000	01:51.7	07:26.8	21	75	150	87
18000	01:51.7	07:26.9	21	77	152	88
20000	01:51.7	07:26.8	22	75	152	88
22000	01:51.7	07:27.0	22	75	152	88
24000	01:51.8	07:27.3	21	75	149	87
26000	01:51.7	07:26.9	22	77	155	90
28000	01:51.7	07:27.0	22	77	154	90
30000	01:51.6	07:26.7	22	78	155	90
32000	01:51.8	07:27.4	22	78	153	89
34000	01:52.1	07:28.7	22	78	156	91
36000	01:52.7	07:30.9	22	80	156	91
38000	01:53.1	07:32.6	22	80	157	91
40000	01:52.9	07:31.8	22	82	157	91
42000	01:53.2	07:33.1	23	83	159	92
42195	01:48.9	00:42.5	25	83	159	92

Total time 2 hours 37 minutes 29 seconds - Average pace = 1:51.9 (67% of 2000 m power in Watts – 6:33.0)
Average heart rate 152 = 88% - 74%-83% of maximum oxygen uptake

Mark Whyman Heart Rate Development



Anna Bailey Metres	2000 m Splits	Heart Rate	% of Max HR
2000	08:12.2	140	82
4000	08:12.5	143	84
6000	08:11.8	144	85
8000	08:12.6	146	86
10000	08:11.9	149	88
12000	08:12.2	149	88
14000	08:12.2	149	88
16000	08:12.1	150	88
18000	08:12.3	152	89
20000	08:12.3	152	89
22000	08:12.2	154	91
24000	08:12.2	154	91
26000	08:10.9	156	92
28000	08:13.0	156	92
30000	08:12.6	156	92
32000	08:12.1	158	93
34000	08:12.3	158	93
36000	08:13.4	160	94
38000	08:14.7	158	93
40000	08:18.3	161	95
42195	2195 09:01.5	164	96

Total time 2 hours 53 minutes 16 seconds – Average pace = 2.03.2 (65% of 2000 m power in Watts – 7:06.6) Average heart rate 153 = 90% - Stroke rate 20-22