

Exercise Guidelines —

Technique —

Stretching —

2,000m Race Training —

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Weight Management —

Indoor Rowing

Training Guide

Preface

We are constantly being asked for training advice, be it for a 2,000m race, rehabilitation or general fitness. But, as every personal trainer or fitness expert will tell you, prescribing training is not that simple. Level of fitness, training background, maximum heart rate, history of illness, time available to train and your own expectations are just a few of the factors that need to be considered when starting any training programme.

We have developed this Indoor Rowing Training Guide to address all these issues, and ultimately make sure you make the right training decisions. That is, whether you want to lose weight or simply stay healthy, train for a race or just get active again, row for hours every day or only 20 minutes every other day.

Although we can't anticipate every individual's requirements we aim to provide information on the basic principles involved in designing training programmes, and by including many and varied of examples, guide anyone in constructing an individual programme suited to their own personal needs.

The Indoor Rower is an incredibly versatile and adaptable machine and this guide will help you plan your exercise with renewed confidence - knowing that you're doing what's best for **you**.

WARNING: The information provided within this guide is not intended to be a substitute for medical advice. Many of the programmes featured involve demanding physical exercise. We strongly recommend that you check with your doctor prior to commencing any of the programmes to ensure that you are physically able to undertake such exercise. Concept II Ltd accepts no responsibility for illness or injury resulting from the use of this guide.



Indoor Rowing Training Guide

The Indoor Rowing Training Guide was written by Keith & Celia Atkinson, and international rowing coach Terry O'Neill, and produced by Concept II Ltd.

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Section 1 :

Effective

Use of the

Indoor Rower

1. Exercise Guidelines
2. Stretching
3. Technique
4. Technical Faults and Solutions

1. Exercise Guidelines

Although keen to get started on your training programme it's important to understand, and abide by, the health and safety procedures involved in Indoor Rowing. Please take time to read through this section carefully, before you start. That way you can avoid any unnecessary problems or injuries and get the most out of your programme, both in terms of performance and enjoyment.

Effective Exercise

The American College of Sports Medicine makes the following recommendations for the quality and quantity of training for developing and maintaining cardiorespiratory fitness in healthy adults:

- The activity should be one which uses large muscle groups, is maintained continuously and is rhythmical or aerobic in nature.
- The duration should be from 20 to 60 minutes, of continuous activity.
- Training should be regular; three to five times a week.
- The intensity of training should raise the heart rate to 60-85% of maximum heart rate (MHR).
- Strength training of moderate intensity should be added twice a week.

Safe Exercise

Indoor rowing is a safe and beneficial form of exercise. If you observe a few simple safety procedures, you can sustain an effective fitness programme with minimal risk. However, before you start, check through these routine precautions for your safety and comfort:

Personal Well-Being

- It's wise to have a health check before starting an exercise programme. You should never exercise if unwell.
- Always warm up, cool down and stretch thoroughly before and after each training session (see Section 1.2 Stretching).
- Take time to develop good technique before increasing training intensity (see Section 1.3 Technique and 1.4 Technical Faults and Solutions).
- When beginning an exercise programme don't overdo it; start slowly and build up gradually.
- Drink plenty of water during and after exercise. Don't wait until you are thirsty.

Section 1 : Effective Use of the Indoor Rower

- Ensure you train at an appropriate intensity. We recommend you base your training intensity on your heart rate (see Section 2.1 Training Intensity).
- Keep a training log to help set realistic goals and targets and plan future programmes of work (see Section 5.4 Training Log).

Machine Protocol

- Check the handle, seat and monorail are clean.
- Adjust the damper setting to the appropriate level for your workout (see Section 5.2 Damper Lever for an explanation of how the damper works).
- Place the handle in the handle hook before securing your feet.
- Adjust the footrests. If you have long legs, you may need to lower the footrests. Fasten the straps securely.
- Sit slightly towards the back of the seat.
- Pull straight back with both hands. Do not row with one hand.
- Do not twist the chain, pull from side to side or let go of the handle whilst rowing.
- Keep clothing, hair and fingers away from the seat rollers.
- When you finish your exercise, place the handle in the handle hook, then, after releasing your feet, return the handle to rest against the chain guide/monitor support.
- Always ensure that the machine is properly maintained.

2. Stretching

Stretching is an essential part of any workout. It promotes the elasticity of the muscles, ensuring that they are capable of performing the training tasks you set them, without fear of injury. However, before doing any stretches it's important to warm the muscles up. We recommend a few minutes gentle rowing before you start stretching. Then, after the main body of your workout and cool down you should complete the session with a second series of stretches.

Stretching Guidelines

- Regular stretching is important in improving flexibility and should be continued regardless of what stage of a training programme you have reached.
- It takes time to make significant progress with stretching exercises. So, start by selecting just a few simple exercises to begin stretching each muscle group. Then, very gradually, increase the number of stretches and condition the muscles to greater degrees of stretch.
- It's important to warm up the muscles with some light rowing before you start stretching. If required wear a tracksuit (or equivalent) to help keep the muscles warm.
- Stretching should be done slowly, with no jerking or bouncing movements. Move into the stretching position slowly, continuing until a good stretch on the muscles is felt. Never stretch to the point of pain.
- After reaching a good stretch position hold it for 10-15 seconds. This can gradually be increased to 45-60 seconds over a period of weeks. After each stretch release the body slowly from the position.
- The muscle being stretched should be as relaxed as possible. Stretch both sides of the body equally.
- Stretching exercises are not meant to be competitive. Do not compare progress with others as over stretching can lead to injury. Just as important, the overly flexible should be excluded from the stretching programme.
- Although the ageing process brings about stiffness and increasing lack of mobility, regular stretching programmes, especially yoga, can bring about great improvement.

Pre-Workout Stretches

Illustrated below are a series of warm-up stretches (1-16) specifically suited to indoor rowing. A number of them can also be reproduced on the Indoor Rower (17-28). All stretches shown are being applied to the right side of the body (except where the stretch is symmetrical).



1. Neck extensors - flex the chin to the chest.



2. Neck flexors - tip the head back.



3. Scalenes - side bend the head to the left, taking care not to rotate to the side.



4. Upper Trapezius - turn the head to the left. Note: if any of the above (1-4) cause dizziness stop and consult a doctor.



5. Triceps (front view) - place the right hand behind your neck. Use the left hand to apply stretch through the right elbow by gently pulling the elbow behind the head.



5. Triceps (back view).

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6. Biceps/Pectorals - stretch both arms behind you, keep the elbows straight and the thumbs pointing upwards.



7. Wrist flexors - with the elbow straight, use the left hand to apply stretch by pulling the palm away from the floor, keeping the fingers straight.



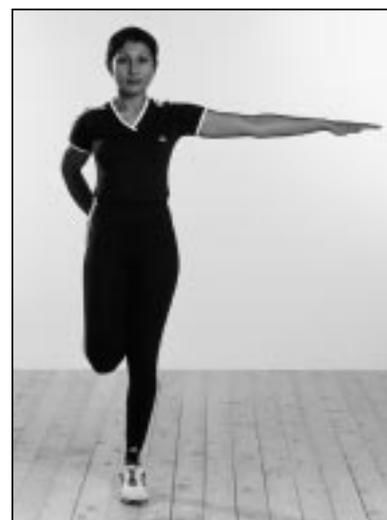
8. Wrist extensors - with the elbow straight, use the left hand to apply stretch by bending the wrist, taking the palm towards the floor, keeping the fingers bent.



9. Trunk stretch - with feet a shoulder width apart, stretch the right arm up towards the ceiling and over to the left.



10. Quadricep (side view) - stand with the left arm out to the side for balance, keeping your inner thighs together bend at the right knee, using the right hand to apply the stretch.

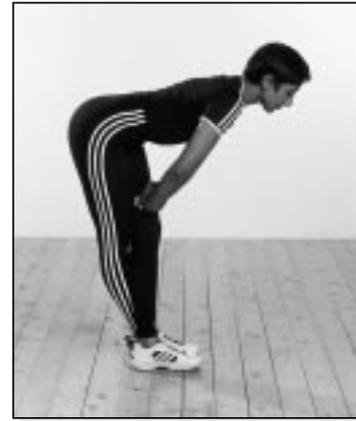


10. Quadricep (front view).

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11. Hamstrings - stand with feet together, bend from the waist, keeping your lower back flat. Use your arms to support your weight through your thighs.



12. Hamstrings with upper Hamstring bias - place the right leg behind left and repeat stretch 11.



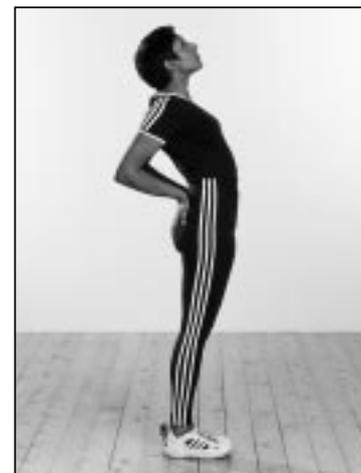
13. Abductors - stand astride, feet in line, keep the right leg straight, bend the left knee and stretch to the left.



14. Hip flexors Psoas/Quadriceps - stand astride, stretch forward, dropping the right knee toward the floor, keep the trunk upright, leaning back slightly.



15. Gastrocnemius (back leg) Soleus (front leg) - stand astride, stretch forward over the front leg, keeping the knee over the foot. Keep the back knee straight, keep both heels in contact with the floor.



16. Back extension rectus abdominis stretch - stand with feet shoulder width apart. Place your hands on your buttocks and arch backwards. Don't allow the hips to glide forwards.

Section 1 : Effective Use of the Indoor Rower

As shown here, many of the warm up stretches (1-16) can be reproduced on the Indoor Rower.



17. Trunk stretch



18. Triceps



19. Neck extensors



20. Neck flexors



21. Upper Trapezius



22. Scalenes

Section 1 : Effective Use of the Indoor Rower



23. Quadriceps



24. Gastrocnemius



25. Hamstrings



26. Biceps/Pectorals



27. Wrist extensors



28. Rhomboids - feet on floor, knees at right angles, keep the back flat, bend at the waist, lightly holding onto the monitor, slide backwards on the seat until you feel a stretch between your shoulder blades.

Post Workout Stretches

After a workout your body is in the optimum condition to develop and improve flexibility. Whereas warm-up stretches just get your body ready for exercise, cool-down stretches build on and increase your existing flexibility. The developmental stretches illustrated below should always be performed at the end of a training session. It is particularly important to keep your muscles warm during these stretches so always perform them indoors and wear warm clothing if required.



1. Flexion in lying; lower back/upper hamstrings - lie on your back with knees bent, feet on the floor, grasp around your knees and pull your thighs towards your chest.



2. Rotation in lying; pectorals, lateral abdominals and hamstrings - lie on your back, arms out to the sides. Bend the right knee and gently rotate the knee to the left. Gently straighten the right knee until you reach the point of tension. Keep the head, shoulders and arms flat on the floor.



3. Rotation in lying, knee bent; pectorals, lateral abdominals, buttock - start as in stretch 2. Grasp the right knee with the left hand, let the right knee rotate across the body to the floor.



4. Extension; back care exercise/rectus abdominis stretch - lie face down, place your hand under your shoulders, fingers pointing forwards. Straighten your arms as far as your back will allow you to go, keeping your hips in contact with the floor and the buttocks and hamstrings relaxed.

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5. Rhomboids/latissimus dorsi stretch - kneel on all fours, arms straight in front and spread slightly apart. Lower your chest to the floor, keeping the pelvis still.



6. Piriformis, buttock, lateral torso - sit upright on the floor, cross the right foot over the left and slide the heel of the right foot towards you. Tuck the right hand behind your hip. Place the left hand on the outside of the right knee to apply the stretch. Turn your head to look over the left shoulder. Note: keep the right buttock in contact with the floor.



7. Piriformis - lie flat on your back with the left knee bent. Place the right heel on the left knee. Take hold around the left thigh and draw the thigh up towards your chest.



8. Hamstrings - sit on the floor, bend the left knee and slide your heel towards the right inner thigh. Keep your back straight and flex from the hips, moving your torso towards the right thigh.



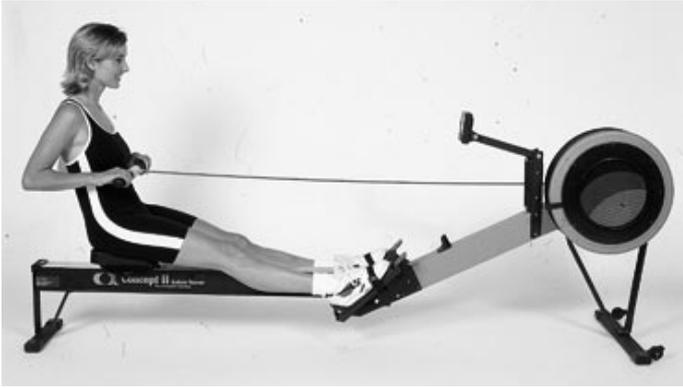
9. Hamstrings - lie flat on your back, lift the right leg upwards with the knee bent until the hip is at a right angle to your body. Taking hold around the thigh, gently straighten the knee until you reach the point of tension.

3. Technique

The effort that you put in to refining your technique during the early stages will improve both your performance and enjoyment of the exercise. Illustrated on the facing page are the two phases of the rowing stroke - the Recovery and the Drive, that blend together into one fluid movement. From the Finish position you slide forward (the Recovery) to the Beginning of the stroke and then, without pausing, you press back with your legs and begin the Drive. The full stroke should be smooth and rhythmic with a Recovery to Drive ratio of 2:1. Aim to row a smooth accelerated Drive and a steady, relaxed Recovery.

Good technique is an on-going, learning process. Even after years of experience top rowers continually strive to perfect their technique, and knock tenths of seconds off their performances.

Section 1 : Effective Use of the Indoor Rower



The Finish

- The legs are flat.
- The handle is drawn to the body and held lightly.
- The body is inclined slightly back.
- The elbows are drawn past the body. The forearms are horizontal and the wrists flat.
- The shoulders are down and relaxed.



The Recovery

- Start with the legs flat.
- Extend the arms forward.
- Rock the body over from the hips when the arms are straight.
- Compress the legs so the seat slides forward on the monorail.
- The arm and body positions stay the same as you slide forward.

Sequence = hands, body, then slide.



The Beginning

- The arms are fully extended and relaxed.
- The wrists are flat.
- The legs are compressed with the shins vertical.
- The body is pressed up to the legs.



The Drive

- The arms are fully extended and relaxed.
- Push the legs down and lever the body back.
- Maintain straight arms until the handle passes over knees.
- Draw the handle to the body, forearms horizontal and wrists flat.
- Draw the elbows past the body.
- The Drive is complete when you return to the Finish position.

4. Technical Faults and Solutions

Correct technique is essential for efficient rowing and to reduce the risk of injury. Here are some of the most common technical errors, with their solutions, to help you prevent or correct any problems.

Fault

1. Rowing with bent arms



The rower starts the Drive by pulling with the arms rather than pushing with the legs.

Solution



The Drive should start by pushing the legs and bracing the back with the arms fully extended and relaxed. The arms connect the legs and the back onto the handle.

2. Flying elbows



The rower's elbows are sticking out sideways from the body at the Finish.

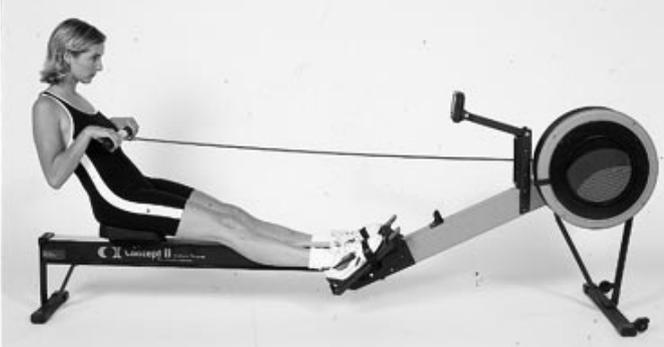


Draw the handle to the body. The wrists are flat with the elbows drawn past the body, forearms horizontal.

Section 1 : Effective Use of the Indoor Rower

Fault

3. Bent wrists



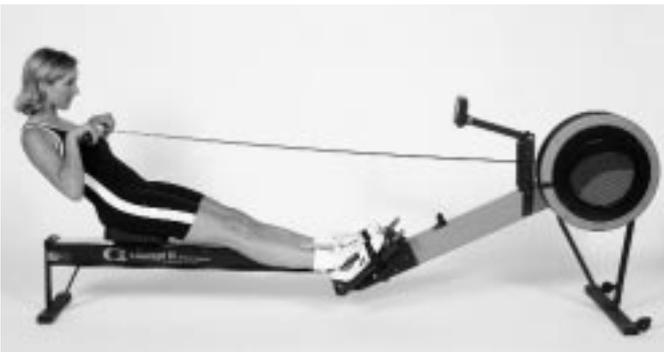
Rowers can be seen at various stages of the Drive - Beginning, Drive and Finish - with bent wrists.

Solution

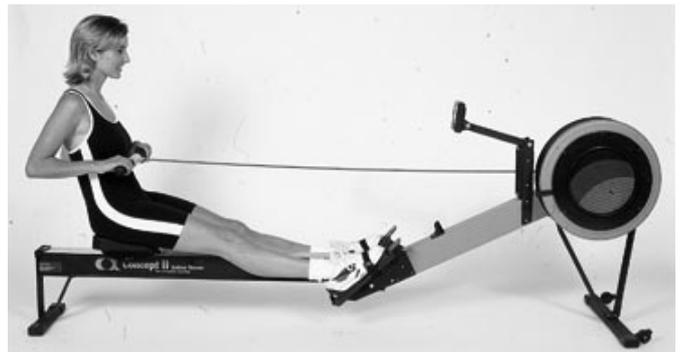


Always row with FLAT wrists. Check the hands at each stage of the Drive.

4. Pulling up too far and leaning back too much



At the Finish of the stroke, the rower pulls the handle up too high and leans back too far.



Draw the handle into the body. The wrists should be flat with the elbows drawn past the body, forearms horizontal.

5. Slide shooting



The legs push away too early, the back is not braced and so the power is not transferred onto the handle.



The legs begin the drive and the body levers back with straight arms transferring the leg power onto the handle.

Section 1 : Effective Use of the Indoor Rower

Fault

6. Using the back too early



The rower starts the Drive by swinging the body back rather than pushing the legs. This results in a weak movement.

Solution



The legs begin the drive and the body leans back with the arms fully extended and relaxed.

7. Knees up too early



On the Recovery the rower slides forward before the handle has extended past the knees. The hands either hit the knees or the rower lifts the hands to clear the knees.



Remember the Recovery sequence - hands, body, then slide. AFTER the arms have fully extended and the body has rocked forward, slide forward, maintaining the arm and body position.

8. Over reaching



The body stretches too far forward. The shins may be past the vertical. The head and shoulders tend to drop towards the feet. The body is in a weak position for the Drive.



The shins are vertical. The body is pressed up to the legs. The arms are fully extended and relaxed, body tilted slightly forward. This position should feel comfortable.

Section 1 : Effective Use of the Indoor Rower

Fault

9. Body too tense. Grip on handle too tight.



Teeth are clenched, shoulders hunched and the rower is gripping the handle too tightly.

Solution



RELAX! Relax the shoulders down, unclench the teeth and relax the jaw. Keep a LIGHT hold on the handle.

10. Pulling the body to the handle



At the Finish, the rower, instead of pulling the handle to the body, pulls herself forward to the handle.



At the Finish the rower leans back slightly, holds the legs down and draws the handle to the body using the upper body as a firm platform.



Section 2 :

Training

Guidelines

1. Training Intensity
2. Training Periods

1. Training Intensity

The 'no pain, no gain' approach to training, where athletes pushed themselves to the limit in every session, has long since passed. A much greater understanding of exercise and its effects on the body has been developed over the last 20 years. We now know that by varying the intensity or level at which you train, it is possible to bring about specific improvements with a much lower risk of illness or injury.

Heart Rate Exercise

Heart rate controlled training helps to ensure that your training is of an appropriate intensity. All the training programmes in this guide are based on heart rate.

Resting Heart Rate (RHR)

As you start on a programme of exercise, you will probably want to measure your RHR. This is best done first thing in the morning, on several successive days. A normal RHR in an untrained individual will be anywhere between 50 and 90 beats per minute (bpm). There will be daily variations of 2-3 bpm. Women often have slightly higher heart rates than men, both at rest and during exercise. Your aim, through training, is to lower your RHR, but don't assume that just starting off with a low RHR is an indication of fitness. A heart rate which becomes lower at rest, and whilst training at a given workload, is evidence that cardiovascular efficiency is improving and you are getting fitter.

Unexplained rises in the RHR taken in the morning (by 5 bpm or more) may indicate that you are about to come down with an illness, but check if there is any other reason. Factors which may influence RHR include temperature, excitement, caffeine, nicotine, dehydration and overtraining as well as illness or infection. If you cannot find a reason, and have not changed your training in any way, consider illness and rest from exercise for a few days, until your RHR returns to normal.

Exercise Intensity and Fitness Level

If you have not exercised for some time you should start exercising gently and at a low level of intensity. It is always wise to check on your health and fitness status with your GP or fitness trainer and exercise accordingly. You should not exceed 70% of your Maximum Heart Rate (MHR) until you have progressed sufficiently to ensure that you are ready to work more intensively. The advice of a professional instructor is recommended for those new to exercise.

If you are already fairly fit you will find that exercising at 70-85% of MHR is sustainable. Overall we recommend an exercise intensity of between 55-90% of MHR.

Exercise Intensity and Energy Source

Energy is stored in the body in two forms; carbohydrates, in the form of glycogen which is stored in muscles and fat which is stored elsewhere, around the body.

Section 2 : Training Guidelines

Table 2.1

Relationship between Exercise Intensity and Energy Source			
Exercise Intensity %MHR	Heart Rate (bpm)	% Carbohydrate	% Fat
65-70	130-140	40	60
70-75	140-150	50	50
75-80	150-160	65	35
80-85	160-170	80	20
85-90	170-180	90	10
90-95	180-190	95	5
100	190-200	100	-

Notes

Example 20 year old, MHR = 200

During exercise, we use a combination of carbohydrates and fat (Table 2.1). As we work harder and the heart rate rises, a higher proportion of carbohydrates are used. The body only has a limited store of carbohydrates in the muscles, so high intensity work can only be sustained for short periods. When we work at a lower intensity, we mainly use fat. Since the body stores large amounts of fat, low intensity work can be maintained for long periods.

Heart Rate Rises

Expect your heart rate to rise before exercise - this is the stress-related anticipatory rise. Also expect your heart rate to rise slowly with increasing exercise duration - this is cardiovascular drift, and will be around 5-10 bpm after about 15 minutes of rowing, even on a cool day. It represents fluid loss from the blood, and the body's cooling responses. After about 30 minutes, and depending on your effort and level of fitness, this drift will continue. If cardiovascular drift is higher than this (20-30 bpm), suspect that you are dehydrated, or your glycogen is low.

Target Heart Rate

Target heart rate is the intensity needed to improve cardiovascular fitness. It depends primarily on your age and not your state of fitness. During your training sessions your heart rate should normally be 60-85% of MHR. Your MHR is calculated as 220 minus your age. For example, if you are 40 years old your MHR is $220 - 40 = 180$ bpm. Your 60% intensity level is calculated as $180 \times 0.60 = 108$ bpm, whilst your upper target heart rate limit is $180 \times 0.85 = 153$. This means that if you are 40 years of age the exercise you perform should be at least 108 bpm and not greater than 153 bpm. **Note:** the error associated with calculating MHR based on age is plus or minus 10-12 bpm.

Training Bands

To get the maximum benefit from the effort that you put into your training you will need to work at an appropriate level of intensity. If the intensity is too high injury or fatigue may occur, whilst if the intensity is too low, it will be ineffective. Training bands define the different levels of intensity, and describe what is happening to the body at different work loads. They correlate closely with heart rate levels and are the basis upon which the training programmes listed in this guide have been constructed. However, before defining the training bands it's important to understand the concepts of aerobic and anaerobic work upon which the training loads are based.

- Aerobic work is exercise which uses oxygen and is the foundation of most training on the Indoor Rower. It is work which is done at a low to medium stroke rate, 18-24 strokes per minute (spm), and can be maintained for sustained periods (30-90 minutes). During this type of work fat is the main fuel burned.
- Anaerobic work is exercise without oxygen. It is hard work done over very short periods which cannot be sustained; short bursts of maximum effort - like 100 metre sprints. At this level carbohydrate is the main fuel burned.

Table 2.2 illustrates the relationship within the training bands of heart rate and stroke rate. It describes how you may feel during the training and the training effect of working within each band.

Training Load

The training load consists of the quantity and quality of work. Quantity is the time or distance spent on the machine such as 5,000m or 2 x 10 minutes work, whilst quality is the effort exerted in the training session, represented as power output (500m splits), number of strokes per minute (spm), and heart rate (bpm).

In a systematic training plan designed for competing the load goes from quantity to quality. The training starts with a large quantity of relatively low or medium quality work to improve endurance. As training progresses there is a gradual increase in quality with a corresponding decrease in quantity to meet the specific demands of competition.

Section 2 : Training Guidelines

Table 2.2

Training Bands					
Band	Type of Work	% MHR	Rate (SPM)	What it is good for	How you feel
UT2	Utilisation 2. Light aerobic, low intensity work. Sustainable and fat burning.	55-70	18-20	General CV fitness.	Relaxed. Able to carry on a conversation.
UT1	Utilisation 1. Heavy aerobic work using more oxygen.	70-80	20-24	Higher level of CV fitness.	Working. Feel warmer. Heart rate and respiration up. May sweat.
AT	Anaerobic Threshold. Harder work. On the aerobic limit. Pushing into anaerobic area.	80-85	24-28	High level of CV fitness. Building mental and physical tolerance.	Hard work. Heart rate and respiration up. Carbon dioxide build up. Sweating. Breathing hard.
TR	Oxygen Transportation. Working hard. Unsustainable for long periods.	85-90	28-32	Developing oxygen transport to the muscles under stress. Increasing cardiac output.	Stressed. Panting. Sweating freely.
AN	Anaerobic (without oxygen). Short bursts of maximum effort. Unsustainable. Burning carbohydrate.	90-100	32+	Anaerobic work. Increasing speed. Accustoming the body to work without oxygen.	Very stressful. Gasping. Sweating heavily.

Notes

SPM = strokes per minute

%MHR = percentage of maximum heart rate

CV = cardiovascular

Wave Principle of Training

Training Cycles

The training cycle is a limited period of training, usually between four to eight weeks, that is directed towards a specific objective. A stepped or wave approach has been shown to be more efficient than a linear or continuous method of loading. The wave principle requires that a training load increase is followed by a decrease to allow adaptation to take place in the body.

The number of training sessions carried out in a week and the wave pattern developed during these sessions is called a micro-cycle. Six weeks or six micro-cycles form a macro-cycle. The number of macro-cycles that make up the overall training plan is determined by the length of the pre-competition period.

For example, if you have 18 weeks to the competition, then there are 3 x 6 week macro-cycles. Your next step is to determine the training aim during each of the macro-cycles. Depending on your current level of fitness, you may decide to focus on general endurance during the first macro-cycle. This will mean that the majority of the training during this phase will be long intervals of 20-40 minutes low intensity work.

During the second macro-cycle the quality should increase and the quantity decrease. This means the work intervals will become shorter, 6-10 minutes, and the power output and heart rate will increase.

The third macro-cycle would be more specific race preparation. In the example of a 2,000m race the work intervals would be focused on part of the race e.g. 4 x 1,000m pieces or 12 x 250m.

2. Training Periods

Serious competitors divide the year into four training periods; transition, preparation, pre-competition and competition, which enables them to be at their peak when required. Table 2.3 illustrates the training periods and their objectives for a 12 month training programme.

Table 2.4 gives guidance on how to periodise your training for training periods from six to 48 weeks.

Table 2.3

Training Periods & Objectives of a 12 month Training Programme				
Preparation 27 weeks	Pre-Competition 9 weeks	Competition 12 weeks		Transition 4 weeks
Development of general physical capacity, strength and cardiovascular (CV) fitness. Development of good technique. Mentally, athlete improves concentration to maximise technical improvement and build confidence for the coming competition.	Training becomes more specific. Athlete continues to work on good technique and mental preparation.	Intensity of training increases which, if unchecked, can lead to breakdown in technique. Identify weaknesses and work on them during low intensity sessions. This is the time to develop tactics and strategy for competition, as well as to stabilise competition performance.	Taper Period (the last 7-10 days of Competition)	Rest! This is the time for complete mental and physical relaxation and can include holidays. A minimal level of activity should be maintained using cross-training techniques. Time for evaluation, and to set objectives for the next year.
			Intensity and duration of training is dramatically reduced to allow the body to fully recover from the intense training of the Competition Period. Athlete focuses on race strategy and pre-race warm up, keeping the sessions short. This is also an opportunity to polish up technique.	
Flexibility is an important component of all training periods				

Notes

- i. Although the table reads left to right, to periodise your training you must work back from the date of your main competition.
- ii. Transition period: four weeks after the main competition.
- iii. Competition period: From the date of the competition you wish to peak at count back 12 weeks (4 x 3 week cycles). The last seven to ten days of this period will be a taper.
- iv. Pre-competition period: Count back a further nine weeks (3 x 3 week cycles).
- v. Preparation period: The remaining 27 weeks.
- vi. To check how you are progressing, and the effectiveness of your training, you should keep a training log and do some baseline test on a regular basis (see Section 4 Monitoring Progress).

Section 2 : Training Guidelines

Table 2.4

Training Periods (weeks)			
Period until Race	Preparation	Pre-Competition	Competition
6	-	-	6
7	1	-	6
8	2	-	6
9	3	-	6
10	3	1	6
11	3	2	6
12	3	3	6
13	3	4	6
14	3	5	6
15	3	6	6
16	3	4	9
17	3	5	9
18	3	6	9
19	3	4	12
20	3	5	12
21	3	6	12
22	3	7	12
23	3	8	12
24	3	9	12
25 - 48	3 - 27	9	12

Notes

The last 7-10 days of the competition period will be a taper.

Tapering

For 7-10 days prior to an important competition you should taper off your training. Some people think that to reduce training doses at this time will lead to a loss of fitness but this is not true. Training is a combination of overload and super-compensation. This means that during exercise the body is brought to the point of exhaustion and, during the recovery period, the body recuperates to a point of greater capacity than before. The super-compensation period lasts for 7-10 days after the end of a training regime and so any fears of a loss of condition are groundless.

The best use of this time is to focus on race strategy, getting the pre-race warm-up right, and polishing up technique. It is important to avoid the build up of lactic acid close to competition. The longest single piece of high intensity work should not exceed 90 seconds. A couple of these at the beginning of the final week should be okay, cutting back to bursts of 30 seconds in the days immediately preceding competition. If preparing for a 2,000 metre race, we recommend that the total number of hard strokes during the whole of the tapering period should not exceed 300.

Body Adaptation

Perhaps surprisingly, the training session itself does not actually bring about an improvement in performance. It is during periods of rest and recovery that the body adapts to demands made on it from exercising. As your physical performance improves, you can increase the training volume which in turn will change the type of training you do. People training four or five times a week will benefit from a high percentage of high intensity sessions, whilst those training twice a day may only complete 20-30% of their total training programme at high intensity.

Training intensity is determined by the heart rate a workload elicits. Training sessions which cause the heart rate to increase to near maximum are high intensity. Sessions which can be completed at moderate heart rate are low intensity.

To ensure the desired adaptation takes place a number of factors need to be considered:

- Training needs to be regular to stimulate adaptation in the body.
- There needs to be enough time between sessions for the adaptation to take place.
- The amount of training needs to be increased as adaptation takes place.
- The training programme needs to be specific to the needs of the individual.
- Training needs to be tailored to the specific physical demands of a particular sport.
- There must be a system for monitoring progress within the programme.

Structuring the Programme

The number of training sessions per week you are prepared to commit to will have a profound impact on the mix of training you will do. In simple terms if you are only training three or four times a week the intensity of your programme will proportionally be higher than if you are training seven or eight times a week.

To make some sense of this, Table 2.5 outlines a suggested mix of training based on the number of training sessions per week, the training bands and the period of the year that you are training in. Table 2.6 illustrates the type of work, stroke rate and heart rate appropriate to each training band.

By referring to tables 2.3, 2.4, 2.5 and 2.6 and using the Wave Principle of Training you should be able to start constructing your programme.

Section 2 : Training Guidelines

Table 2.5

Training Bands Mix (Based on Training Period & Training Sessions per Week)										
No. of Sess.	Preparation		Pre-Competition			Competition				
	UT2	UT1	UT2	UT1	AT	UT2	UT1	AT	TR	AN
3	-	3	-	1	2	-	-	-	2	1
4	-	4	-	2	2	-	-	1	2	1
5	1	4	1	2	2	-	1	1	2	1
6	2	4	1	2	3	-	1	1	2	2
7	3	4	1	3	3	-	1	2	2	2
8	4	4	2	3	3	1	1	2	2	2

Notes

Select the number of sessions you wish to train each week, taking note of the number of sessions required in each training band.

Table 2.6

Work in Each Training Band						
1	2	3	4	5	6	7
Band	Time in Band	Type of Work	Recovery	Example	% MHR	SPM
UT2	60-90 min	Long intervals 20-90 min	10-20%	60 min steady state	55-70	18-20
UT1	30-60 min	Long intervals 10-30 min	25-50%	3 x 10 min: 5 min rest	70-80	20-24
AT	18-24 min	Medium intervals 6-10 min	50%	3 x 6 min: 3 min rest	80-85	24-28
TR	12-18 min	Short intervals 2-5 min	100%	6 x 2 min: 2 min rest	85-90	28-32
AN	9-12 min	Bursts 45-90 sec	100%	6 x 90 sec: 90 sec rest	90-100	Max

Notes

- i. Band: The training band in which the athlete is working.
- ii. Time in Band: The duration of training within each training band.
- iii. Type of Work: The type of work for the training session.
- iv. Recovery: The recovery time, expressed as a percentage of the work time.
- v. Example: An example of the work.
- vi. %MHR: The percentage of maximum heart rate appropriate for the type of work.
- vii. SPM: Strokes per minute.

Programme Interruptions

The training programme is a map that guides you from where you are physiologically to where you want to be. Like any journey there is more than one way to get to your destination. The training programmes are written in advance and are designed to illicit an appropriate response, but in all programmes there is an element of guess work. Don't regard the programme as cast in stone. If you depart from the programme don't be discouraged or tempted to give up as, within reason, lost time can be recovered.

Illness - If you have lost time through illness and it has required you to see a doctor then you should resume training under his guidance. If you were just under the weather with a cold, once your RHR has returned to normal, complete two days of general low intensity training and, if there are no bad reactions, pick up the programme as if there had been no break.

Injury - If you have lost time because of injury you must resume training under the strict supervision of your doctor or physiotherapist. You should not take it upon yourself to resume training as you may aggravate the injury and lose more time.

Holiday - If you lose up to two weeks training due to holiday or other commitments your training programme can be picked up again at the appropriate point. For example, if you take a two week holiday after week 5 of a 12 week pre-competition programme, pick up on week 7 when you return.

If you train just three times a week and miss one session you should make it up. However, you must not try to make up more than one or two missed training sessions as you will not have enough rest and recovery days to allow your body to adapt to the exercise. You should just carry on your programme as though there has been no break.

After three weeks lost training complete two days of general low intensity training then pick up the programme as if there had been no break. After four or more weeks lost training you should consider starting your programme again.



Section 3 :

Training

Programmes

1. Programme Guidelines
2. Basic Conditioning
3. Weight Management
4. 20 Minute Fitness
5. 40 Minute Fitness
6. 2,000m Race Training
7. Marathon Training
8. Cross Training

1. Programme Guidelines

The Basic Conditioning, Weight Management, 20 Minute Fitness and 40 Minute Fitness programmes are for those who have achieving general health and fitness as their priority, whilst the 2,000m Race training, Marathon Training and Cross-Training programmes are designed with a specific competition focus in mind. Each programme indicates a target group, but you must use your best judgement with regard to how you are coping and progressing. If you find that the work is hard, and you are having difficulties maintaining the programme, ease off and consider working at a gentler pace, perhaps on another programme. Equally, if you find that it's too easy, look at moving on to the next level.

Beginning Your Programme

Before embarking on any exercise programme remember the following:

- Ensure you are medically able to start exercising. Have a fitness assessment first.
- Always listen to your body and be prepared to take a rest if you are tired. Rest is a very important part of the training process as this is when your body adapts to training loads.
- Take care not to overdo it in the early stages and never train when you are ill.
- Work within the limits of your MHR (see Section 2.1 Training Intensity).
- Don't become a slave to the programme.
- Exercise safely (see Section 1.1 Exercise Guidelines for complete safety guidelines).

Training Periods

In the 20 Minute Fitness and 40 Minute Fitness programmes the training periods have been defined as preparation, development and consolidation. The preparation period is the start up period, when you are getting used to a regular training regime; the development period should be started when you are happy that you've mastered technique and have established a regular exercise routine. You can then begin to work a little harder during each session. Provided progress is good you may wish to push on further into the consolidation period. The main changes are that the stroke ratings (spm) will rise and the quality and intensity of the work will increase. In short, you will work harder and rate higher.

For those of you who become interested in competition, the preparation, development and consolidation periods can relate to the preparation, pre-competition and competition periods for 2,000m Race Training.

2. Basic Conditioning

Target Group: 40+, or younger people who are unfit and have done little or no exercise.

Dr Fritz Hagerman, Professor of Physiology at Ohio University, USA and Chairman of FISA's* Rowing Sports Medicine Commission has written the following exercise programme for the Indoor Rower following research into the effects of exercise on adults who had led a largely sedentary lifestyle and had not exercised in years. The results were amazing. Starting with five one minute rows, with rests in between, the group worked on a step-by-step basis, gradually building up to a level of fitness which enabled them to row continuously for 30 minutes.

The basic conditioning programme is designed to be a gentle introductory training programme, setting an upper training intensity limit of 75% MHR or a level at which conversation can be maintained, whichever is lower.

The programme can be adapted to your needs. For example; you can double the rest time or vary the steps (i.e. go from one minute to one and half minutes and from two minutes to two and half minutes) if you wish. What is necessary though is regularity - establish a routine of one day's work followed by one day's rest in the early stages.

* FISA - the world governing body for the sport of rowing.

Section 3 : Training Programmes

Table 3.1

Basic Conditioning Programme Framework					
Step	Band	Row	Rest	Workload	Work Time
1	UT1	1' @ 75%	30 sec	5 reps, adding another rep each workout until you can do 8, then go to next step.	5-8'
2	UT1	2' @ 75%	30 sec	Same as step 1	10-16'
3	UT1	3' @ 75%	30 sec	Same as step 1	15-24'
4	UT1	4' @75%	30-60 sec	4 reps, adding another rep each workout until you can do 7, then go to next step	16-28'
5	UT1	5' @ 75%	30-60 sec	Same as step 4	20-35'
6	UT1	Continuous rowing	-	Start by rowing continuously for 20 min, add 2 min each day until you reach 30 min	20-30'

Notes

Step 1 means row for one minute at up to 75% of your MHR, then rest for 30 seconds. Repeat so that you complete five repetitions altogether. When you feel capable add another repetition until you can comfortably complete eight repetitions. Then move on to step 2, and so on. Step 1 represents between five and eight minutes of exercise.

Table 3.2

Basic Conditioning Programme				
Step	Stage 1	Stage 2	Stage 3	Stage 4
1	5 x 1' UT1 20-24spm	6 x 1' UT1 20-24spm	7 x 1' UT1 20-24spm	8 x 1' UT1 20-24spm
2	5 x 2' UT1 20-24spm	6 x 2' UT1 20-24spm	7 x 2' UT1 20-24spm	8 x 2' UT1 20-24spm
3	5 x 3' UT1 20-24spm	6 x 3' UT1 20-24spm	7 x 3' UT1 20-24spm	8 x 3' UT1 20-24spm
4	5 x 4' UT1 20-24spm	6 x 4' UT1 20-24spm	7 x 4' UT1 20-24spm	-
5	5 x 5' UT1 20-24spm	6 x 5' UT1 20-24spm	7 x 5' UT1 20-24spm	-
6	1 x 20' UT1 20-24spm	1 x 22' UT1 20-24spm	1 x 24' UT1 20-24spm	keep adding 2' steps

Notes

Move from one stage to the next only when you feel ready - there are no time restrictions.

3. Weight Management

Target Group: Anyone wishing to lose weight or maintain a healthy weight.

For weight management, long periods of low intensity exercise are recommended. However, during exercise, the body will use dietary fat before it uses stored fat, so to make your exercise effective, you will need to reduce the amount of fat in your diet.

A balanced diet is one where you match the energy intake through your diet with the energy output of your lifestyle. Energy is measured in calories and is provided by a combination of carbohydrates (glycogen) and fat. For each gram of glycogen we get 4.3k calories and for each gram of fat we get 9k calories. If you exercise at high intensity, you will burn more calories, but they may not be the ones you want to burn, and just counting calories may not take into account the energy source you are using.

To achieve and maintain your weight goals you need to have realistic expectations and not seek a quick fix. Many people have unrealistic expectations, want swift results and give up if these fail to occur. Here are just a few of the weight loss myths exposed:

- Crash diets do not work. Low calorie diets may bring a quick weight loss, but studies show this is usually temporary and that the body gets accustomed to a low calorie intake and slows down the metabolism. On return to a normal diet the body will not be able to speed up to burn off the extra food and will store it as fat.
- Skipping meals makes the body famished and causes overeating. It is better to space calorie intake over the course of a day. To lose weight, eat 25% of calories at breakfast, 50% at lunch and 25% at dinner.
- Hard workouts are not the answer. In order to burn fat, slow down and exercise longer to get the body to use its own fat cells for fuel, rather than the glycogen stores in the muscles.

Whilst regular exercise is useful in weight management, on its own it is unlikely to bring about a significant reduction in weight. Significant and long-term weight reduction is best achieved by combining regular exercise with a sensible diet. The four stage programme illustrated in table 3.3 increases the exercise duration to a maximum of 90 minutes.

Section 3 : Training Programmes

Notes for Table 3.3

- i. The weight management programme sets an upper training intensity limit of 65% of MHR. You should comfortably be able to maintain a conversation at this intensity.
- ii. 2 x 10' UT2 18-20spm means row for 10 minutes in your UT2 heart rate band at 18-20 strokes per minutes, take a short break and then repeat.
- iii. This training programme increases in volume through each training period and from one period to the next. If you feel you need more time to recover a short rest of 3-4 days after each three week training cycle may well suffice.
- iv. When rowing for long periods on the machine, you may experience some stiffness in the back. Holding the back firm in a static position causes this. If you suffer from soreness in the back, get off the machine at least every 20 minutes and carry out a stretching routine. Exercises that strengthen the abdominal and back muscles, which control the posture, can also be carried out in conjunction with indoor rowing.
- v. The Indoor Rower, used properly, does not present a risk to the back and will help strengthen the back muscles. However, if you have a back injury it may be aggravated by long periods of indoor rowing. By following the guidelines of starting slowly and gradually building up the amount of time spent on the machine, you can be confident of a safe and enjoyable workout.
- vi. The effects of energy consumption are cumulative - the effect is the same whether you complete one hour continuously or break it down to 3 x 20 minutes.
- vii. Phases 3 & 4 are certainly not for everybody; many will find Phases 1 & 2 quite adequate. We recommend you seek professional medical advice before embarking on Phases 3 & 4, even if you have completed Phases 1 & 2 and experienced no problems.

Section 3 : Training Programmes

Table 3.3

Weight Management Programme			
Session	Light Week	Medium Week	Hard Week
PHASE 1			
1	10' UT2 18-20spm	15' UT2 18-20spm	15' UT2 18-20spm
2	15' UT2 18-20spm	20' UT2 18-20spm	20' UT2 18-20spm
3	2 x 10' UT2 18-20spm	2 x 10' UT2 18-20spm	2 x 15' UT2 18-20spm
4	15' UT2 18-20spm	15' UT2 18-20spm	20' UT2 18-20spm
5	20' UT2 18-20spm	20' UT2 18-20spm	25' UT2 18-20spm
PHASE 2			
1	20' UT2 18-20spm	20' UT2 18-20spm	2 x 15' UT2 18-20spm
2	25' UT2 18-20spm	25' UT2 18-20spm	30' UT2 18-20spm
3	2 x 15' UT2 18-20spm	2 x 20' UT2 18-20spm	2 x 20' UT2 18-20spm
4	20' UT2 18-20spm	30' UT2 18-20spm	30' UT2 18-20spm
5	30' UT2 18-20spm	35' UT2 18-20spm	40' UT2 18-20spm
PHASE 3			
1	30' UT2 18-20spm	40' UT2 18-20spm	2 x 25' UT2 18-20spm
2	40' UT2 18-20spm	45' UT2 18-20spm	50' UT2 118-20spm
3	2 x 20' UT2 18-20spm	2 x 25' UT2 18-20spm	2 x 30' UT2 18-20spm
4	30' UT2 18-20spm	35' UT2 18-20spm	40' UT2 18-20spm
5	40' UT2 18-20spm	50' UT2 18-20spm	60' UT2 18-20spm
PHASE 4			
1	50' UT2 18-20spm	60' UT2 18-20spm	75' UT2 18-20spm
2	3 x 20' UT2 18-20spm	3 x 25' UT2 18-20spm	2 x 30' UT2 18-20spm
3	40' UT2 18-20spm	50' UT2 18-20spm	60' UT2 18-20spm
4	2 x 25' UT2 18-20spm	2 x 30' UT2 18-20spm	2 x 40' UT2 18-20spm
5	60' UT2 18-20spm	75' UT2 18-20spm	90' UT2 18-20spm

4. 20 Minute Fitness

Target Group: People who have a limited amount of time for training.

The 20 Minute Fitness programme is based on the Wave Principle of Training, Heart Rate Training and the Training Bands (all of which are defined in Section 2.1 Training Intensity).

The session length, in terms of work, is up to 20 minutes but this does not include time for warm-up, cool down or stretching. Depending on the amount of rest you require, some sessions may overrun the allotted 20 minutes slightly.

This programme (Table 3.4) has been written for anybody who wishes to train from three to five times per week. If you train three times a week, follow the programme for sessions 1, 2 and 3. For four sessions add on Session 4, and for five sessions complete all Sessions 1-5.

Notes for Table 3.4

- i. 1 x 20' UT1 20spm means row for 20 minutes in your UT1 heart rate range at 20 strokes per minute.
- ii. 2 x 8' UT1 20spm means row for eight minutes in your UT1 heart rate range at 20 strokes per minute, with a short rest of three to four minutes between each piece of work.
- iii. 6 x 1' AN 32spm means row one minute intervals in your AN heart rate range, with at least one to two minutes rest between each piece of work.
- iv. Sessions 1-3 are fairly hard workouts as they are designed for people only completing three training sessions each week. The less training you do each week the harder the individual sessions need to be so that cumulatively you are doing enough work for it to be beneficial. As you complete more sessions per week the training load of the extra sessions can be reduced. Therefore sessions 4 & 5 are lighter workouts. When completing more than three sessions a week we recommend you adjust the sequence of the sessions to give a more balanced mix of light and hard sessions throughout the week.

Section 3 : Training Programmes

Table 3.4

20 Minute Fitness Programme, 3-5 Sessions per Week			
Session	Light Week	Medium Week	Hard Week
PREPARATION PERIOD			
1	1 x 20' UT1 20spm	1 x 20' UT1 22spm	1 x 20' UT1 24spm
2	2 x 8' UT1 22spm	2 x 8' UT1 23spm	2 x 8' UT1 24spm
3	1 x 20' UT1 20spm	1 x 20' UT1 22spm	1 x 20' UT1 24spm
4	2 x 8' UT1 22spm	2 x 8' UT1 23spm	1 x 20' UT1 24spm
5	1 x 20' UT2 18-20spm	1 x 20' UT2 18-20spm	1 x 20' UT2 18-20spm
DEVELOPMENT PERIOD			
1	2 x 8' AT 24spm	2 x 8' AT 25spm	2 x 8' AT 26spm
2	1 x 20' UT1 20spm	1 x 20' UT1 22spm	1 x 20' UT1 24spm
3	3 x 5' AT 26spm	3 x 5' AT 27spm	3 x 5' AT 28spm
4	1 x 20' UT1 22spm	1 x 20' UT1 23spm	1 x 20' UT1 24spm
5	1 x 20' UT2 18-20spm	1 x 20' UT2 18-20spm	1 x 20' UT2 18-20spm
CONSOLIDATION PERIOD			
1	3 x 4' TR 28spm	3 x 4' TR 28spm	3 x 4' TR 30spm
2	6 x 1' AN 32spm	6 x 1' AN 34spm	8 x 1' AN 36spm
3	4 x 2' TR 30spm	5 x 2' TR 32spm	6 x 2' TR 32spm
4	2 x 8' AT 24spm	2 x 8' AT 26spm	2 x 8' AT 28spm
5	1 x 20' UT1 20spm	1 x 20' UT1 22spm	1 x 20' UT1 24spm

5. 40 Minute Fitness

Target Group: People who can devote up to an hour to a training session.

The 40 Minute Fitness programme is based on the Wave Principle of Training, Heart Rate Training and the Training Bands (all of which are defined in Section 2.1 Training Intensity).

The session length, in terms of work, is up to 40 minutes but this does not include time for warm-up, cool down or stretching. Depending on the amount of rest you require, some sessions may overrun the allotted 40 minutes slightly.

This programme (Table 3.5) has been written for anybody who wishes to train from three to five times per week. If you train three times a week, follow the programme for sessions 1, 2 and 3. For four sessions add on Session 4, and for five sessions complete all Sessions 1-5.

Notes for Table 3.5

- i. 1 x 30' UT1 20spm means row for 30 minutes in your UT1 heart rate range, at 20 strokes per minute.
- ii. 3 x 7' AT 26spm means row for seven minutes in your AT heart rate range at 26 strokes per minute, take a short break of 3-5 minutes between each piece of work and repeat twice more.
- iii. 2 x (6 x 1') AN 32spm means row six one minute pieces in your AN heart rate range at 32 strokes per minute and then repeat the complete set. You should take at least one to two minutes rest between each one minute piece and five to ten minutes rest between the two sets.
- iv. Sessions 1-3 are fairly hard workouts as they are designed for people only completing three training sessions each week. The less training you do each week the harder the individual sessions need to be so that cumulatively you are doing enough work for it to be beneficial. As you complete more sessions per week the training load of the extra sessions can be reduced. Therefore sessions 4 & 5 are lighter workouts. When completing more than three sessions a week we recommend you adjust the sequence of the sessions to give a more balanced mix of light and hard sessions throughout the week.

Section 3 : Training Programmes

Table 3.5

40 Minute Fitness Programme, 3-5 Sessions per Week			
Session	Light Week	Medium Week	Hard Week
PREPARATION PERIOD			
1	1 x 30' UT1 20spm	1 x 30' UT1 20spm	1 x 30' UT1 22spm
2	3 x 10' UT1 20spm	3 x 10' UT1 22spm	3 x 10' UT1 24spm
3	2 x 15' UT1 20spm	2 x 15' UT1 22spm	2 x 15' UT1 24spm
4	3 x 10' UT1 22spm	3 x 10' UT1 23spm	3 x 10' UT1 24spm
5	1 x 30' UT2 18spm	1 x 40' UT2 18spm	1 x 40' UT2 20spm
DEVELOPMENT PERIOD			
1	3 x 7' AT 26spm	4 x 7' AT 26spm	4 x 7' AT 28spm
2	2 x 15' UT1 20spm	2 x 15' UT1 22spm	2 x 15' UT1 24spm
3	4 x 6' AT 26spm	4 x 6' AT 28spm	5 x 6' AT 28spm
4	3 x 10' UT1 22spm	3 x 10' UT1 23spm	3 x 10' UT1 24spm
5	1 x 40' UT2 18spm	1 x 40' UT2 20spm	1 x 40' UT2 20spm
CONSOLIDATION PERIOD			
1	5 x 3' TR 28spm	6 x 3' TR 28spm	6 x 3' TR 30spm
2	2 x (6 x 1') AN 32spm	3 x (6 x 45 sec) AN 34spm	3 x (6 x 45 sec) AN 36spm
3	6 x 2' TR 30spm	2 x (4 x 2') TR 30spm	2 x (4 x 2') TR 32spm
4	4 x 6' AT 26spm	4 x 6' AT 28spm	5 x 6' AT 28spm
5	3 x 10' UT1 20spm	3 x 10' UT1 22spm	3 x 10' UT1 24spm

6. 2,000m Race Training

Target Group: Anyone training for a 2,000m race.

People of all ages, from all walks of life and all levels of fitness have, in the past, competed in 2,000m indoor rowing races and the one consistent message we hear is that it's very hard! It doesn't matter whether you are an Olympic champion or a 'first-timer' to the machine, if you commit yourself fully to the task you will find yourself pushed right to your limit. That said, you will be far better equipped to cope with the physiological demands you are placing on your body if you prepare for the race in a systematic way. With this in mind we advise that if you've got less than 6 weeks to go to your race, and you've not been training, you should probably not go ahead. Tables 3.6 - 3.8 outline a series of pre-set programmes based on training 4, 5 or 6 sessions per week.

To structure your own programme refer to Section 2 Training Guidelines.

Section 3 : Training Programmes

Table 3.6

2,000m Race Training: 4 Sessions per Week			
Session	Light Week	Medium Week	Hard Week
PREPARATION			
1	2 x 20' UT1 20spm	2 x 20' UT1 22spm	2 x 20' UT1 24spm
2	1 x 30' UT1 22spm	1 x 40' UT1 22spm	4 x 10' UT1 24spm
3	3 x 10' UT1 22spm	3 x 15' UT1 22spm	3 x 20' UT1 22spm
4	1 x 30' UT1 20spm	1 x 30' UT1 22spm	1 x 30' UT1 24spm
PRE-COMPETITION			
1	2 x 10' AT 24spm	2 x 10' AT 26spm	2 x 10' AT 28spm
2	2 x 20' UT1 20spm	2 x 20' UT1 22spm	2 x 20' UT1 24spm
3	3 x 6' AT 24spm	3 x 6' AT 26spm	3 x 6' AT 28spm
4	3 x 10' UT1 22spm	3 x 15' UT1 22spm	3 x 20' UT1 22spm
COMPETITION			
1	3 x 4' TR 28spm	3 x 4' TR 30spm	3 x 4' TR 32spm
2	9 x 1' AN 32spm	9 x 1' AN 33spm	9 x 1' AN 34spm
3	4 x 6' AT 24spm	4 x 6' AT 26spm	4 x 6' AT 28spm
4	6 x 2' TR 28spm	6 x 2' TR 30spm	6 x 2' TR 32spm

Notes

- i. Always err on the side of caution in any training regime. These training examples are a guide only and are not appropriate to everyone. You need to use caution and know your own limits when assessing your ability to cope with training doses. Beginners on a training regime of three or four sessions a week may not be able to cope with the above.
- ii. To determine which training period you should be working in refer to Section 2, Tables 2.3 and 2.4

Section 3 : Training Programmes

Table 3.7

2,000m Race Training: 5 Sessions per Week			
Session	Light Week	Medium Week	Hard Week
PREPARATION			
1	2 x 20' UT1 20spm	2 x 20' UT1 22spm	2 x 20' UT1 24spm
2	1 x 30' UT1 22spm	1 x 40' UT1 22spm	4 x 10' UT1 24spm
3	1 x 60' UT2 18spm	1 x 60' UT2 18spm	1 x 60' UT2 18spm
4	3 x 10' UT1 22spm	3 x 15' UT1 22spm	3 x 20' UT1 22spm
5	1 x 30' UT1 20spm	1 x 30' UT1 22spm	1 x 30' UT1 24spm
PRE-COMPETITION			
1	2 x 10' AT 24spm	2 x 10' AT 26spm	2 x 10' AT 28spm
2	2 x 20' UT1 20spm	2 x 20' UT1 22spm	2 x 20' UT1 24spm
3	1 x 60' UT2 18spm	1 x 60' UT2 18spm	1 x 60' UT2 18spm
4	3 x 6' AT 24spm	3 x 6' AT 26spm	3 x 6' AT 28spm
5	3 x 10' UT1 22spm	3 x 15' UT1 22spm	3 x 20' UT1 22spm
COMPETITION			
1	3 x 4' TR 28spm	3 x 4' TR 30spm	3 x 4' TR 32spm
2	9 x 1' AN 32spm	9 x 1' AN 33spm	9 x 1' AN 34spm
3	3 x 10' UT1 20spm	3 x 10' UT1 22spm	3 x 10' UT1 24spm
4	4 x 6' AT 24spm	4 x 6' AT 26spm	4 x 6' AT 28spm
5	6 x 2' TR 28spm	6 x 2' TR 30spm	6 x 2' TR 32spm

Notes

- i. Always err on the side of caution in any training regime. These training examples are a guide only and are not appropriate to everyone. You need to use caution and know your own limits when assessing your ability to cope with training doses. Beginners on a training regime of three or four sessions a week may not be able to cope with the above.
- ii. To determine which training period you should be working in refer to Section 2, Tables 2.3 and 2.4

Section 3 : Training Programmes

Table 3.8

2,000m Race Training: 6 Sessions per Week			
Session	Light Week	Medium Week	Hard Week
PREPARATION			
1	2 x 20' UT1 20spm	2 x 20' UT1 22spm	2 x 20' UT1 24spm
2	1 x 30' UT1 22spm	1 x 40' UT1 22spm	4 x 10' UT1 24spm
3	1 x 60' UT2 18spm	1 x 60' UT2 18spm	1 x 60' UT2 18spm
4	3 x 10' UT1 22spm	3 x 15' UT1 22spm	3 x 20' UT1 22spm
5	1 x 60' UT2 20spm	1 x 60' UT2 20spm	1 x 60' UT2 20spm
6	1 x 30' UT1 20spm	1 x 30' UT1 22spm	1 x 30' UT1 24spm
PRE-COMPETITION			
1	2 x 10' AT 24spm	2 x 10' AT 26spm	2 x 10' AT 28spm
2	2 x 20' UT1 20spm	2 x 20' UT1 22spm	2 x 20' UT1 24spm
3	4 x 6' AT 24spm	4 x 6' AT 26spm	4 x 6' AT 28spm
4	1 x 60' UT2 18spm	1 x 60' UT2 18spm	1 x 60' UT2 18spm
5	3 x 6' AT 24spm	3 x 6' AT 26spm	3 x 6' AT 28spm
6	3 x 10' UT1 20spm	3 x 15' UT1 22spm	3 x 20' UT1 22spm
COMPETITION			
1	3 x 4' TR 28spm	3 x 4' TR 30spm	3 x 4' TR 32spm
2	9 x 1' AN 32spm	9 x 1' AN 33spm	9 x 1' AN 34spm
3	3 x 10' UT1 20spm	3 x 10' UT1 22spm	3 x 10' UT1 24spm
4	6 x 1.5' AN 32spm	6 x 1.5' AN 33spm	6 x 1.5' AN 34spm
5	4 x 6' AT 24spm	4 x 6' AT 26spm	4 x 6' AT 28spm
6	6 x 2' TR 28spm	6 x 2' TR 30spm	6 x 2' TR 32spm

Notes

- i. Always err on the side of caution in any training regime. These training examples are a guide only and are not appropriate to everyone. You need to use caution and know your own limits when assessing your ability to cope with training doses. Beginners on a training regime of three or four sessions a week may not be able to cope with the above.
- ii. To determine which training period you should be working in refer to Section 2, Tables 2.3 and 2.4

2,000m Race Strategy

For your interest and information we have included here a test protocol devised by the French Rowing Federation (FRF) which attempts to both maximise and predict 2,000m race performance. This protocol is undertaken the day before an athlete's 2,000m test. From the results the FRF then structure a race strategy for the athlete to follow during the race.

Test Protocol

The day before the 2,000m test, all athletes complete two 'maximum' tests, first over 100m, and then 500m. Between the two tests a 15 minute active recovery is necessary (low intensity rowing). After the 500m test athletes are required to complete another reasonably long period of low intensity rowing to ensure the body is well recovered.

The 100m test is used to analyse the maximum speed possible, whilst the 500m time is used to plan the race pace for the 2,000m test. Table 3.9 sets out the target pace per 500m based on the 500m test time. We have no information available on how the 100m test result impacts on race strategy.

Table 3.9

French Rowing Federation 2,000m Race Strategy (based on 500m Test)					
500m test	1st 500m (92%)	2nd 500m (88%)	3rd 500m(88%)	4th 500m(91%)	Predicted 2,000m
1:15	1:21.5	1:25.2	1:25.2	1:22.4	5:34.4
1:16	1:22.6	1:26.4	1:26.4	1:23.5	5:38.9
1:17	1:23.7	1:27.5	1:27.5	1:24.6	5:43.3
1:18	1:24.8	1:28.6	1:28.6	1:25.7	5:47.8
1:19	1:25.9	1:29.8	1:29.8	1:26.8	5:52.3
1:20	1:27.0	1:30.9	1:30.9	1:27.8	5:56.7
1:21	1:28.0	1:32.1	1:32.1	1:29.0	6:01.2
1:22	1:29.1	1:33.2	1:33.2	1:30.1	6:05.6
1:23	1:30.2	1:34.3	1:34.3	1:31.2	6:10.1
1:24	1:31.3	1:35.5	1:35.5	1:32.3	6:14.6
1:25	1:32.4	1:36.6	1:36.6	1:33.4	6:19.0
1:26	1:33.5	1:37.7	1:37.7	1:34.5	6:23.5
1:27	1:34.6	1:38.9	1:38.9	1:35.6	6:27.9
1:28	1:35.7	1:40.0	1:40.0	1:36.7	6:32.4
1:29	1:36.7	1:41.1	1:41.1	1:37.8	6:36.9
1:30	1:37.8	1:42.3	1:42.3	1:38.9	6:41.3
1:31	1:38.9	1:43.4	1:43.4	1:40.0	6:45.8
1:32	1:40.0	1:44.6	1:44.6	1:41.1	6:50.2
1:33	1:41.1	1:45.7	1:45.7	1:42.2	6:54.7
1:34	1:42.2	1:46.8	1:46.8	1:43.3	6:59.1
1:35	1:43.3	1:48.0	1:48.0	1:44.4	7:03.6
1:36	1:44.4	1:49.1	1:49.1	1:45.5	7:05.1
1:37	1:45.4	1:50.2	1:50.2	1:46.6	7:12.5
1:38	1:46.5	1:51.4	1:51.4	1:47.7	7:17.0
1:39	1:47.6	1:52.5	1:52.5	1:48.8	7:21.4
1:40	1:48.7	1:53.7	1:53.7	1:49.9	7:25.9
1:41	1:49.8	1:54.8	1:54.8	1:51.0	7:30.4
1:42	1:50.9	1:55.9	1:55.9	1:52.1	7:34.8
1:43	1:52.0	1:57.1	1:57.1	1:53.2	7:39.3
1:44	1:53.0	1:58.2	1:58.2	1:54.3	7:43.7
1:45	1:54.1	1:59.3	1:59.3	1:55.4	7:48.2
1:46	1:55.2	2:00.5	2:00.5	1:56.5	7:52.7
1:47	1:56.3	2:01.6	2:01.6	1:57.6	7:57.1
1:48	1:57.4	2:02.7	2:02.7	1:58.7	8:01.6
1:49	1:58.5	2:03.9	2:03.9	1:59.8	8:06.0
1:50	1:59.6	2:05.0	2:05.0	2:00.9	8:10.5
1:51	2:00.7	2:06.2	2:06.2	2:02.0	8:14.9
1:52	2:01.7	2:07.3	2:07.3	2:03.1	8:19.4
1:53	2:02.8	2:08.4	2:08.4	2:04.2	8:23.9
1:54	2:03.9	2:09.6	2:09.6	2:05.3	8:28.3
1:55	2:05.0	2:10.7	2:10.7	2:06.4	8:32.8
1:56	2:06.1	2:11.8	2:11.8	2:07.5	8:37.2
1:57	2:07.2	2:13.0	2:13.0	2:08.6	8:41.7
1:58	2:08.3	2:14.1	2:14.1	2:09.7	8:46.2
1:59	2:09.4	2:15.2	2:15.2	2:10.8	8:50.6
2:00	2:10.4	2:16.4	2:16.4	2:11.9	8:55.1
2:01	2:11.5	2:17.5	2:17.5	2:13.0	8:59.5
2:02	2:12.6	2:18.7	2:18.7	2:14.1	9:04.0
2:03	2:13.7	2:19.8	2:19.8	2:15.2	9:08.5
2:04	2:14.8	2:20.9	2:20.9	2:16.3	9:12.9
2:05	2:15.9	2:22.1	2:22.1	2:17.4	9:17.4
2:06	2:17.0	2:23.2	2:23.2	2:18.5	9:21.8
2:07	2:18.0	2:24.3	2:24.3	2:19.6	9:26.3
2:08	2:19.1	2:25.5	2:25.5	2:20.7	9:30.8
2:09	2:20.2	2:26.6	2:26.6	2:21.8	9:35.2
2:10	2:21.3	2:27.7	2:27.7	2:22.9	9:39.7
2:11	2:22.4	2:28.9	2:28.9	2:24.0	9:44.1
2:12	2:23.5	2:30.0	2:30.0	2:25.1	9:48.6
2:13	2:24.6	2:31.2	2:31.2	2:26.2	9:53.0
2:14	2:25.7	2:32.3	2:32.3	2:27.3	9:57.5
2:15	2:26.7	2:33.4	2:33.4	2:28.4	10:02.0
2:16	2:27.8	2:34.6	2:34.6	2:29.5	10:06.4
2:17	2:28.9	2:35.7	2:35.7	2:30.6	10:10.9
2:18	2:30.0	2:36.8	2:36.8	2:31.7	10:15.3
2:19	2:31.1	2:38.0	2:38.0	2:32.8	10:19.8
2:20	2:32.2	2:39.1	2:39.1	2:33.9	10:24.3

7. Marathon Training

Structuring a Marathon Programme

Indoor rowing marathons are very demanding and require careful preparation to ensure the best result. Rather than structuring your training programme on the Training Bands model we recommend you base it around your predicted marathon pace. If you have already completed a marathon, then you know what your pace will be. If you are going for a personal best then base your training around the pace of your new target. If you have never done a marathon you will need to set a pace. This can be estimated from your 5,000m time, using table 3.11.

The programme outlined in this guide is based on a series of training blocks illustrated below in table 3.10, with each block designed to develop the various physiological responses to the demands of a marathon.

Table 3.10

Marathon Training Programme Structure						
	Week 1-4	Week 5-8	Week 9-12	Week 13-16	Week 17-20	Week 21-24
General Endurance						
VO ₂ Max						
Strength						
Power						
Lactate Threshold						
Taper						

Tables 3.12 - 3.16 set out a six month marathon training programme based on the structure illustrated above for someone wishing to train five times a week.

Section 3 : Training Programmes

Table 3.11

Estimated Marathon Pace Based on 5,000m Pace							
5,000m		Predicted 10,000m		Predicted Half Marathon		Predicted Marathon	
Pace	Time	Pace	Time	Pace	Time	Pace	Time
1:30	15:00	1:37	32:24	1:45	1.14	1:53	2.39
1:35	15:50	1:43	34:12	1:51	1.18	2:00	2.48
1:40	16:40	1:48	36:00	1:57	1.22	2:06	2.57
1:45	17:30	1:53	37:48	2:02	1.26	2:12	3.06
1:50	18:20	1:59	39:36	2:08	1.30	2:19	3.15
1:55	19:10	2:04	41:24	2:14	1.34	2:25	3.24
2:00	20:00	2:10	43:12	2:20	1.38	2:31	3.33
2:05	20:50	2:15	45:00	2:26	1.43	2:37	3.41
2:10	21:40	2:20	46:48	2:32	1.47	2:44	3.50
2:15	22:30	2:26	48:36	2:37	1.51	2:50	3.59
2:20	23:20	2:31	50:24	2:43	1.55	2:56	4.08
2:25	24:10	2:37	52:12	2:49	1.59	3:03	4.17
2:30	25:00	2:42	54:00	2:55	2.03	3:09	4.26
2:35	25:50	2:47	55:48	3:01	2.07	3:15	4.35
2:40	26:40	2:53	57:36	3:07	2.11	3:22	4.43
2:45	27:30	2:58	59:24	3:12	2.15	3:28	4.52
2:50	28:20	3:04	1.01:12	3:19	2.19	3:34	5.01
2:55	29:10	3:09	1.03:00	3:24	2.24	3:40	5.10
3:00	30:00	3:14	1.04:48	3:30	2.28	3:47	5.19

Notes

The predicted 10,000m, half marathon and marathon times are guides and purposely err on the side of caution.

Section 3 : Training Programmes

General Endurance (Weeks 1-4)

For the first four weeks of the programme the main emphasis should be on general endurance. This is best achieved by steady state rowing at your predicted marathon pace, gradually increasing the time spent on the machine from 20 minutes to one hour. It follows the Wave Principle of Training (see Section 2.1 Training Intensity), building the training load over the first three weeks, with the fourth week light to ensure full adaptation takes place in the body before you move on to the next phase.

VO₂ Max (Weeks 1-8 and 13-20)

A persons VO₂ Max is a measure of their ability to use oxygen. Therefore developing this is fundamental to improving performance, particularly in endurance events.

5,000m pace is the best intensity for improving VO₂ Max. Work time can be up to two to three times your 5,000m time broken down to intervals of between five and ten minutes. A typical example would be 4 x Alternate (6' @ 5kP / 8' @ MP) which means six minutes at 5,000m pace followed by eight minutes at marathon pace, repeated four times (Total work = 56 minutes) .

Strength (Weeks 5-8)

The next phase is strength. This is important in the development of posture to remove inefficient movement of the body. During the Drive phase the trunk has to be held firm so that all the power developed through the legs is transmitted to the handle increasing the efficiency of the stroke. The more efficient the stroke the longer you can continue to exercise.

To develop strength put the damper lever up two to four levels from your standard setting and pull as hard as you can at a low stroke rate (18-20spm) for 30 strokes. Build up the number of sets from five (150 strokes) to 15 (three sets of five; 450 strokes). This type of training should be alternated with long intervals at your 10,000m pace.

Muscles need a long recovery time to benefit fully from strength training so sessions should be restricted to a maximum of three a week. We have included three in the programme outlined, the other two being VO₂ max sessions.

Power (Weeks 9-12)

Power is the rate at which you can use your strength so, having improved your basic strength, you now have to develop some speed. This is achieved by slightly reducing the load and increasing the strokes per minute.

We recommend increasing the stroke rate for periods up to three minutes. four to six sets of three minutes at stroke rate 30 will help develop power and can be alternated with medium length intervals at your 5,000m pace. The benefit of this type of training will be felt when you come on to marathon pace which will then seem relatively easy.

Section 3 : Training Programmes

Lactate Threshold (Weeks 9-20)

The lactate threshold is the point where the energy demands of the tasks can no longer be met by the aerobic system so, it has to be supplemented by the anaerobic system. This results in the accumulation of lactic acid in the blood stream as the body cannot metabolise it at the rate at which it is being produced. In an unfit person the lactate threshold could be between 50-60% of MHR, whereas in a fit person it could be around 85%. The fit person can carry out far more work than the unfit person before experiencing the debilitating effects of lactate accumulation.

The aim is to improve the lactate threshold as well as to increase the time spent on the machine. The best way to do this is to train for about an hour with your heart rate elevated to the threshold. You will see in this programme that the training loads vary so that you are just below the threshold and just above it. This form of alternating will allow you to train in the threshold region for a longer period of time. The time range of lactate threshold training should be from 45-90 minutes and a typical one hour session could be 20 minutes at 10,000m pace, 20 minutes at marathon pace finishing with a further 20 minutes at half marathon pace.

Taper (Weeks 21-24)

You will need four weeks to taper for a marathon. What you do in the last four weeks could have a bigger effect on your marathon performance than the previous twenty, largely because there is more scope to get it wrong. The long taper does present the opportunity to top up on some parts of the training that may not have gone so well, so if you missed any part of the 24 week programme you can fit it in here. However you must **not** do a practice marathon or any ultra-long pieces as the muscle recovery time is up to ten days.

The key to a good marathon performance is fitness and if you are fit you will be able to complete the distance. The best way to maintain fitness in the taper is with high intensity not high volume.

The outlined tapering programme is a general one and assumes the previous 20 weeks have gone well. It consists of a mix of all of the types of training bands and the damper settings should be the same as they were in the previous weeks for each type of training.

Section 3 : Training Programmes

Table 3.12

Marathon Training Weeks 1-4: General Endurance/VO ₂ Max									
		Week 1		Week 2		Week 3		Week 4	
Sess.	Type	D	Work	D	Work	D	Work	D	Work
1	GE	SS	20' @ MP	SS	30' @ MP	SS	40' @ MP	SS	20' @ MP
2	VO ₂ Max	SS	40' @ MP	SS	3 x Alternate (4' @ 5kP / 8' @ MP)	SS	3 x Alternate (6' @ 5kP / 8' @ MP)	SS	3 x Alternate (5' @ 5kP / 8' @ MP)
3	GE	SS	30' @ MP	SS	40' @ MP	SS	50' @ MP	SS	20' @ MP
4	GE	SS	50' @ MP	SS	60' @ MP	SS	60' @ MP	SS	45' @ MP
5	VO ₂ Max	SS	4 x Alternate (5' @ 5kP / 8' @ MP)	SS	4 x Alternate (6' @ 5kP / 8' @ MP)	SS	3 x Alternate (8' @ 5kP / 12' @ MP)	SS	3 x Alternate (5' @ 5kP / 8' @ MP)

Table 3.13

Marathon Training Weeks 5-8: Strength/VO ₂ Max									
		Week 5		Week 6		Week 7		Week 8	
Sess.	Type	D	Work	D	Work	D	Work	D	Work
1	Strength	+2	1 x (10 x 10)	+3	2 x (6 x 10)	+4	3 x (6 x 10)	+4	1 x (10 x 10)
2	VO ₂ Max	SS	2 x Alternate (6' @ 5kP / 8' @ MP)	SS	2 x Alternate (8' @ 5kP / 12' @ MP)	SS	3 x Alternate (6' @ 5kP / 8' @ MP)	SS	3 x Alternate (5' @ 5kP / 8' @ MP)
3	Strength	+2	1 x (10 x 10)	+3	2 x (8 x 10)	+4	3 x (8 x 10)	+4	1 x (10 x 10)
4	Strength	+2	1 x (10 x 10)	+3	3 x (10 x 10)	+3	3 x (10 x 10)	+4	1 x (10 x 10)
5	VO ₂ Max	SS	3 x Alternate (5' @ 5kP / 8' @ MP)	SS	4 x Alternate (6' @ 5kP / 8' @ MP)	SS	3 x Alternate (8' @ 5kP / 12' @ MP)	SS	3 x Alternate (5' @ 5kP / 8' @ MP)

Section 3 : Training Programmes

Table 3.14

Marathon Training Weeks 9-12: Power/Lactate Threshold									
		Week 9		Week 10		Week 11		Week 12	
Sess.	Type	D	Work	D	Work	D	Work	D	Work
1	LT	SS	15' @ MP / 15' @ 10kP / 15' @ HMP	SS	20' @ MP / 20' @ 10kP / 20' @ HMP	SS	30' @ MP / 30' @ 10kP / 30' @ HMP	SS	20' @ MP / 20' @ 10kP / 20' @ HMP
2	Power	+2	2 x (6 x 1' / 2') @ 30spm	+2	3 x (6 x 1' / 2') @ 32spm	+2	8 x 90 sec / 3' @ 34spm	+2	4 x 90 sec / 3' @ 32spm
3	LT	SS	Repeat Session 1	SS	Repeat Session 1	SS	Repeat Session 1	SS	Repeat Session 1
4	Power	+1	4 x 3' / 5' @ 30spm	+1	4 x 3' / 5' @ 32spm	+1	4 x 3' / 5' @ 34spm	+1	4 x 3' / 5' @ 30spm
5	Power	+2	2 x (6 x 1' / 2') @ 30spm	+2	3 x (6 x 1' / 2') @ 32spm	+2	8 x 90 sec / 3' @ 34spm	+2	4 x 90 sec / 3' @ 36spm

Table 3.15

Marathon Training Weeks 13-20: Lactate Threshold/VO ₂ Max									
		Weeks 13 & 17		Weeks 14 & 18		Weeks 15 & 19		Weeks 16 & 20	
Sess.	Type	D	Work	D	Work	D	Work	D	Work
1	LT	SS	60' Alternate (10' @ 10kP / 10' @ MP)	SS	80' Alternate (10' @ 10kP / 15' @ MP / 15' @ HMP)	SS	90' Alternate (15' @ 10kP / 15' @ MP / 15' @ HMP)	SS	60' Alternate (10' @ 10kP / 10' @ MP)
2	VO ₂ Max	SS	4 x Alternate (5' @ 5kP / 8' @ MP)	SS	4 x Alternate (6' @ 5kP / 8' @ MP)	SS	4 x Alternate (8' @ 5kP / 12' @ MP)	SS	4 x Alternate (5' @ 5kP / 8' @ MP)
3	LT	SS	15' @ MP / 15' @ 10kP / 15' @ HMP	SS	20' @ MP / 20' @ 10kP / 20' @ HMP	SS	25' @ MP / 25' @ 10kP / 25' @ HMP	SS	15' @ MP / 15' @ 10kP / 15' @ HMP
4	LT	SS	Repeat Session 1	SS	Repeat Session 1	SS	Repeat Session 1	SS	Repeat Session 1
5	VO ₂ Max	SS	3 x Alternate (6' @ 10kP / 8' @ MP)	SS	3 x Alternate (8' @ 5kP / 12' @ MP)	SS	3 x Alternate (10' @ 5kP / 15' @ MP)	SS	3 x Alternate (6' @ 5kP / 8' @ MP)

Section 3 : Training Programmes

Table 3.16

Marathon Training Weeks 21-24: Taper								
Week 21			Week 22		Week 23		Week 24	
Session	D	Work	D	Work	D	Work	D	Work
1	SS	60' @ HMP	SS	60' @ MP	SS	60' @ MP	SS	45' @ MP
2	+2	20' @ MP & (2 x 3' / 5') @ 32spm	+2	30' @ 10kP & (4 x 1' / 2') @ 34spm	SS	2 x Alternate (10' @ 5kP / 20' @ MP)	SS	10' @ 5kP / 20' @ HMP
3	SS	(5 x 5' / 5') @ 10kP	SS	20' @ 5kP / 20' @ 10kP	+2	30' @ HMP (2 x 90 sec / 3' @ 36spm)	+2	30' @ HMP & (2 x 90 sec / 3') @ 36spm
4	+2	30' @ MP & (3 x 3' / 5') @ 32 spm	+2	30' @ HMP & (6 x 1' / 2') @ 36 spm	+2	30' @ HMP & (6 x 1' / 2') @ 36 spm	SS	20' @ MP
5	+1	20' @ 10kP & (6 x 1' / 2') @ 34spm	+1	30' @ HMP & (4 x 90 sec / 3') @ 36spm	+1	30' @ HMP & (6 x 1' / 2') @ 38spm	SS	Race

Section 3 : Training Programmes

Notes for Tables 3.12 - 3.16

General Notes

- i. D means damper setting.
- ii. SS means your standard, or preferred, setting of the damper lever (1-10).
- iii. +2 means set the damper at two levels higher than your standard setting. So, if you usually row at damper setting 3, increase it by two levels to damper setting 5.
- iv. 5kP means your predicted 5,000m pace.
- v. 10kP means your predicted 10,000m pace.
- vi. HMP means your predicted half marathon pace.
- vii. MP means your predicted marathon pace.

Table 3.12 - General Endurance/VO₂ Max

- i. 30' @ MP means row for 30 minutes at your predicted marathon pace.
- ii. 3 x Alternate (5' @ 5kP / 8' @ MP) means row for 5 minutes at 5,000m pace followed by 8 minutes at your predicted marathon pace and repeat 3 times.

Table 3.13 - Strength/VO₂ Max

- i. 1 x (10 x 10) means row 10 strokes 'flat out', recover by rowing lightly until heart rate is below 75% of MHR, and repeat 10 times.
- ii. 2 x (6 x 10) means row 10 strokes 'flat out', recover by rowing lightly until heart rate is below 75% of MHR and repeat 6 times. Then row lightly for 5-10 minutes and repeat the set.
- iii. 2 x Alternate (6' @ 5kP / 8' @ MP) means row for six minutes at 5,000m pace followed by eight minutes at your predicted marathon pace, twice.

Table 3.14 - Power/Lactate Threshold

- i. 15' @ MP / 15' @ 10kP / 15' @ HMP means row continuously for 45 minutes. The first 15 minutes at your predicted marathon pace, the next 15 minutes at 10,000m pace and the last 15 minutes at half marathon pace.
- ii. 2 x (6 x 1' / 2') @ 30spm means row hard for one minute at 30 strokes per minute, then row lightly for 2 minutes and repeat this six times. Take a break (5-10 minutes of light rowing) and repeat the set.
- iii. 8 x 90 sec / 3' @ 34spm means row hard for 90 seconds at 34 strokes per minute, then row lightly for 3 minutes and repeat this eight times.
- iv. 4 x 3' / 5' @ 30spm means row hard for 3 minutes @ 30 strokes per minute, then row lightly for 5 minutes and repeat this four times.

Table 3.15 - Lactate Threshold/VO₂ Max

- i. 60' Alternate (10' @ 10kP / 10' @ MP) means row for 10 minutes at 10,000m pace, then row 10 minutes at your predicted marathon pace. Keep alternating until you have completed 60 minutes of continuous rowing.
- ii. 4 x Alternate (5' @ 5kP / 8' @ MP) means row 5 minutes at 5,000m pace followed by 8 minutes at your predicted marathon pace. Keep alternating until you have completed four sets.
- iii. 15' @ MP / 15' @ 10kP / 15' @ HMP means row continuously for 45 minutes. The first 15 minutes at your predicted marathon pace, the next 15 minutes at 10,000m pace and the last 15 minutes at half marathon pace.

Table 3.16 - Taper

- i. 20' @ MP & (2 x 3' / 5') @ 32spm means row 20 minutes at your predicted marathon pace. Then complete your session with two hard 3 minute rows at 32 strokes per minute with 5 minutes light rowing in between.
- ii. (5 x 5' / 5') @ 10kP means row 5 minutes at 10,000m pace followed by 5 minutes light rowing. Keep alternating until you have completed 5 sets.
- iii. 30' @ HMP @ (6 x 1' / 2') @ 36spm means row for 30 minutes at half marathon pace. Then complete your session with 6 hard one minute rows at 36 strokes per minute with 2 minutes light rowing between each one minute row.

8. Cross-Training

Indoor Rowing as a Cross-Training Tool

For all athletes the problem of maintaining a training regime which is effective and sustainable is a recurrent one. In addition to the specific training relevant to the particular activity, a good all-round level of aerobic fitness is essential.

The Indoor Rower has long been acknowledged as an excellent means of improving both aerobic and anaerobic fitness since it exercises all major muscle groups in a complete range of intensities. Also, with careful programming, you can replicate the physiological demands of diverse activities on the one machine.

From a physiological point of view, different sports can be identified as either predominantly aerobically biased or anaerobically biased. There is a popular misconception that the two are quite separate, whereas aerobic and anaerobic exercise are two points on a continuum separated by the intensity of the exercise. Consequently, most sport is a combination of both, but to maximise training time, you should know where on the continuum to concentrate your effort.

Due to its versatility, the Indoor Rower can complement training in a wide range of sporting activities. For this reason, sports which require a high level of aerobic fitness and endurance - such as distance running, cross-country skiing, cycling, and distance swimming - can benefit just as much as sports which require explosive power - such as sprinting, athletic field events, rugby and weight-lifting.

Meaningful cross-training programmes can also be carried out by those sports which require a combination of both aerobic and anaerobic energy, such as team sports, on-water rowing and middle-distance running.

Here are some benefits of using indoor rowing to complement and enhance your training:

- It adds variety to your programme.
- It offers a time-efficient method of aerobic improvement by using large muscle mass.
- It can provide excellent anaerobic work-outs complementary to explosive power sport training.
- It offers all weather training to cope with times when conditions prohibit outdoor activities.
- It is weight-bearing and non-jarring and so can be a safe and effective way of training whilst recovering from illness or injury.
- Positive reinforcement can be gained by tracking improvement via the performance monitor.
- It is transportable, so can be used either at home or at other locations.

Energy Systems

To help you produce cross-training programmes, it may be useful to go over what is happening to the body during exercise, since it is these processes that we want to improve through our training regimes. They can be defined in three stages: anaerobic alactate, anaerobic and aerobic.

Stage 1 - Anaerobic Alactate Energy Production

To enable any form of muscular contraction energy is required. This is initially provided by a limited supply of adenosine triphosphate (ATP), which is stored in the muscle. ATP initiates a complex chemical reaction that provides energy. Because there is only enough ATP for about two seconds of maximal effort, ATP has to be regenerated very quickly to allow exercise to continue. At this initial stage of exercise, ATP is re-synthesised by breaking down creatine phosphate (CP), which is another high-energy substance, stored in the muscle. Like ATP there is a very limited store of CP in the muscle - about four or five seconds of maximum effort. This is known as the anaerobic alactate stage of energy production.

Stage 2 - Anaerobic Energy Production

To continue to exercise beyond the anaerobic alactate stage, we need a continued supply of ATP. So, before we have used up the entire store of CP, ATP will be provided by the breakdown of carbohydrates, in the form of glycogen stored in the liver and muscles, to pyruvic acid.

With the production of pyruvic acid, the aerobic system comes into action by using the oxygen carried in the blood to oxidise the pyruvic acid. When pyruvic acid production exceeds the ability of the aerobic system to metabolise it, then lactic acid is formed and accumulates in the muscles. This is the anaerobic stage, sometimes called the lactacid energy system, and will allow maximal effort up to about one minute, before the accumulation of lactic acid brings muscular contraction to a halt.

Stage 3 - Aerobic Energy Production

The aerobic energy system, oxygen transport, is relatively slow to react to the demands of exercise. However, because of its ability to use fat as fuel, of which the body has a plentiful supply, it is very efficient in the production of ATP. Exercise performance during long periods of exercise will depend on the ability of the aerobic system to deliver oxygen to the muscles.

If the intended exercise session is to last beyond one minute or so then the intensity has to be reduced so that the energy demands can be met by the aerobic system. A person is said to be working aerobically when the oxygen supply to the muscles is sufficient to meet the energy demands of the activity.

Muscular Development

The physiological changes that the three energy production systems cause in the body are the reason we use different training bands to bring about a specific improvement in performance. When deciding on a training regime, you should start by identifying the physical demands of the activity you are involved in to define where on the continuum you should focus your training.

By training in the appropriate bands, performance in those bands can be developed and improved. Changes in the muscle make up, which may or may not be desirable, can also take place.

The muscles are made up of three different types of fibres: slow twitch, which works aerobically; fast twitch 2b which works anaerobically; and fast twitch 2a, which can be trained to do either. By performing long periods of low intensity training, conversion of the type 2a fibres to work aerobically will take place. This will have the benefit of delaying the onset of lactic acid accumulation.

There is a price though, and that is the reduction of explosive anaerobic power. In sports where explosive power is a vital element, then training at a high intensity will condition the fast twitch 2a fibres to work anaerobically. The effect of this will be to improve the body's ability to shunt the lactic acid away and to improve the athlete's tolerance to high levels of lactic acid.

Training the Energy Systems

Anaerobic Alactate Training

Development of the anaerobic alactate system. The exercise pattern should be a low number of hard strokes at a high stroke rate, interspersed with some light ones.

Example: 3 x (10 /5 x 10) AN 34spm. Damper setting: 3-5

Row 10 strokes hard at 34 strokes per minute followed by five strokes light repeated 10 times, rest then repeat the whole process twice more, giving a total of 300 hard strokes. During the hard stroke phase, the heart rate will soar but, unlike during longer intervals, there will be no lactic acid accumulation. Progression would lead up to 3 x (17/7 x 10), 32-36 spm.

Anaerobic Training

Development of explosive power. The exercise pattern should be a series of high intensity intervals of between 30-60 seconds duration. Work to rest ratio 1:2.

Example: 2 x (45 sec/90 sec x 8) AN 32 spm. Damper setting: 8-10

Row 45 seconds maximum effort (this will cause high lactic acid levels) followed by 90 seconds of very light and relaxed rowing to allow the shunt mechanism to work. Repeat up to eight times, then rest for five minutes and then repeat. Progression is indicated by improved power output measured on the monitor during hard strokes. Maintaining a higher output throughout the session indicates greater lactate tolerance.

Aerobic Training

Development of endurance. For aerobic training the monitoring of output is vital. Heart rate is the simplest and most practical way to control work intensity as it increases with an increase in physical output. This is perhaps more important during long periods of aerobic training to ensure that you stay in the correct band. Aerobic exercise intensity should be carried out at between 65-85% of MHR continuously for a duration of 20-90 minutes depending on the fitness level of the athlete. The damper setting should be quite low, enabling the athlete to row with a flowing rhythm.

Blood Washout/Regeneration

Another excellent use of the machine is blood washout. After strenuous exercise, muscle damage and small lesions can occur, especially for those involved in contact sports. As a result, debris accumulates in the muscle leading to soreness and muscle stiffness. A period of low intensity rowing, not exceeding 20 minutes, keeping the heart rate slightly elevated at 65% of maximum, increases the blood flow through the muscle. This not only speeds up the metabolisation of accumulated lactic acid but also carries away any debris, thereby aiding recovery.



Section 4 :

Monitoring

Progress

1. Baseline Tests
2. Step Tests

1. Baseline Tests

Whatever your training goals you will want to know how you are progressing. A simple way to keep a check on your progress is to do some baseline tests at regular intervals during your training. Every two or three months is generally sufficient, though you may wish to update information more frequently, say every six weeks.

Outlined below are a series of monitoring tests. The first four can be done by anyone who is in good health and reasonably fit, but Test 5 - The Step Test is very demanding and intended for those who are fit and in serious training for competition.

Test 1 - Check Your Heart Rate

Record your resting heart rate (RHR) first thing in the morning. As your fitness improves, your RHR should progressively come down. A sudden increase of around 5 beats per minute could signal the onset of illness before other symptoms appear. It may also indicate that you may not be coping well with the training load. In this instance, suspend training and seek professional advice.

Test 2 - Timed Pieces

Select a set piece - time or distance (i.e. four minutes or 1,000m) - and record your performance as indicated on the performance monitor. Intervals of no less than six weeks are recommended between test pieces.

Test 3 - Anaerobic Capacity Test

This is a 20 second test which monitors the ability of the athlete to produce a lot of power in a short period of time. Set the damper at 5, the monitor on 20 seconds and row at maximum power and high rate. Record the distance covered.

Test 4 - Maximum Power Test

This is a five stroke test which measures the peak power produced. Set the damper at 5, the monitor on 500m/ Pace and build the intensity and stroke rate over three strokes, then row at maximum power and speed for five strokes. Record the fastest pace (lowest 500m split). Make sure you row full length strokes during this test.

Test 5 - Step Test (for competitors only)

This is an incremental step test used to determine the athlete's current anaerobic threshold. It is physically **very** demanding, but does give a lot of information. You will need a heart rate monitor linked to the Indoor Rower (see 4.2 Step Test).

2. Step Test

Test Protocol

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 3.5 ml/kg/min.

The Step Test steps used for this test are displayed in Table 4.1 in terms of Pace/500m and approximately relate to 25 watts/1 Met increments. The test consists of five 4 minute pieces, each rowed at a consistent 500m pace. The load is increased for each step as shown in Table 4.1.

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 and record the details as illustrated in Tables 4.2 and 4.3. Note: if the PM2 monitor is set for four minutes work and 30 seconds rest, all information is stored for recording at the end of the test (see Section 5.1 The Performance Monitor). During each step, the heart rate will rise, but should stabilise after around three minutes. This is called steady state.

In subsequent tests, improvement in endurance is indicated when you find that your heart rate is lower for any given step; your heart is doing less work for the same pace/effort.

How to Select Steps for the Step Test

Table 4.1

500m Pace/Watts Conversion Table												
500m	4:24	3:25	2:57	2:39	2:27	2:18	2:09	2:04	1:59	1:54	1:50	1:47
Watts	25	50	75	100	125	150	175	200	225	250	275	300
500m	1:44	1:41	1:39	1:36	1:34	1:32	1:30	1:29	1:27	1:26	1:24	1:23
Watts	325	350	375	400	425	450	475	500	525	550	575	600

To determine the appropriate start level, you will need to know your current 2,000m time. Using table 4.1, select the nearest step to your 500m split time for 2,000m. To determine your 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 which should be performed flat out to elicit a predicted 2,000m time. If your 2,000m time is slower than 9:30 you must select 4:24 as your Step 1 as this is the lowest starting point for the Step Test.

Section 4 : Monitoring Progress

The following is an example of an athlete who rows 2,000m in 6:32. Average 500m split = 1:38. Nearest split below this figure is 1:39. Starting level (Step 1) is six steps back = 1:59. Step 2 = 1:54. Step 3 = 1:50. Step 4 = 1:47 (just above anaerobic threshold). Step 5 is done flat out to give a predicted 2,000m time.

Table 4.2

First Test Results					
Date: 18/11/98	Step 1	Step 2	Step 3	Step 4	Step 5
Set Pace/500m	1:59	1:54	1:50	1:47	MAX
Distance (m)	1008	1051	1090	1122	1221
Stroke Rate (spm)	23	24	25	26	31
Heart Rate (bpm)	151	165	177	183	194
Actual Pace/500m	1:59	1:54	1:50	1:47	1:38.2

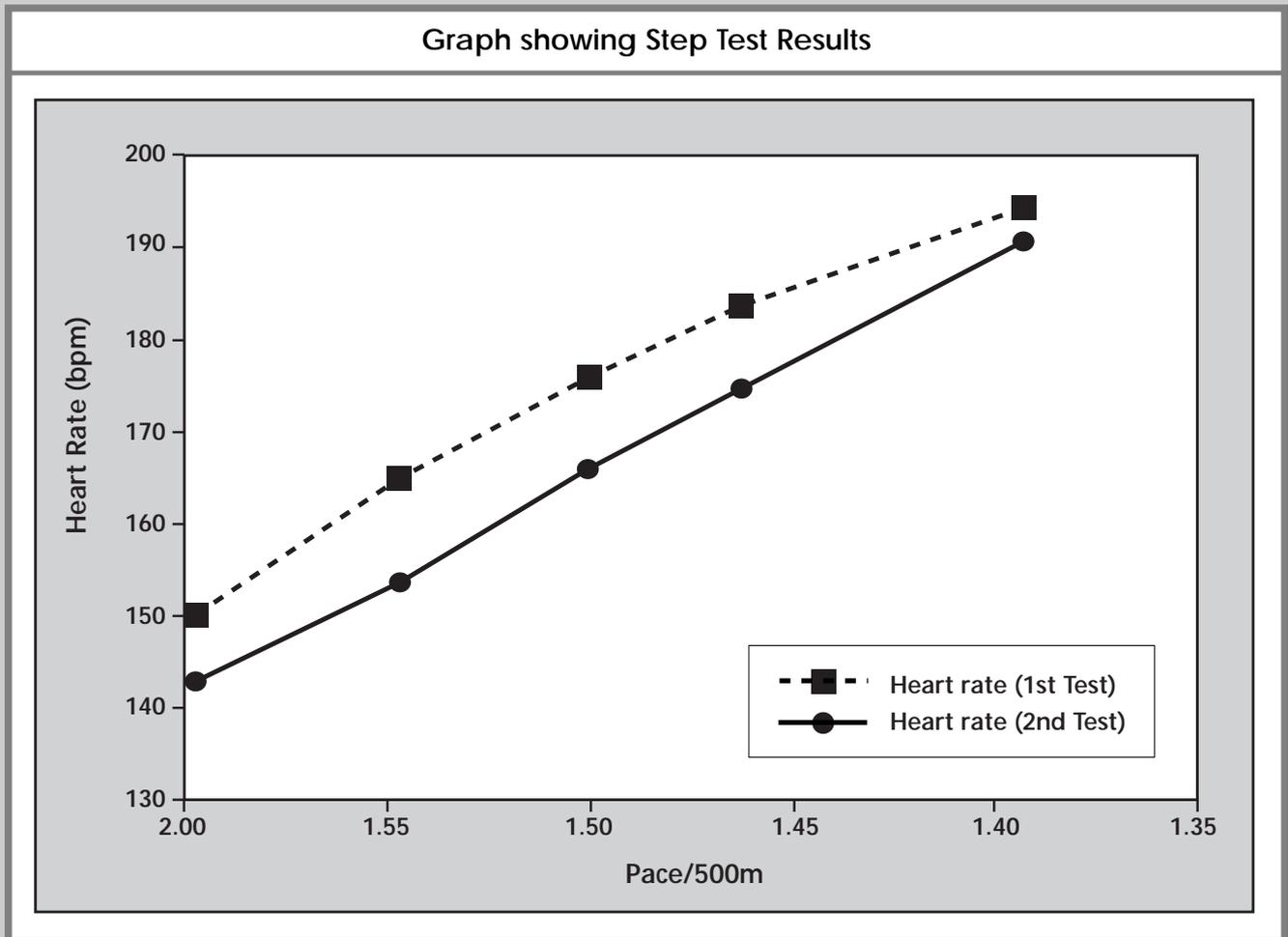
Table 4.3

Second Test Results					
Date: 23/07/99	Step 1	Step 2	Step 3	Step 4	Step 5
Set Pace/500m	1:59	1:54	1:50	1:47	MAX
Distance (m)	1010	1050	1088	1123	1232
Stroke Rate (spm)	22	24	25	25	32
Heart Rate (bpm)	143	154	166	175	189
Actual Pace/500m	1:59	1:54	1:50	1:47	1:37.4

Section 4 : Monitoring Progress

The graph below (Table 4.4) shows how the plotted line moves to the right. This indicates that the training programme has had a positive impact in terms of increasing this athlete's ability to perform at a lower heart rate for a given work load.

Table 4.4





Section 5 :

Appendix

1. The Performance Monitor
2. The Damper Lever
3. Pace Guide
4. Training Log
5. Concept II Incentives

1. The Performance Monitor

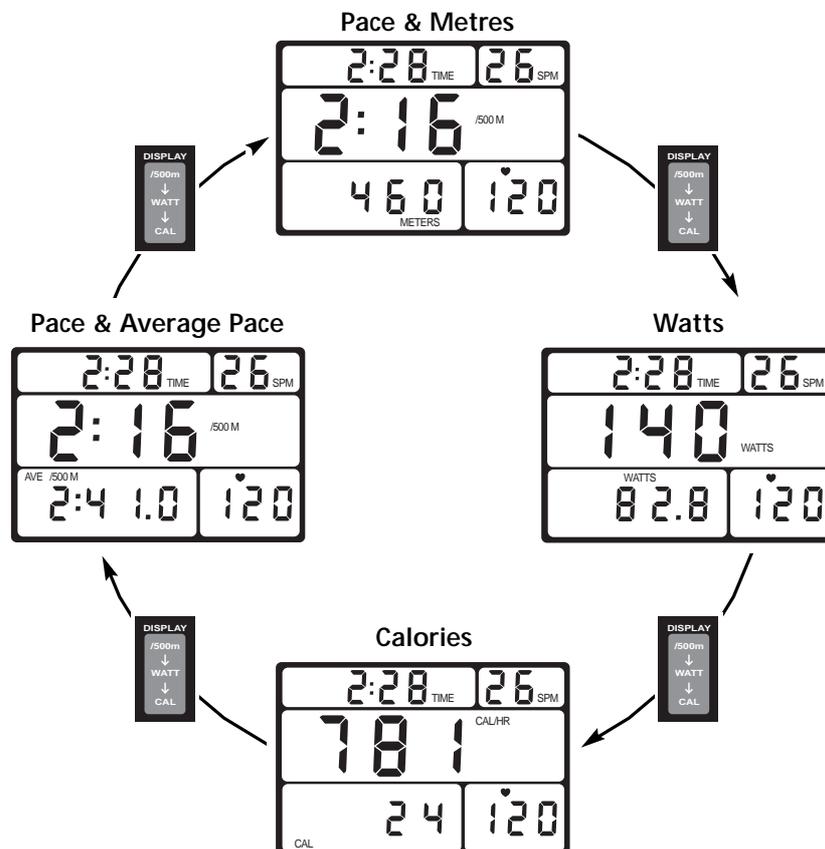
Getting Started

The PM2 starts automatically, displaying information about your performance when you begin rowing. Here is what it shows:

- Elapsed Time. How long you've been rowing.
- Stroke Rate. In strokes per minute (spm), updated every stroke.
- Output for each Stroke. How hard you pulled on the last stroke. This is displayed in a choice of three units; pace/500m, calories/hour and watts.
- Total or Cumulative Output. Your cumulative output since you started rowing. Displayed in a choice of four units; average pace, metres, calories and watts.
- Heart Rate. If a Heart Rate Interface is attached to the Indoor Rower and you are wearing a chestbelt transmitter, this display will show your heart rate in beats per minute.



Display Modes



Preset Workouts

You can set up four different types of workout on the monitor; pre-set time duration, pre-set distance, timed intervals and distance intervals. After you have finished a workout, you can use RECALL to view your performance. The sample workouts in Table 5.1 are designed to help you become familiar with the monitor. We recommend you set them up as you read through each example. You may change the display mode before, during or after your workout.

Table 5.1

<p>Example 1 - Pre-set Time (45 minute row)</p>
<p>Example 2 - Pre-set Distance (5,000 metre row)</p>
<p>Example 3 - Time Intervals (10 x 1 minute hard/1 minute easy)</p>
<p>Example 4 - Distance Intervals (5 x 500 metres with 2 minutes rest)</p>

Notes

- i. During examples 3 and 4 the interval number will be displayed in the upper right corner during the rest interval.
- ii. Your workout results will remain in the monitor's memory until another workout is started, even if it is turned off.

Recall

After you have finished a workout, you can use RECALL to view your performance during each split or interval of your workout.

 The first press of the RECALL button displays the end of workout information. Each successive press of the RECALL button shows the next earlier split or interval until either the last split has been displayed or there is no more memory available (maximum storage is 20 splits or intervals).

The word SPLIT will appear on the screen to indicate that you are viewing split information as opposed to end of workout information. Default splits are two minutes for timed workouts and 500 metres for distance workouts.

 The side arrow button works the same as RECALL. It shows the next earlier split or interval.

 The up arrow button shows the next later split or interval.

 The DISPLAY button can be used during split recall to view splits in different modes; /500m split pace, watts or calories.

 Pressing REST during split recall shows splits in cumulative mode. This is indicated to the user by "CU" in the centre display field. Press REST again to exit CU mode.



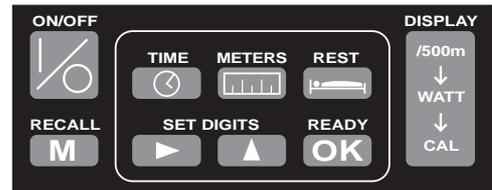
The Heart rate box shows your HR at the end of each interval or split.



The SPM box shows your average strokes per minute for each interval or split.

Extra Functions

All of the monitor buttons except the ON/OFF button have extra functions which are activated when you press and hold down the READY button.



Splits

The monitor can record a maximum of 20 splits for a set time or distance.



Custom Splits (time). READY/TIME: To set custom splits (time) press READY and TIME together, then use the SET DIGITS buttons to set the split time. Press READY when done.



Custom Splits (distance). READY/METRES: To set custom splits (distance) press READY and METERS together, then use the SET DIGITS buttons to set the split distance. Press READY when done.



Splits On/Off. READY/RECALL: To display the split performance press READY and RECALL together. The split score will hold for 5 seconds in the lower left display window, and then return to the normal display. When the monitor starts up the splits option is off by default.

Drag Factor



READY/REST: To display the drag factor press READY and REST together and then row a few strokes. The drag factor is useful if you use Concept II Indoor Rowers in different locations and want to be sure the resistance level is the same. The typical range for the drag factor is 103 (damper setting 1) - 223 (damper setting 10). When the monitor starts up the drag factor option is off by default.

Odometers

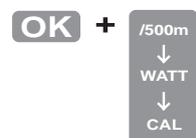


Resettable. READY/SET DIGITS ▲ : Displays cumulative distance rowed and is resettable. At 99,999m it rolls over to 00,000. Press RECALL to reset to 0. Press READY or ON/OFF to get out of this function.



Non resettable. READY/SET DIGITS ► : Displays cumulative distance rowed and is not resettable. Distance is in kilometres and is only displayed when READY and SET DIGITS ► are being pressed together.

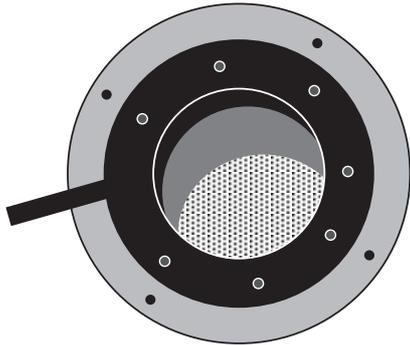
Display Test



READY/DISPLAY: Press READY and DISPLAY together and the monitor will perform a self-test displaying all segments. Press ON/OFF to end the test.

2. The Damper Lever

Whilst you become familiar with the Indoor Rower and the rowing movement, we recommend that you set the damper lever on the side of the flywheel at level 3. When you have developed good technique you can then experiment with the different damper settings to find the most suitable setting for your training needs.



Adjusting the Resistance

Resistance is adjusted by moving the damper lever within the range of levels 1 (low) - 10 (high). This increases or decreases the amount of air flow into the flywheel. The fan blades on the flywheel create wind resistance to slow the flywheel down on the Recovery and offer resistance during the Drive.

A higher damper setting allows more air into the flywheel which slows the wheel more quickly on the Recovery and offers greater resistance on the Drive. A lower damper setting admits less air to the wheel and so slows it down less quickly on the Recovery and offers less resistance on the Drive.

However, the damper setting is NOT an indicator of fitness or workout intensity. It simply changes the speed of the Drive, not unlike changing gear on a bicycle. Workout intensity is determined solely by your own effort. The harder you row, the faster the flywheel spins and the more resistance you will feel. For a given amount of effort a high damper setting will result in a lower stroke rate than for a lower damper setting.

As your fitness level and rowing skill improves you will be able to achieve better scores (i.e. faster pace, higher watt output, or greater rate of calorie consumption), regardless of the damper setting you choose.

3. Pace Guide

This guide will give you your finishing time for a variety of different workouts, provided you maintain an even pace for the duration of the row.

Note: a marathon is 26.2 miles or 42,194 metres.

Pace Guide					
500m	2,000m	5,000m	10,000m	Marathon	100,000m
1:22	5:28	13:40	27:20	1:55.20	4:33:20
1:24	5:36	14:00	28:00	1:58.09	4:40:00
1:26	5:44	14:20	28:40	2:00.58	4:46:40
1:28	5:52	14:40	29:20	2:03.46	4:53:20
1:30	6:00	15:00	30:00	2:06.35	5:00:00
1:32	6:08	15:20	30:40	2:09.24	5:06:40
1:34	6:16	15:40	31:20	2:12.13	5:13:20
1:36	6:24	16:00	32:00	2:15.01	5:20:00
1:38	6:32	16:20	32:40	2:17.50	5:26:40
1:40	6:40	16:40	33:20	2:20.39	5:33:20
1:42	6:48	17:00	34:00	2:23.28	5:40:00
1:44	6:56	17:20	34:40	2:26.17	5:46:40
1:46	7:04	17:40	35:20	2:29.05	5:53:20
1:48	7:12	18:00	36:00	2:31.54	6:00:00
1:50	7:20	18:20	36:40	2:34.43	6:06:40
1:52	7:28	18:40	37:20	2:37.32	6:13:20
1:54	7:36	19:00	38:00	2:40.20	6:20:00
1:56	7:44	19:20	38:40	2:43.09	6:26:40
1:58	7:52	19:40	39:20	2:45.58	6:33:20
2:00	8:00	20:00	40:00	2:48.47	6:40:00
2:02	8:08	20:20	40:40	2:51.36	6:46:40
2:04	8:16	20:40	41:20	2:54.24	6:53:20
2:06	8:24	21:00	42:00	2:57.13	7:00:00
2:08	8:32	21:20	42:40	3:00.02	7:06:40
2:10	8:40	21:40	43:20	3:02.51	7:13:20
2:12	8:48	22:00	44:00	3:05.39	7:20:00
2:14	8:56	22:20	44:40	3:08.28	7:26:40
2:16	9:04	22:40	45:20	3:11.17	7:33:20
2:18	9:12	23:00	46:00	3:14.06	7:40:00
2:20	9:20	23:20	46:40	3:16.55	7:46:40
2:22	9:28	23:40	47:20	3:19.43	7:53:20
2:24	9:36	24:00	48:00	3:22.32	8:00:00
2:26	9:44	24:20	48:40	3:25.21	8:06:40
2:28	9:52	24:40	49:20	3:28.10	8:13:20
2:30	10:00	25:00	50:00	3:30.59	8:20:00
2:32	10:08	25:20	50:40	3:33.47	8:26:40
2:34	10:16	25:40	51:20	3:36.36	8:33:20
2.36	10:24	26:00	52:00	3:39.25	8:40:00
2.38	10:32	26:20	52:40	3:42.14	8:46:40
2.40	10:40	26:40	53:20	3:45.02	8:53:20
2.42	10:48	27:00	54:00	3:47.51	9:00:00
2.44	10:56	27:20	54:40	3:50.40	9:06:40
2.46	11:04	27:40	55:20	3:53.29	9:13:20
2.48	11:12	28:00	56:00	3:56.18	9:20:00
2.50	11:20	28:20	56:40	3:59.06	9:26:40
2.52	11:28	28:40	57:20	4:01.55	9:33:20
2.54	11:36	29:00	58:00	4:04.44	9:40:00
2.56	11:44	29:20	58:40	4:07.33	9:46:40
2.58	11:52	29:40	59:20	4:10.21	9:53:20
3.00	12:00	30:00	60:00	4:13.10	10:00:00

5. Concept II Incentives

Distance Award Scheme

The Distance Award Scheme provides a range of progressive distance incentives appropriate for each age group. When you reach each of your distance goals send us a copy of your training log (see Section 5.4 Training Log) signed by a witness for verification, and we'll send you your well-deserved Distance Award Scheme Certificate and T-shirt.

There is no time limit within which the distances have to be completed, so you may take as much or as little time as you wish.

Classification

Junior - For anyone aged twelve or under, there are four Awards; 10,000m, 25,000m, 50,000m and 100,000m.

Youth - For anyone aged between thirteen and eighteen, there are again four Awards; 100,000m, 250,000m, 500,000m and 1,000,000m.

Senior - For anyone aged eighteen and over, the four Awards are for 1 million, 5 million, 10 million and 15 million metres.

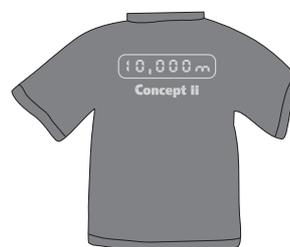


Table 5.2

Distance Award Schemes				
Junior (up to 12)	10,000m	25,000m	50,000m	100,000m
Youth (13 to 18)	100,000m	250,000m	500,000m	1,000,000m
Senior (18+)	1,000,000m	5,000,000m	10,000,000m	15,000,000m

Notes

When you reach each of your distance goals, send in your log (or a copy) signed by a verifier, and you will receive a certificate and T-shirt. The metres from each award count towards the next.

Concept Ranking

The Concept Ranking is published annually and includes personal best performances for rowers throughout the UK and Republic of Ireland. Entries close mid-February each year and the on-line version is usually available in April, with the printed version published each May. Entry is open to anybody in the UK and Republic of Ireland. Table 5.3 details the events and Table 5.4 the age categories available.

Table 5.3

Concept Ranking Events					
Individual	2,000m	5,000m	10,000m	42,194m (marathon)	100,000m
Team	-	-	-	-	100,000m

Table 5.4

Concept Ranking Age Categories for 2,000, 5,000 and 10,000 metres														
Men	J13	J14	J15	J16	J17	J18	19-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99
Lwt Men	-	-	-	-	-	J18	19-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99
Women	J13	J14	J15	J16	J17	J18	19-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99
Lwt Women	-	-	-	-	-	J18	19-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99

Notes

- i. Remember to use the pre-set distance to record your time to the nearest tenth of a second or else it will be defaulted to .9 when published.
- ii. The 100,000m team event caters for male, female and mixed teams of up to 10 individuals. At least one third of a mixed team must be female.

Indoor Races

Indoor races come in all shapes and sizes. National and world championships are staged annually over the 2,000m race distance. However, many other events choose different race formats. For an up-to-date race calendar check out the Concept II website (www.concept2.co.uk/v4/calendar.htm).

Table 5.5

Events Organised by Concept II	
British Indoor Rowing Championship (2,000m)	UK, each November
World Indoor Rowing Championship (2,000m)	Boston USA, each February



Section 6 :

Glossary

Section 6 : Glossary

Aerobic Work	Exercise which uses oxygen. Low to moderate intensity activity that can be sustained for long periods. It is the foundation of most training.
Anaerobic Alactate	The initial stage of energy production.
Anaerobic Threshold	The maximum energy output sustainable via the aerobic system.
Anaerobic Work	Exercise without oxygen. Hard work done over very short periods which cannot be sustained.
Beginning	The point where the load is taken in the rowing cycle.
Blood Washout	Low intensity exercise which raises the metabolism, increasing blood flow through tired or damaged muscles.
Body Adaptation	Regeneration of the body during rest following exercise.
Cardiovascular	Heart and lung functions during exercise.
Drive	Application of power during the rowing cycle.
Finish	The end of the Drive phase and the beginning of the Recovery phase of the stroke.
Lactic Acid	By-product in the energy production cycle.
Maximum Heart Rate (MHR)	Maximum number of beats per minute (bpm) that the heart is capable of beating. MHR declines with age and can be calculated either by exercising at maximum capacity or by applying the MHR formula (220 minus your age) which is accurate within 10-12 beats.
Macro Cycle	Number of weeks in a training cycle.
Micro Cycle	Number of training sessions per week.
Periodisation	Organisation of training objectives into a logical order.
Recovery	The time between the Finish of the Drive and the Beginning of the next Drive.
Resting Heart Rate	Heart rate when the body is totally at rest - measured first thing in the morning.
Shunt Mechanism	The process where lactic acid is processed via the aerobic energy system.
Stroke Rate	See Strokes Per Minute.
Strokes Per Minute (spm)	Also know as Stroke Rate this refers to the number of complete stroke cycles rowed per minute.
Taper	A 7-10 day training period immediately preceding competition.
Training Bands	Define the different levels of training intensity, and describe what is happening to the body at different work loads.

Section 6 : Glossary

Training Cycle	A limited period of training, usually between 4 to 8 weeks, that is directed at a specific objective.
Training Intensity	Consists of duration, stroke rate and the heart rate this elicits.
Training Load	Consists of the quantity and quality of work. The emphasis within a systematic programme will shift from quantity to quality.
Transportation	The process of carrying oxygen to the working muscles.
Utilisation	The efficiency of the muscles to use the available oxygen during exercise.
VO₂ Max	A measure of the body's ability to use oxygen.
Wave Principle of Training	Variation of the training doses from light to hard.