

*SPECIAL TURBO TRAINING METHODS
DEVELOPED IN CONJUNCTION WITH
A HEART RATE MONITOR
SPECIFICALLY FOR THE
SERIOUS RACING CYCLIST*

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This type of specific training benefits immensely from the use of notes and observations, don't hesitate to write anything down that you think is relevant or may come in useful later.

Well here we are again, it's now four years since I wrote the manual "Successful Turbo Training For Bicycle Time Trials" and I know for a fact that hundreds of racing cyclists, both in the United Kingdom and countries abroad have had tremendous success and many personal bests have been beaten simply by following the eight week programme. You are probably one of these cyclists, if not its a fair bet you know someone who is.

As far as training aids go I still think the "Turbo Trainer" or Wind Load Simulator" as it is sometimes called doesn't as yet have an equal, although another device now becoming familiar to us all is pushing it pretty close. Yes, you are right, it's the Heart Rate Monitor, Which as from now on will be referred to as the H.R.M. The H.R.M. is invaluable to any cyclist or athlete who wishes to train to their optimum level. It totally eliminates the hit and miss method of "finger on pulse" counting, it constantly monitors and displays your heart rate regardless of your level of effort, thus enabling you to get on with the job in hand, training hard but in complete control and knowing that your time is being utilized to the full. I honestly don't think that the 'serious' cyclist, and I mean serious in every sense of the word, can afford to train without a H.R.M. Yes I know, many cyclists both past and present have trained

and raced successfully without the use of an H.R.M. but these cyclists have learned to 'read' themselves and that is something the average club level racing man cannot do. So, we allow the H.R.M to "read" for us. It is almost impossible to put a foot wrong once you have familiarized yourself with the way the H.R.M. operates. Once you have learnt the basics then read this manual and understand it, you will save hours of trial and error. I wish I could have bought this wealth of knowledge for a few pounds when I first started cycling, or even when I wanted to increase my speed, but the only advice I ever seemed to hear was "you get the miles in lad, the speed will come naturally" which I found to be not altogether true . . .

History

I will briefly outline my history and qualifications; My history, I didn't even start riding the bike until I was thirty three years old, and by the winter of 1985/6 with almost seven years of competitive cycling behind me I had virtually achieved nothing. With personal bests of 2hrs. 6mins. 14secs. for 50 miles, 1.1.16. for 25 miles and 24.12. for 10 miles. I was what you would call a pretty average club cyclist (if you were being charitable). I would train over vast distances, I rode out to races and rode home from them, but whenever I tried to raise my speed there was nothing there. Because of my late start, plus the fact that I was now almost 41 years old, I felt I had possibly reached the limit of my potential. I was wrong . . .

The rest, as they say, is history. On the following page is a photocopy of the actual result sheet from the first event I rode after discovering the "Turbo". It was The Huddersfield Road Club open "25" on the bitterly cold and rather unfashionable V.336 in North Yorkshire, held on March 29th, 1986. As far as I am concerned this result sheet says all there is to say about the benefits of turbo **training**.

I do agree that 55.15 isn't a particularly sparkling ride, that isn't really the issue, the point being, is that I improved on my previous best time by just over six minutes and until now I had been a 41 year old no hoper!

So my friends, to coin a popular phrase "If I can do it, I am sure you can". You see, we now have the benefit of the new super training aid, The H . R . M .

That is a very brief outline of my cycling history. Nothing to write home about I hear you say, well my qualifications are even less ... I haven't any! Other than my passionate interest in improving race performance of the average club cyclist.

My own racing has had to take a back seat for the last two seasons because of the steady stream of letters which I receive from cyclists regarding training. Can you imagine how difficult it must be to coach someone successfully by post! Someone you have never met or even spoken to? It's this unusual aspect of cycle coaching along with the feedback I have had from literally hundreds of fellow bikies, all striving to improve their performances that has enabled me to gather enough invaluable information to put this manual together.

I would like to take this opportunity to thank you all for furnishing me with details of your improvements, and in very odd cases lack of them. I am now able to include programmes to cover long distance time trials and road racing . . .

HUDDERSFIELD ROAD CLUB/SALAMANDER FABRICATIONS.

OPEN 25 MILE TRIKE TRIAL.

SATURDAY 29th MARCH, 1986, COURSE: V536.

TIME: SFDRb. EYirfc *fcCuiTAiY.

Mrs E. Linley Yorks R.C., A. Goldsbrough. E. Linley
 Yorks R.C. 92, Lewhurst Road, Far town, Huddersfield.
 Telephone : 512119. Q1PIC1AL hESULTt,

1st	46	P. A. Read	Goole Yermuyden	55.15	£8
2nd	47	J. Furniss	Brereton Wh.	57.2b	£6
3rd	40	S.	Holme Valley Wh.	57.49	£4
Wood					
1st Veteran	46	P. A. Read	Goole Verm.	55.15	£3
1st Vet. on std.	46	P.A.Read	Goole Verm.	+11.15	£3
1st Lady	68	Miss D.Heeley	Seacroft Wh.	I. 10.55	£3
1st Junior	108	A. Bowler	hossendale R.C. I. 05.		*3
1st Juvenile	21	P. A.	Hudds. R.C.	I. 11.23	£3
1st Team of 3	59	N. Byson	Halifax Imp Wh.	56.09	£2
	54	N.C.Boylan	" "	59.58	£2
	43	I.R.Talbot	" " M	1.00.54	£2
				2.58.41	

Congratulations to all prizewinners and particularly the
 seventeen raiers who achieved personal bests on a far from ideal
 day.

Basics

I will explain to you through the pages of this manual how to train to your optimum level using an H.R.M. in conjunction with a turbo trainer and some minimal road work. I will keep it as simple and concise as possible and if you follow the basic guide lines you will improve. Obviously if you are already a competition record holder or Star Trophy winner your chances of further improvement are rather limited compared to a club tester for instance whose potential is virtually untapped. So, please read through this manual carefully, don't miss bits out, I agree, you may know some, or even most of it already but that vital sentence can make all the difference between success or failure . . .

Impossible?

When I wrote the first manual (Successful Turbo Training Etc.) I felt it would benefit short distance time trialists but with the advent of the H.R.M. plus an altered turbo programme I have since found that all distances can be attempted. In fact my son Julian won the Teeside Cycling Association 12 hour at his first attempt at the distance on a diet of Turbo training with maximum session length being 65 minutes, and around three hours

road work a week plus one six hour ride 10 days before the event, along with his usual races. "Impossible", say the cynical ones amongst you, well I expected that, because I agree it is rather hard to believe, but I know for a fact a large percentage of cyclists start a 12 hour event grossly over trained and already tired. Again I admit the distance is very ordinary (254 Miles), but anyone who rode that race will tell you that the conditions were intolerable with brilliant hot sunshine, temperatures in the mid 80's and a strong energy sapping westerly wind . . . but . . . the amazing thing being was that he rode the event at a pre-determined heart rate of 140 beats per minute + /- of 2-3 beats.

Dedication

The H.R.M. is not going to make your training any easier, if you genuinely want to be a successful racing cyclist you will have to dedicate yourself to a specific training programme. It is impossible to reach the top if you adopt a half hearted attitude towards your training schedule.

I have detailed a selection of programmes to suit various aspects of cycle racing, all you have to do is select the ones relevant to your requirements and then adhere to them. Do not swap from one to the other, be totally single minded with regard to your training and success

will come to you.

Very few cyclists have natural talent, you will hear it said on many occasions, "Its easy for him he's a natural". Even in the major cycling tabloids one will often see "It was easy for Adkins or Dighton" or whoever happens to be flavour of the month at that particular moment, well, I have news for the author of those comments, it isn't any easier for these super stars than it is for those riders that have yet to beat the hour. The top riders do not abound with natural talent; they have usually made sacrifices that the average club level tester would not dream of making. Physical size and make up may come into it to a lesser degree if at all, just compare the almost giant stature of Gary Dighton to that of the relatively diminutive Gethin Butler, they are both capable of turning out virtually the same performance, why? Simply because they are DEDICATED to their chosen sport. As with any successful person in any business, profession or sport, sheer perseverance and determination have brought the reward of success over all opposition . . .

The Facts

You may find turbo training boring. Well, to a certain degree it may be but you must train yourself to overcome the boredom just as you are going to train yourself to ride the bike fast. Learn to concentrate on the job in hand. Turbo training only takes up a fraction of the time compared to training on the road, you shouldn't really have the time to become bored. Please don't misunderstand me, if you enjoy your road rides then please carry on but at a steadier pace. Training on

the turbo is extremely depleting, I cannot emphasize this point enough. It's virtually impossible to train on the turbo three times a week and on the road as well at the same level, you would be totally shattered within a month. More is not better, do not let your enthusiasm get the upper hand, be warned!!!!

I reckon the ratio of turbo to road training is about three to one, e.g. 20 minutes turbo training = 1 hour road work. I am fully aware that a hard session on the turbo is no substitute for a steady ride on a pleasant summers day, but to be fair that isn't what this manual is about .

The Benefits

Why train on the turbo at all? Well for one thing it is far safer than training on the road; you would be a danger to yourself and to other road users if you attempted to train at this level amongst traffic. On the turbo you avoid all the usual hazards of road training such as foul weather, diabolical road surfaces and irate drivers, while at the same time you will find it far easier to accurately monitor your performance when using an H.R.M. The turbo is also the ideal place to perfect your position and style, you can try different saddle heights, stem lengths, tri.-bars and get your pedalling technique off to a fine art and never have to leave the garage. Okay, I know it wont do much for your bike handling skills and bunch riding, you are going to have to learn these on the Sunday run's

or on the chain gang if you so wish.

You see, training on the turbo isn't just about thrashing yourself senseless, or "killing" ten minutes on a wet Sunday when the club run is rained off, it's the perfect environment in which to prepare yourself in methodical and scientific manner in readiness for the new season . .

General Health

This is a real health warning, turbo training in conjunction with a heart rate monitor will probably be the hardest physical thing you have ever done. It will, on occasions involve working your heart to its maximum rate. This in itself can be extremely dangerous if your general state of health is not 100%+. Do not even attempt the easiest of these programmes if you are in the slightest doubt about the state of your health. Do not fool yourself either, if you are at all unsure then arrange to have a full medical examination. With a clear bill of health you will have peace of mind to train to your absolute limit knowing full well that every session is going to be productive and one step further to success.

Nutrition

I cannot even begin to touch on this complex subject, if you are already a dedicated and serious racing cyclist you will no doubt have devised what you consider to be the almost perfect diet for yourself. Diet and nutrition are very important factors, far too important to be overlooked or treated lightly, you would be amazed at what

affect diet has on your performance. I have studied the subject for some time and found it most intriguing, you will definitely find that a concerted effort to improve your nutritional intake will result in more than a subtle upward trend in your performances. So, if you are genuinely interested in improving your diet, then either approach a sports nutritionist or go to a really good book shop and buy one of the many volumes which are available on the subject. Do not treat your diet lightly, it's an extremely important part of your preparation in your quest for improved fitness, performance, and ultimately the road to the top . . .

I am sure I don't even need to mention tobacco and alcohol, Yes even out of season!!!!

. The Equipment

This manual is about using Turbo Trainers and Heart Rate Monitors so in fairness I feel I am expected to touch on the subject of which ones to use, if only lightly. I'm not trying to avoid the issue of which is the best etc. but at the same time I do not want to appear biased, so what I will say is buy the best that you can afford. There is very little to choose between the mid priced turbo trainers. None of them are built to take the hammer that you and I are going to subject them to, they will eventually develop metal fatigue, rust eats into the

welded joints and they become unsafe to use at the level we train. Having said all that I think that at the price they are excellent value and all it means is that it's most likely that you will have to replace it every couple of seasons or so. I have got through five in the last six years, I have painted them with rust preventer and strengthened them with steel plates but I'm afraid they still eventually erode into the inevitable pile of iron oxide.

With regard to Heart Rate Monitors, again buy the best you can afford, by best I don't mean the most expensive one available, I mean the one that represents best value for what you want from it. There is no point in paying for all the "add ons" if you are not going to need them. I have found that some of the cheaper models available tend to fluctuate wildly just when you least want them to, this isn't just my opinion, I have found it to be a widely accepted fact. So, start as you mean to go on, buy some decent equipment that hopefully won't let you down, there is nothing more infuriating than a fan flying off the turbo just when you are halfway through an intensive training session or the display of the H.R.M. flashing somewhere between 0 and 200 B.P.M. when you are trying to ride at a steady 150.

Again, please take heed, I have worked with both these devices for the past six years and I feel am qualified enough (if only through trial and error) to say, buy these items wisely, you may be able to mend a puncture, but a

faulty display on an H.R.M. is another matter completely . . .

Entertainment

There are many varied trains of thought regarding entertainment while turbo training. What with radio, T.V., personal stereo players and even reading magazines plus a fan to keep you cool. Yes, I have heard them all, but I advocate none of them. I maintain that you cannot train seriously while being entertained, if you think you can then I say you are wrong. Any form of distraction is fatal to the success of a serious training programme, don't even try it. I have heard it said so many times, "I am bored sick on the turbo so I watch television etc. ". Well, the next time you hear someone say that just ask them what their PBs. are!

So, on to the cooling fan, if you feel more comfortable when using one then by all means do so, but remember there are no cooling fans around during a hot July time trial and these turbo sessions are ideal for conditioning yourself in preparation for such events . . .

Maximum Heart Rate (The theory)

Right, at last we are getting down to business, this is the bit where you should be sitting up and taking notice! . . .

A lot has already been said on the subject of "maximum heart rate", much of it by people who have never actually had anything to do with either knowing or needing to know exactly what heart rate training is all about. I shall only pass on to you what I have found to work for me and for cyclists who have worked with me. All the information and knowledge in this manual has been personally tried and tested, and I can tell you with the utmost confidence that it works for cyclists at all levels and at all distances.

Before you start training on heart rate it is vital that you arrive at your maximum heart rate (Max.H.R.). This will give you a base figure to work from when ever you are training with an H.R.M. there is no point in starting to train on heart rate until you have discovered your true Max.H.R. and before you test yourself you should ideally be conversant with my first manual "Successful Turbo Training For Bicycle Time Trials".

I am sure most of you are familiar with the 'rule of thumb' equation ... Maximum heart rate = 220 minus age. Well as I said this is a general rule of thumb and as far as I am concerned it is far too inaccurate for what we are going to do. In fact it's virtually useless, so don't use it. I can't actually think of anyone that this equation

applies to. My own max heart rate for instance would be ... 220 minus my age (47) = 173 B.P.M. when my true Max.H.R. is actually 183. Consequently, if I had trained thinking that my max. heart rate was 173 B.P.M. I would have been training well below my potential limit. Another cyclist I tested who is 30 years old with a theoretical Max.H.R of 190 B.P.M. turned out to have a true M.H.R. of 214 B.P.M.! So as I said earlier it is extremely important to find your true max. and forget the theoretical equation.

Unfortunately finding out is another matter, it will most likely be the hardest physical thing you will ever have to do, but thankfully you wont have to do it very often. Once you have acquired the magic figure you will train and race at fixed percentages of it, thus eliminating all previous guess work.

Maximum Heart Rate (eventually)

At this point I am going to repeat myself at risk of becoming boring.

DO NOT ATTEMPT TO ATTAIN Max.H.R. UNLESS (A) YOU HAVE HAD A RECENT MEDICAL WHICH INCLUDED AN E.C.G. TEST. (B) YOU KNOW FOR AN ABSOLUTE FACT THAT YOU ARE 100% FIT AND ARE PREPARED TO TAKE THE RISK.

You may at some time have been told that it is unnecessary to need to know your maximum heart rate to enable you to both train and race at your full potential, well that is someone else's theory, what you are reading at this moment in time is my opinion on the subject. I have generally found other peoples opinions far too wrong far too often, that's why I have needed to arrive at my own conclusions.

Why Heart Rate Training?

The less fit the heart is, the easier and quicker it will reach it's maximum rate, the reason being is that an untrained heart works rather inefficiently, actually pumping less blood per beat than the trained heart, therefore it has to beat relatively faster to accomplish the same given work load. The untrained heart will also take far longer to recover given the same work interval and it is this recovery that through the pages of this manual we are going to improve. This on going recovery is so very vital to every cyclist striving to, perform at their optimum fast cruising speed.

IT must be said that the H.R.M. in conjunction with a turbo trainer is a potent partnership for accurately monitoring your performance and improvement. It is fail safe, you can neither over nor under train as long as you

adhere to the guide lines of this manual . . .

Minimum Heart Rate

At the other end end of the scale it is as e qually important that you become familiar with your minimum or resting heart rate, (Min.H.R.). This varies tremendously according to age and state of fitness along with many other subtle governing factors. Strangely, unlike max. heart rate no one has dreamed up a 'rule of thumb' equation with which to work it out.

It is generally thought that the resting heart rate is to be found directly after waking but before rising, yet again I have found this not to be entirely true. For instance, my heart rate on waking is normally 54 b.p.m. which is high compared to my heart rate after using the bathroom and taking the dogs for a brisk walk. If I then sit down and relax for ten minutes my heart rate will fall to some where around 42 b.p.m. Therefore this is the time of day I check my Min.H.R. With a little trial and error you will soon find the best time to check yours. A light meal will increase your heart rate by approx. 5-7 beats, a main meal which includes some first class protein can increase it by as much as 15 beats, so always check it on an empty stomach, this check will form the basis of whether you should train or not on any given day. If your heart rate is more than 10% over its normal resting minimum then

either do not train at all or just train very lightly. The fact that it is high means that you haven't recovered from your previous session, or you are going to be ill. You may feel well in yourself but an intensive training session on a high resting heart would be counter productive, you would have a bad session and not knowing the reason why you would train harder the next time. This would be the first step to over training and eventual staleness. This is where the H.R.M. begins to come into its own, used correctly you will never over train again and will be able to perform at a constant high level throughout the season.

Final Briefing

Using the heart monitor will revolutionize your training, you will have to forget virtually all that has gone before, every training session will be far more intense and condensed than anything previously undertaken. You know by now that when I mention training I mean specific training to a given schedule and NOT "just going out for a ride".

Once you have become totally familiar with the H.R.M. you will find it almost second nature to train and race on heart rate alone. Until recently heart rate has been an unknown quantity particularly when under effort, but now thanks to the advent of the H.R.M. progress can

be efficiently monitored at all levels of training, therefore none of your training time will be wasted, every minute is productive and your actual training time will be reduced dramatically.

Maximum Heart Rate (The Reality)

In my opinion the turbo is the only place to test for maximum heart rate. Ideally you should have someone with you who has been fully briefed and knows exactly what you are doing. You should be fit and fully rested having done nothing really strenuous for approximately 36 hours and eaten nothing at all for at least four hours prior to the test.

True Max.H.R. cannot be reached quickly, the entire test will take at least 30 minutes. You must pick a day when you feel well and are keen and eager to work to your maximum, you must be in the right frame of mind to be able to endure a high level of stress for this length of time.

DO NOT ATTEMPT TO ATTAIN MAX. HEART RATE WITH A HALF HEARTED ATTITUDE.

Okay, you are ready to start. You are both mentally and physically prepared and you have someone with you who will make a note of your heart rate every minute and

instruct you when to change gear, as well as encourage you when things get a bit rough!

Ideally you should use a close ratio block so that the effort is both constant and progressive, 12-18 would be fine but it is not critical, in fact virtually any block will do as long as long as the increment between sprockets is only one tooth. The idea of the exercise is to increase your work load at a given time while maintaining a constant rate of pedal revolutions. Remember, COMPLETE REVOLUTIONS. You can either count the revs, yourself, use a computer with rev. counter (cadence) or ask your helper to count for you. I have always preferred to count myself. If your H.R.M. isn't waterproof then wrap it in a poly, bag or cling film. Wear the minimum of clothing to start with as you don't want to have to stop to remove any.

Overleaf you will find my method of finding your maximum heart rate. I have found it to be the most accurate method available to the average club cyclist.

Maximum Heart Rate (The exercise)

Warm up thoroughly by pedalling briskly in a small gear of approx. 42*15 until you are perspiring enough to enable your H.R.M. to settle down and show a constant read out of + /- 2 or 3 beats (not fluctuating wildly). This warm up should take the very minimum of 15 minutes, DO NOT RUSH IT.

Change up onto the big ring, approx. 52 or 53 teeth and select your bottom gear on the block,

17 or 18 teeth . . .

Pedal at 95 r.p.m. for two minutes.

(Note heart at the end of every minute.) . . .

Change up one sprocket every two minutes with no rest in between . . .

Maintain 95 r.p.m. at all times . . .

Your helper may have to encourage you as the effort becomes greater . . .

Your heart rate will rise fairly constantly until at one point it will level out regardless of the effort you put in, this is called the "pulse deflection rate", it is NOT your maximum heart rate. Make a note of your pulse deflection rate as this is extremely important.

Carry on through the remaining gears until you reach Max. The last two gears will seem like an eternity, but it is somewhere around this point that M.H.R. will be reached. Maintain your revs, until you reach absolute breaking point. If for some reason you still feel you haven't reached your Max. then increase your revs, to 100 r.p.m. for another two minutes or until you reach the target. At this point you should be absolutely legless, if you are not then you simply haven't tried hard enough. AT THIS POINT DO NOT STOP PEDALLING, change into a small gear (42 x 16) and continue to pedal at 60 R.P.M. for ten minutes or until your heart rate has dropped below 100 B.P.M. I cannot over emphasize how

vitaly important this is.

Maximum heart rate is the figure that you will base your training on until you test yourself again which will be every three months or so. Don't make a habit of it! Seriously, if you feel you didn't reach your Max. the first time then have another go but not until until you have COMPLETELY recovered, in fact I would suggest at least a week the effort will have taken more out of you than you may think . . .

Heart Rate Table

Once you have the 'magic' figure and you are sure it is as accurate as possible then write yourself a simple table, something along the lines of the one below don't bother with half beats and write in your pulse deflection rate.

<i>MAX.</i>	<i>HEART RATE 3rd JAN. 92</i>	
	<i>Write any relevant details here</i>	
	<i>%</i>	<i>bpm</i>
<i>Max =</i>	<i>100 =</i>	<i>190</i>
	<i>95 pulse def.</i>	<i>180</i>
	<i>90 =</i>	<i>171</i>
	<i>85 =</i>	<i>161</i>
	<i>80 =</i>	<i>152</i>
	<i>75 =</i>	<i>142</i>
	<i>70 =</i>	<i>133</i>
	<i>65 =</i>	<i>123</i>
	<i>60 =</i>	<i>114</i>
	<i>55 =</i>	<i>104</i>
	<i>50 =</i>	<i>95</i>

PIN THIS UP IN FRONT OF YOUR TURBO AND REFER TO IT CONSTANTLY.

Starting To Train

You will find a full range of specific turbo sessions written in detail on the next few pages, they are not in any particular order but they are numbered for your reference. A combination of three or four will suit your particular needs, I have listed toward the end of the manual the ones I recommend for each different aspect of cycle racing. Once you have decided on the programmes you are going to use then stick to them, do not swap and change, be single minded, use each set of chosen programmes for a minimum of six weeks before moving on. If you are going to start the season with short distance time trials and work through all the distances including the odd road race now and then just make sure you change your programme well in advance. You will have to integrate the programmes as you progress through the season, eliminating the old sessions as you introduce new ones. This may sound far too involved but it will become self explanatory as you become more familiar with the system. Remember this may be an entirely new way of training to you, it is like learning a new trade or skill, it will eventually pay dividends as long as you are prepared to give it 100% . . .

Warming Up and Down

PLEASE DO NOT SKIP THIS CHAPTER.

Each session will be preceded by a thorough warm up and finished with a warm down, I cannot emphasize enough how vitally important both of these procedures are, don't ever be tempted to miss either of them out, it would be both dangerous and counter productive to do so. The warm up does just what it says, it warms your entire body, raising the heart rate which in turn supplies your muscles with copious amounts of oxygen rich blood in readiness to cope with the unfair 'hammering' you are going to subject it to!

The warm up will always go like this: Engage a small gear of approx. 42*16 and gradually increase the pedal revs, until you pedalling at around 110 r.p.m. then hold it there for at least 10 mins. until you feel thoroughly warmed and you heart rate has reached 75% of max. If it hasn't reached 75% in this time then your gear is too small so change up until you can maintain 110 r.p.m. with your heart at 75% of max. On the other hand if your heart rate has gone way over 75% then change down accordingly. With the minimum of trial and you will soon find the perfect gear. Once you have warmed up then ease back to 60 r.p.m. until your heart rate drops back to below 70% before starting the programme proper.

The warm down will always be along these lines: When you finish your session DO NOT STOP. Change into a low gear of around 42*17 or so and pedal it at 60 r.p.m. until your heart rate has dropped to 55% of your Max. before climbing off. This will assist in clearing the lactic acid and toxins out of your muscles in readiness for the next time you train, thus eliminating stiffness and sore muscles usually associated with hard exercise. Don't ever be tempted to miss either warm up or warm down out, I know it is looked upon by many as a waste of time but I can assure you it certainly is not, in fact it is as equally important as any other aspect of training if not more so. You cannot train to your optimum level if you don't warm up and down, it's as simple as that, don't think you can, be warned . .

Programme (1)

This is what I call the the 'classic 40 minute session' it is invaluable for thorough conditioning and Lactate Tolerance Training. The greater the effort at which you race and train the more Lactic acid forms in your blood, this in turn inhibits training at a higher rate still until you physically can go no faster. The 40 minute session' educates your system to process Lactic acid at a greater than normal rate thus enabling you to maintain a far higher fast cruising speed.

Warm up as previously instructed.

*Engage a gear of 52*17 (approx) and pedal it at 95-100 r.p.m. until your heart rate reaches 80% of Max.*

Hold it there for 40 minutes, do NOT go over 80% no matter how well you feel.

Keep the effort constant, adjust the gearing if need be to ensure 95-100 r.p.m. with an 80% heart rate.

Warm down as previously instructed.

END OF SESSION

Programme (2)

Warm up as previously instructed to around 75%+ of Max.

Ease back to 70%.

*Engage a gear that you feel is **slightly** too big but one you can still pedal at 100 r.p.m. Try 52*15 to start with.*

Pedal this gear at 100 r.p.m. until your heart rate reaches 85% of Max.

*Change down to 42*17 and pedal at 60 r.p.m. until your heart rate drops to 70%.*

Repeat 10 times.

Warm down as previously instructed.

END OF SESSION.

IT WILL TAKE A CERTAIN AMOUNT OF TRIAL AND ERROR TO FIND THE GEAR THAT SUITS YOU.

Programme (3)

Warm up as previously instructed.

Ease back to 70%.

*Select a gear that feels too big (52*15 or 14).*

Pedal it hard for 15seconds. (Kick into it and try to do around 30 - 35 revs, in the specified time).

Change into a small gear and pedal at 60 r.p.m. until your heart rate drops to 70%.

Repeat seven times only. Increase gearing if you need to. You should always feel over geared during this session.

Warm down as instructed.

END OF SESSION.

This is an anaerobic exercise, (without oxygen) you will notice your heart rate rises after you have actually finished the 15 sec. interval. Seven intervals doesn't seem much but if you have done them correctly you should be legless by now.

Programme (4)

Warm up as previously instructed.

Ease back to 70%.

Engage the big ring and the lowest of your top five gears.

Pedal at 95 -100 r.p.m. until heart rate reaches 75%.

*Ease back on 42*16 at 60 r.p.m. to 70%.*

Change up one gear and pedal at 100 r.p.m. until heart rate reaches 80%.

Ease back as before.

Change up one gear and pedal at 100 r.p.m. until heart rate reaches 85%.

Ease back as before.

Change up one gear and pedal at 100 r.p.m. until heart rate reaches 90%.

Ease back as before.

Change into top gear and pedal at 100 r.p.m. until your heart rate reaches 95%.

Warm down as previously instructed.

END OF SESSION.

Ensure that you ease back between intervals as instructed. There must be a definite interval of work followed by an interval of rest, hence the name 'Intervals'. Don't let them blend into one effort. It may take some time before you can follow these sessions to the letter, don't give up on them the benefits will be well worth all the trouble I promise you.

Programme (5)

*Warm up as previously instructed. Ease back at 60 r.p.m. on 42*16 to 70%. Engage the big ring.*

Select the lowest of your top five gears and pedal hard (not flat out) until your heart rate reaches 85% then out of the saddle and flat out for 15 seconds.

*Ease back in 42*16 at 60 r.p.m. to 70%.*

Back into the big ring and up one gear.

Repeat previous interval through the remaining four gears.

Warm down as previously instructed.

END OF SESSION.

Ensure that the bike is well clamped to the turbo before attempting this session.

Programme (6)

This is a road session. I have found this particular short session to be invaluable training for both starting fast in short distance time trials and finishing sprints in road races.

Find a piece of flat, straight, quiet road and measure out an exact half mile.

Always use this same piece of road and familiarize yourself with it. It must be quiet, you don't need the danger and hassle of traffic as this session is VERY intensive.

Warm up thoroughly by riding for 7-10 miles briskly in a small gear until your heart rate has settled at around 85% of max. Finish your warm up at the beginning of your measured half mile.

Recover to 70% by riding the last half mile or so steadily.

Engage the big ring and the lowest of your top five gears.

Ride over the half mile hard but not flat out.

Ride back to the start slowly. Don't stop.

Change up one gear and when you have recovered to 70% ride over the half mile again.

Repeat until you have used the top five gears.

Increase your effort each time you change up until you ride the last one absolutely flat out.

Record the time it takes for each interval.

You should be aiming for around 55-60 seconds eventually, (on a still day).*

Ride home steadily to warm down

END OF SESSION.

(1) YOU SHOULD FEEL SLIGHTLY OVER GEARED DURING THE LAST TWO INTERVALS.

*(2) *ALWAYS RIDE WITH A BACK OR SIDE WIND. THIS IS A PURE SPEED SESSION AND A HEAD WIND WOULD DEADEN THE EFFECT.*

(3) ALWAYS RECOVER TO 70% BETWEEN INTERVALS.

(4) DO NOT ATTEMPT MORE THAN FIVE INTERVALS, IF YOU CAN THEN YOU HAVEN'T WORKED HARD ENOUGH.

(5) ALWAYS A GENTLY ROLLING START.

Programme (7)

The recovery session.

A session to recover? Yes, contrary to popular belief your body will recover better with a light work load than when doing nothing at all. So, the day after a hard race or training session spend between 20 - 40 minutes on the turbo turning a SMALL gear at no more than 75% of max. This is no more than an extended warm up really. Ease back for the last few minutes to warm down to 60% before climbing off.

Do not exceed 75% regardless of how well you feel.

I would suggest you do this session every alternate day between high intensity sessions, it is invaluable, don't let it develop into a 'bash', save the effort for training , you should look forward to these recovery sessions if you are training hard enough!

Programme (8)

Warm up as previously instructed. Ease back to 70%.

*Engage a gear that enables you to pedal at 95-100 r.p.m. with your heart rate at 80%. Try (52 * 17).*

Pedal it for 25 minutes at a constant rate.

Change up to a gear that will enable you to maintain the same r.p.m but with your heart rate raised to 85% and pedal it at a constant rate for 20 minutes. (Try just one gear higher to start).

Finally change into a gear that will give you a heart rate of 90% while maintaining the same r.p.m. and pedal it for 15 minutes.

Warm down as previously instructed. END

OF SESSION.

Do not try to use this as an interval session, all work is constant and there are no breaks between gears . . .

Programme (9)

Power training.

Warm up THOROUGHLY.

Ease back to 70%.

*Select a gear that is too big, one that you would normally struggle with, 52*12 or a resistance of possibly 3 or 4 on a 'Tacx Variomatic' or 'Cat Eye Cyclosimulator', anyway it has to be a gear that you can only manage to pedal at around 70 r.p.m.*

Pedal it for one minute sitting down.

*Change into 42*16 and pedal at 60 r.p.m. until your heart rate has dropped to 70%.*

Change back into the big gear and pedal for two minutes, maintain 60-70 r.p.m.

Repeat for 3 and 4 minute intervals.

*Change into 42*16 and pedal for 5 minutes @ 110 r.p.m. to restore suppleness.*

Warm down as previously instructed.

END OF SESSION.

Programme (10)

Broken intervals.

This is a fun session but don't treat it too lightly 'cos it isn't very funny. It's what runners call 'Fartlek' training, which is Swedish for speed play. We will call this session unstructured Fartlek, meaning, 'make it up as you go along. I will outline a typical session for you and you can add to it or whatever. Use it when the other 'ordered' programmes become too much for you and you want a change or, fit a session into your weekly regime on a regular basis.

Warm up as previously instructed.

Select any gear that comes to hand and pedal it hard until you run out of steam.

Change into a smaller gear and rev it fast for a while until you have had enough.

Change into top gear and out of the saddle for a while.

Vary the gears and the times you are in those gears, nothing is pre-determined have an easy time or make it very hard, really break it up, have the odd flat out sprint, let the session last

ten minutes or an hour depending on how you feel. Try to keep your heart rate within 90% of max. but basically just enjoy the session!

Warm down as previously instructed.

END OF SESSION.

This session would suit a road man or a tester who has got into the habit of rolling a big gear and lost his suppleness.

Programme (11)

This programme is invaluable to the short distance time triallist.

WARM UP PARTICULARLY WELL. Recover to 70%.

*Select a gear that is slightly too big, try 52 * 14 and do 3 * 1 minute intervals at 100 r.p.m. + with heart rate ultimately to 95% of max.*

Recover between each minute to 70%.

*Change up one gear and do 5 * 30 seconds, try to do 55-60 revs in the 30 sees. (Heart rate to only 90% maybe, this is because the interval isn't long enough to take a fit heart to 95%).*

Recover to 70% between each half minute interval.

*Change up one gear and do 7 * 15 seconds flat out. Try to do 35 + revs in the 15 sees. Kick into this interval hard, you haven't time to wind it up. Your heart rate will continue to rise after you have actually finished each interval.*

Recover to 70% between each 15 second interval.

Warm down as previously instructed.

END OF SESSION.

Programme (11) is particularly intensive, although there is only 7 minutes actual work time under effort. Ensure you have recovered fully before training again. Do not over train, it is easily done, but at the same time don't confuse overtraining with the fact that you haven't actually done enough. The symptoms are similar. Basically if you haven't done enough training you will be racing either at the same level or lower than you have in previous seasons. If you have over trained you will have most likely improved on your previous best times but then lost it again. If you are overtrained your resting heart rate will be consistantly high, in which case your racing speed will slowly deteriorate, you will become mentally disillusioned as well as physically tired. In this case you must ease back, stop racing and training hard and allow your resting heart rate to normalize before continuing with your season. Always conduct a thorough check of yourself before deciding whether you have over or under trained . . .

Programme (12)

The Back to Back Session

This is the name I use for training or racing twice in fairly quick succession. I use it for training when I am rained off and I should be going out for a long road ride or if I want to find a bit of 'zip' quickly. It brings results rapidly if you already have a high level of base fitness. If you are unfit you will most likely find Back to Back too demanding and it could take a week or more to recover, that is if you can manage to do the session in the first place. Remember, this is advanced Turbo Training IT IS NOT a challenge.

Okay, just select two programmes that you can both physically and mentally handle, preferably ones that you are reasonably familiar with. I would use the 40 minute session first followed by a good interval session. The first session should be done early in the day with a break of 3-4 hours followed by your second choice.

If you must eat between sessions then make sure it is something very light but preferably just don't eat. Top up on water by all means, you don't need to carbo load or to replace your electrolyte the two sessions combined won't

take much over an hour.

Work to the same heart rates that you would work to during normal training sessions. Don't let a Back to Back session dictate your day, if the sun comes out between sessions and you fancy a couple of hours on the road then go or on the other hand, if your Sunday ride is terminated by bad weather after an hour or so then do a turbo session to finish off. The Back to Back is flexible, use it to your advantage this is where the turbo comes into it's own.

You may not want to train the day after a Back to Back, if you do then ensure you are fully recovered otherwise there could be a real danger of over training.

Programme (13)

This is a hill climb practice session, it involves riding out of the saddle for fairly long periods. Ensure your bike is safely clamped on to the turbo trainer. It's quite safe to ride like this, try it for a while first until you get the hang of it. No, you won't break your frame, I haven't broken one, ever.

If you haven't a turbo with a friction or gradient facility you will possibly have to create some extra drag. You can do this in a number of ways. I would either increase the resistance between the tyre and the roller or fit an old dynamo to the wheel or you will maybe devise your own method, anyway, whatever you do make it simple .

Warm up as previously instructed.

Ease back to 70%.

Engage the biggest gear you have plus some resistance. (If you have a turbo with resistance built in such as the Tacx Variomatic or the Cateye Cyclosimulator then use No. 4 or 5 and see how it feels to start with. If not use your home made resistance it works just as well. I used a dynamo and increased tyre drag both together for this purpose and it works fine I can

assure you).

Ride out of the saddle in this over big gear for one minute.

Your pedal revs, should ideally be around 70 r.p.m. with a heart rate of around 90-95% toward the end of the session.

Ease back to 70% by changing into your lowest gear and dropping your revs, as low as 30 or 40 r.p.m. if you need to.

Engage the big gear again and this time spend two minutes out of the saddle.

Repeat for three and four minutes easing back to 70% between each interval.

Warm down as previously instructed.

END OF SESSION.

You must be grossly over geared for this session, there is no point in doing it at all if you are under geared. It is specifically a hill climb session and it works well if done correctly. Practice at it, try various gears and ways of creating drag, if you are a poor hill climber then this is the programme for you, it's worth a bit of trial and error to get it right . . .

Compilation programme (14)

This is a programme I have devised specially for those of you who don't have the time to spend on training but still wish to race at a very competitive level.

Total time is around eight hours a week, (100 road miles and approx 3 hours on the turbo). If you can't manage that then you are in the wrong sport. This programme has been used successfully to race at all distances including road races, (with a slight alteration).

The entire programme is spread over fourteen days, the road sessions are repeated twice. I have listed it as Sunday to Saturday but you will have to alter it to suit yourself.

SUNDAY. 60 miles including some hills at 18-20 m.p.h.

MONDAY. Programme No. (7) The recovery session for 40 minutes.

TUESDAY. As Sunday but only 40 miles.

WEDNESDAY. Programme No. (3).

THURSDAY. Programme No. (7). again for 20 minutes.

FRIDAY. Programme No. (8).

SATURDAY. Programme No. (7). again for 30 minutes.

SUNDAY. 60 miles as previous Sunday.

MONDAY. Day off or recovery ride if you need it.

TUESDAY. As previous Tuesday.

WEDNESDAY. Programme No. (9). THURSDAY.

Programme No. (7). for 40 minutes. FRIDAY.

Programme No. (2). SATURDAY. Programme No. (7). 20 minutes.

Well that's it, not too bad is it? Start this programme early February and keep it going all season if it suits you, try a few minor changes to relieve any boredom. If you want to race then don't train on that particular day, it's as simple as that. Oh yes, if you are a road man just incorporate a session of Programme No. (6) once every ten days, do it as well as, not instead of one of the other programmes.

Right, you have fourteen excellent programmes listed here, they have all been tried and tested and they all bring the desired results. You will eventually find through trial and error the ones

that suit you but to save you wasting too much time trying them all out I have listed overleaf the ones that I think work the best for different distances. Whatever you decide to do I suggest you always use No. (1) The 40 minute session' once a week and you always do No. (7) The recovery session' the day after intensive training or racing.

Short distance time trials (To include 25 miles)

Use mainly programmes, 1, 2, 3, 4, & 6 plus one 40 and one 60 mile road session at 75-80% of max. Don't forget to include the No.7 recovery sessions as previously instructed.

This should be a 14 day cycle if you use all I have suggested, give it a try but always remember, it is advanced turbo training it doesn't pretend to be anything else.

Short to medium distance time trials (To include 50 miles)

Use mainly programmes 1, 4, 8, & 11 plus the same road miles as for the previous programme although if you want to extend your road miles don't allow your heart rate to go much above 75% of max. Recovery sessions are vital, do not miss them out.

Long distance time trials (100 & 12 Hr.)

The No. 14 programme was the one my son used when he won the Teeside 12 hr. That was all he did plus one six hour ride ten days before the event along with his normal racing programme. He started the compilation programme on the 14th. of February exactly as laid down in this manual and used it all the season, his performances were consistent throughout, in fact he rode his 'personal' 10 mile T.T. with 20 mins. 58

sees, on the Thursday after the 12hr.

So if you want to try your hand at the longer distances you could do far worse than programme No.14 with possibly a few minor alterations to suit your own lifestyle e.g. if you work shifts you may have to juggle the sessions around a bit, well that's o.k. if you do but try to do a session every day if possible, it's the regularity of training that creates the consistent performances. You may also like to increase your mileage, if so please remember what I said earlier; many cyclists start distance events already tired, keep an eye on your recovery, it must be complete before training again. Don't fall into the downward spiral of over training. Please pay particular attention to this point.

Road Races

If you wish to do the majority of your road race training actually on the road then that's up to your training around what you have read in the last forty pages or so you won't go far wrong. As I have already mentioned earlier each one of these programmes has been thoroughly tested and has brought success to hundreds of cyclists, many who thought they had reached the limit of their potential. Persevere with your chosen you, but I would strongly recommend some turbo work to give you that 'little bit extra' that can't be found on chain gangs. Try the following programmes for a couple of months and just see what an incredible difference it

makes to your performances. Give it a fair chance, the effect will be quick but not instant.

Try cutting your road mileage down to two sessions a week, of 40 and 60 miles one can be the weekly bash with the lads if you feel it does some good and incorporate the following programmes: 3, 5, 6,10 and 11 plus the odd 13 now and again and don't forget the No. 7 recovery sessions. Yes I know No. 6 is a road session, don't leave it out, if you are not a sprinter you soon will be if you do this session correctly. That's about it for basic guide lines, if you work training pattern, do not swap and change once you have decided on your regime.

The Psychology

Psychology? not really but you may find you have to play mind games on occasions before you can tackle a turbo session. I call it "roller nerves", you are not by yourself, everyone must get it to some degree now and again. It's perfectly understandable that you should try and talk yourself out of a session sometimes, after all it is the hardest and most demanding thing you have ever done, (if done correctly). The heart rate monitor constantly dictates to you, it's not really possible to have an "easy" session. You are just going to have to come to terms with the fact that you will have to suffer to improve but now, thanks to the H.R.M. none of your suffering is going to be wasted! If you find that you have this problem, then try and train early otherwise the mental conflict one can

suffer may ruin what otherwise would be a pleasant day. This is not always the case of course, more often than not the feeling is only of slight apprehension as before any hard training session. I have mentioned this point as everyone suffers at one time or another, just meet it face to face, it has to be done so get on with it, it's only pain and once you stop so will it!

Heart rate during events

This is a scale of approximate heart rates you should ride at during specific events. The percentages shown are of your 'Pulse deflection rate' NOT your 'Maximum heart rate'. You should be able to race at the heart rates shown when you are fit and fully rested. If you are over trained and therefore tired you will find difficulty in maintaining these heart rates during an event. These rates cannot relate to a road race as someone else usually dictates the speed.

When starting a time trial I suggest you ride up to your specific heart rate for that distance and hold it there. Do not go into oxygen debt first and then ease off, you will lose valuable time recovering.

Ten mile t.t. at 100% of Pulse Deflection Rate. (You may find that you can actually ride a ten mile T.T. slightly over 100%.)

25 mile t.t. at 97 - 100% of P.D.R. 50 mile t.t. =

92 - 95% of P.D R. 100 mile t.t. at 87 - 93% of P.D.R. 12 hour. t.t. at 80 - 83% of P.D.R.

Riding the event

Ideally for short races you should warm up to pulse deflection, you will find the actual start much easier if you do. Start your warm up by riding about seven miles briskly to get your heart rate up to somewhere around 80% of max. Then ten minutes or so before the actual start do some long hard intervals so that your heart rate is at pulse deflection two minutes before you are due to start. You should arrive at the start with your heart rate recovered to approx 65% of max., having warmed up in this manner you will find you are able to start faster and ride up to your racing heart rate quicker thus eliminating the 'jelly legs' syndrome so familiar to us all. As the race distances become greater the need to warm to racing heart rate becomes less important. Although having said that I have seen riders warming up for a 24hr. (true), old habits die hard! It has come to the point where I don't think I have much more to say on the subject. I could 'pad it out' with pages of irrelevant and useless information but that isn't my style so I will sum up on the next page and then call it a day. I hope you find the information useful, learn it like you would learn a language.

The Summary

I hope you haven't arrived at this point in the manual without learning something you didn't already know, if by chance you have, (seriously) then stick it back in the post and I will refund you by return. I have found, as I am sure you have that cyclists generally do not give away their secrets of success easily. Ten years ago I would have been pleased to pay a decent sum of money for the information in this manual I was so desperate to succeed in my chosen sport. I have since taught myself, both out of desperation and genuine interest, this knowledge I am now able to pass on to you for the price of a cheap training tub.

For details of my latest coaching services specialising in specific road and turbo training, heart monitoring technique and nutrition for racing cyclists and triathletes please send a s.a.e. to:

Peter Read, 'Holly Cottage' Wressle, Selby, North Yorkshire YO8 7ET.

All there is for me to do now is to wish you good luck, the rest is up to you.

Pete Read