

# **CompuTrainer<sup>TM</sup>**

## **Workout Manual**

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# Introduction

When you can't ride outdoors, there is no better way to train for cycling than with a CompuTrainer. In fact, many athletes train indoors on CompuTrainer even when the weather is perfect for riding since they know what can be accomplished - great workouts unaffected by traffic, stoplights, and flats.

Yet, if you are not familiar with all of the possibilities CompuTrainer offers, you can't derive optimal benefits from this versatile trainer. Doing the wrong things even on the best equipment won't improve performance.

Some cyclists who have become my clients were doing the same workouts on the same courses every day on their CompuTrainers. When I changed the way they used their trainers, their fitness improved and they learned that they could do more with a CompuTrainer than they had ever imagined.

This manual started as a set of workouts I designed for myself and my clients. Their feedback helped to refine the workouts and made a major contribution to the final product.

The workouts detailed in the manual are intended for a wide variety of bicycle riders including road racers, triathletes, duathletes, mountain bike racers, century riders, and fitness enthusiasts. The lines separating these types are often blurred as, for example, many road racers also race off-road, and some triathletes compete in road races. The many faceted cyclist can pick and choose the training regime he or she follows based on strengths, weaknesses, and goals.

The Training programs described here are intended for use with a CompuTrainer, but realistically, some workouts are better accomplished on the road. For example, some road racers need to do workouts longer than three hours. This is a long time to ride indoors and may be better done outside. Mountain bike racers need outdoor time working on handling skills such as fast descents on single track and obstacles. Time trial racers must learn through actual experience how best to cheat the wind with aerodynamic positioning.

This manual was originally written when the CompuTrainer was only sold as a Nintendo version. Therefore you will see two references for the tests and workouts: PC users need to load the PC Course indicated and Nintendo users need to load the NES Program indicated.

## Before Starting

If you:

- Are unaccustomed to vigorous exercise
- Have a family history of premature coronary heart disease (before age 55)
- Have pain in the chest, neck, shoulder, or arm during exercise
- Feel faint after mild exertion
- Have high blood pressure

Or

- Have been told that you have heart trouble

Then, **you should talk with your doctor** before starting this or any other exercise program.

## Workout Basics

Training on the CompuTrainer is just like training on the road, and the workouts should reflect that similarity. The basic principles governing your training remain the same: **specificity**, **progress**, and **overload**.

**Specificity** means training differently for different events. Getting ready for a time trial requires different training than getting ready for a criterium - training specific to the demands of that event. This manual includes specific CompuTrainer programs designed to meet the needs of road racers, mountain bikers, triathletes, duathletes, century riders, and fitness riders.

Regardless of your type of cycling, there are three workload elements to consider when deciding on a specific training program:

- How often to workout (frequency)
- How hard to workout (intensity)
- How long to workout (duration)

The frequency of exercise is determined by your goals. The higher your fitness goals or the more competitive you'd like to be, the more often you need to ride. While exercising three times a week may help you improve or maintain your fitness at the most basic level, it won't get you onto an Olympic team.

Exercise intensity is a measure of how hard your body is working. Training at levels from low to high stresses different body systems and produces different benefits. University studies have shown that high intensity training is the most effective way to gain maximal fitness, but this is also the area where errors of excess prevent many athletes from reaching their potential. The section on "Workout Heart Rates" will discuss intensity in greater detail.

The duration of exercise is better measured in minutes than miles. The body understands time, not distance. A twenty-mile ride for one person may take less than an hour, while another rider could take two hours on the same course. Regardless of the distance, they didn't do the same workout.

## Progressive Overload

**Progressive overload** is the notion that some aspect of the workload must be gradually increased to improve fitness. You must elevate either the frequency, intensity, or the duration of exercise. Racers with fewer than three years of experience should first expand their aerobic base and general fitness with greater duration and frequency before making significant increases in intensity. Fitness riders increase duration before intensity or frequency.

The workload must be increased in very small increments, usually of five to ten percent, in order to avoid overtraining and injury, and to allow for adaptation.

The most often neglected aspect of training for serious athletes is **adaptation**- what occurs in the body at the cellular level during recovery. It is during recovery that the body adapts to the stress of exercise and grows stronger and more fit. Without rest, a rider will soon be overtrained and his or her fitness will deteriorate.

The day after a stressful workout is usually a day completely off from exercise, or a day of very light activity. The higher the stress of the preceding hard workout, the longer the adaptation period needed. The shortest is 48 hours, but 72 hours is sometimes necessary, especially in the later stages of the training year, or when a rider has very low tolerance to physical stress. Reintroducing new stress too soon will interrupt the process of adaptation and soon result in reduced fitness.

## Workout Heart Rates

There are several ways to monitor your training intensity during a workout. Perceived effort and miles per hour are two of the more common ways, however, the most accurate measure of what your body is experiencing is heart rate. Your CompuTrainer comes equipped with a heart rate monitor with target training zone alarms. The workouts in this manual rely heavily on the use of this device.

Heart rate monitoring allows you to control intensity of your workouts and standardizes self-tests that measure progress. Training within scientifically established heart rate ranges can bring about great benefits. Working at low heart rates increases capillary beds. Improvement of fast twitch muscle function and increased tolerance to lactic acid result from high heart rate workouts.

Training “by the seat of your pants” was once a necessity - now it’s a handicap. Your heart rate monitor will allow you to get much more from your training than you ever did before.

Most systems for determining how to set up your heart rate training zones are based on set percentages of your maximum heart rate. The maximum heart rate can be estimated by subtracting your age from 220, or, if you’ve been very active for many years, by subtracting your age from 205. The resulting figure can be as much as twelve beats off according to university studies, so you may wind up working out either too hard or too easy.

Another method for finding your maximum heart rate is by sprinting up a steep hill with an all-out effort (this is NOT recommended). Few of us, however, can find the motivation to drive our heart rates that high short of having a gun at our heads. Around ninety-five percent of maximum, even the most dedicated will start feeling sorry themselves and question their sanity. The result of such a test usually yields numbers that are too low by seven to ten beats per minute.

The third method, and the one recommended, finds your anaerobic threshold heart rate using a variation of the Anaerobic Threshold Test that has been around since the early 1980’s. Anaerobic threshold (AT) is the level of intensity above which your body begins to accumulate lactic acid. For most fit cyclists, this falls in the range of 85 to 92 percent of maximum heart rate and is achievable with a less-than-maximal effort.

Before starting your training program, learn how to use your heart rate monitor by completing the Anaerobic Threshold Test. The version of the test you use depends on if your CompuTrainer has Ergometer/Calibration, which provides the more accurate of the two versions. After finding your AT, refer to Table 1 to determine your five training intensity zones.

## Heart Rate Zones

| <b>1 Zone</b> | <b>2 Zone</b> | <b>3 Zone</b> | <b>4 Zone</b> | <b>5 Zone</b>  |
|---------------|---------------|---------------|---------------|----------------|
| 90-108        | 109-122       | 123-128       | 129-136       | <b>137-150</b> |
| 91-109        | 110-123       | 124-129       | 130-137       | <b>138-151</b> |
| 91-109        | 110-124       | 125-130       | 131-138       | <b>139-152</b> |
| 92-110        | 111-125       | 126-130       | 131-139       | <b>140-153</b> |
| 92-111        | 112-125       | 126-131       | 132-140       | <b>141-154</b> |
| 93-112        | 113-126       | 127-132       | 133-141       | <b>142-155</b> |
| 94-112        | 113-127       | 128-133       | 134-142       | <b>143-156</b> |
| 94-113        | 114-128       | 129-134       | 135-143       | <b>144-157</b> |
| 95-114        | 115-129       | 130-135       | 136-144       | <b>145-158</b> |
| 95-115        | 116-130       | 131-136       | 137-145       | <b>146-159</b> |
| 97-116        | 117-131       | 132-137       | 138-146       | <b>147-161</b> |
| 97-117        | 118-132       | 133-138       | 139-147       | <b>148-162</b> |
| 98-118        | 119-133       | 134-139       | 140-148       | <b>149-163</b> |
| 98-119        | 120-134       | 135-140       | 141-149       | <b>150-164</b> |
| 99-120        | 121-134       | 135-141       | 142-150       | <b>151-165</b> |
| 100-121       | 122-135       | 136-142       | 143-151       | <b>152-166</b> |
| 100-122       | 123-136       | 137-142       | 143-152       | <b>153-167</b> |
| 101-123       | 124-137       | 138-143       | 144-153       | <b>154-168</b> |
| 101-124       | 125-138       | 139-144       | 145-154       | <b>155-169</b> |
| 102-125       | 126-138       | 139-145       | 146-155       | <b>156-170</b> |
| 103-126       | 127-140       | 141-146       | 147-156       | <b>157-171</b> |
| 104-127       | 127-141       | 142-147       | 148-157       | <b>158-173</b> |
| 104-128       | 129-142       | 143-148       | 149-158       | <b>159-174</b> |
| 105-129       | 130-143       | 144-148       | 149-159       | <b>160-175</b> |
| 106-129       | 130-143       | 144-150       | 151-160       | <b>161-176</b> |
| 106-130       | 131-144       | 145-151       | 152-161       | <b>162-177</b> |
| 107-131       | 132-145       | 146-152       | 153-162       | <b>163-178</b> |
| 107-132       | 133-146       | 147-153       | 154-163       | <b>164-179</b> |
| 108-133       | 134-147       | 148-154       | 155-164       | <b>165-180</b> |
| 109-134       | 135-148       | 149-154       | 155-165       | <b>166-181</b> |
| 109-135       | 136-149       | 150-155       | 156-166       | <b>167-182</b> |
| 110-136       | 137-150       | 151-156       | 157-167       | <b>168-183</b> |
| 111-137       | 138-151       | 152-157       | 158-168       | <b>169-185</b> |
| 112-138       | 139-151       | 152-158       | 159-169       | <b>170-186</b> |
| 112-139       | 140-152       | 153-160       | 161-170       | <b>171-187</b> |
| 113-140       | 141-153       | 154-160       | 161-171       | <b>172-188</b> |
| 113-141       | 142-154       | 155-161       | 162-172       | <b>173-189</b> |
| 114-142       | 143-155       | 156-162       | 163-173       | <b>174-190</b> |
| 115-143       | 144-156       | 157-163       | 164-174       | <b>175-191</b> |
| 115-144       | 145-157       | 158-164       | 165-175       | <b>176-192</b> |
| 116-145       | 146-158       | 159-165       | 166-176       | <b>177-193</b> |
| 116-146       | 147-159       | 160-166       | 167-177       | <b>178-194</b> |
| 117-147       | 148-160       | 161-166       | 167-178       | <b>179-195</b> |
| 118-148       | 149-160       | 161-167       | 168-179       | <b>180-197</b> |
| 119-149       | 150-161       | 162-168       | 169-180       | <b>181-198</b> |
| 119-150       | 151-162       | 163-170       | 171-181       | <b>182-199</b> |
| 120-151       | 152-163       | 164-171       | 172-182       | <b>183-200</b> |
| 121-152       | 153-164       | 165-172       | 173-183       | <b>184-201</b> |
| 121-153       | 154-165       | 166-172       | 173-184       | <b>185-202</b> |
| 122-154       | 155-166       | 167-173       | 174-185       | <b>186-203</b> |
| 122-155       | 156-167       | 168-174       | 175-186       | <b>187-204</b> |
| 123-156       | 157-168       | 169-175       | 176-187       | <b>188-205</b> |
| 124-157       | 158-169       | 170-176       | 177-188       | <b>189-206</b> |
| 124-158       | 159-170       | 171-177       | 178-189       | <b>190-207</b> |
| 125-159       | 160-170       | 171-178       | 179-190       | <b>191-208</b> |
| 125-160       | 161-171       | 172-178       | 179-191       | <b>192-209</b> |
| 126-161       | 162-172       | 173-179       | 180-192       | <b>193-210</b> |
| 127-162       | 163-173       | 174-180       | 181-193       | <b>194-211</b> |
| 127-163       | 164-174       | 175-181       | 182-194       | <b>195-212</b> |

# Power-Time-Weight Comparisons

This table compares average power in watts to 40 km time trial times on a flat course for three hypothetical riders of different combined bike and body weights (120 lbs, 150 lbs, and 180 lbs).

| 120 Pounds |         |           | 150 Pounds |         |           | 180 Pounds |         |           |
|------------|---------|-----------|------------|---------|-----------|------------|---------|-----------|
| Watts      | Time    | Avg Speed | Watts      | Time    | Avg Speed | Watts      | Time    | Avg Speed |
| 150        | 1:18:21 | 19.0      | 150        | 1:20:28 | 18.5      | 150        | 1:21:56 | 18.2      |
| 160        | 1:17:32 | 19.2      | 160        | 1:18:22 | 19.0      | 160        | 1:20:29 | 18.5      |
| 170        | 1:16:07 | 19.6      | 170        | 1:17:24 | 19.2      | 170        | 1:18:22 | 19.0      |
| 180        | 1:13:31 | 20.3      | 180        | 1:14:16 | 20.1      | 180        | 1:16:09 | 19.6      |
| 190        | 1:12:24 | 20.6      | 190        | 1:13:32 | 20.3      | 190        | 1:14:18 | 20.0      |
| 200        | 1:11:37 | 20.8      | 200        | 1:12:27 | 20.6      | 200        | 1:13:33 | 20.2      |
| 210        | 1:09:41 | 21.4      | 210        | 1:10:21 | 21.2      | 210        | 1:10:40 | 20.8      |
| 220        | 1:08:41 | 21.7      | 220        | 1:09:44 | 21.4      | 220        | 1:10:23 | 21.2      |
| 230        | 1:08:07 | 21.9      | 230        | 1:08:07 | 21.9      | 230        | 1:09:45 | 21.3      |
| 240        | 1:06:24 | 22.4      | 240        | 1:06:58 | 22.2      | 240        | 1:08:11 | 21.8      |
| 250        | 1:05:30 | 22.7      | 250        | 1:06:25 | 22.4      | 250        | 1:07:00 | 22.2      |
| 260        | 1:04:59 | 22.9      | 260        | 1:05:32 | 22.7      | 260        | 1:06:27 | 22.4      |
| 270        | 1:03:27 | 23.5      | 270        | 1:03:58 | 23.3      | 270        | 1:05:04 | 22.9      |
| 280        | 1:02:38 | 23.8      | 280        | 1:03:29 | 23.5      | 280        | 1:04:00 | 23.3      |
| 290        | 1:02:10 | 23.9      | 290        | 1:02:46 | 23.7      | 290        | 1:03:31 | 23.4      |
| 300        | 1:00:50 | 24.5      | 300        | 1:01:21 | 24.3      | 300        | 1:02:21 | 23.9      |
| 310        | 1:00:07 | 24.8      | 310        | 1:00:54 | 24.4      | 310        | 1:01:23 | 24.3      |
| 320        | 0:59:56 | 24.8      | 320        | 1:00:42 | 24.5      | 320        | 1:01:11 | 24.3      |
| 330        | 0:58:39 | 25.4      | 330        | 0:59:34 | 25.0      | 330        | 1:00:02 | 24.8      |
| 340        | 0:58:19 | 25.5      | 340        | 0:58:46 | 25.3      | 340        | 0:59:41 | 24.9      |
| 350        | 0:57:40 | 25.8      | 350        | 0:58:23 | 25.5      | 350        | 0:58:47 | 25.3      |
| 360        | 0:57:08 | 26.1      | 360        | 0:57:33 | 25.9      | 360        | 0:58:15 | 25.6      |
| 370        | 0:56:24 | 26.4      | 370        | 0:57:14 | 26.0      | 370        | 0:57:40 | 25.8      |
| 380        | 0:56:03 | 26.6      | 380        | 0:56:27 | 26.4      | 380        | 0:57:18 | 26.0      |
| 390        | 0:55:21 | 26.9      | 390        | 0:55:56 | 26.6      | 390        | 0:56:21 | 26.4      |
| 400        | 0:55:01 | 27.0      | 400        | 0:55:24 | 26.9      | 400        | 0:56:03 | 26.6      |

## Self-Testing

The CompuTrainer is like having a physiology lab at home. It is ideal for testing your progress on a regular basis. Besides the Anaerobic Threshold Test for anaerobic threshold, you can also measure the progress of your aerobic fitness and power. These tests are in the “Tests” section of this HTML workbook, beginning with “calibration” and ending with “ramp”.

Aerobic fitness is the most basic element of endurance and can be measured using the Aerobic Time Trial. The test is conducted at an effort well below your anaerobic threshold. As you improve, your heart rate will be lower given the same work load, and your time, on a standard course at the heart rate, will drop. The Ramp can provide similar information in addition to keeping you informed of possible overtraining.

Power is a basic indicator of sprinting and climbing ability. The more power you have, the easier you will find any ride, even those that are flat. With power in reserve, you always have the option of physiologically “shifting gears” by applying more force to the pedals. Power is crucial to road racing and mountain biking. By testing yours periodically you can monitor progress in this area.

Test aerobic fitness and power every four to eight weeks during the Base and Build periods. See Power-Time-Weight Comparisons table for related comparisons.

## Periodization

Today’s high performance athletes train using a system called “periodization”. This means dividing the training year into periods, each with a specific physiological purpose. By doing this, the competitive athlete builds fitness in stages, much as a house is built. When a period is completed, the fitness benefits gained are maintained in the following period while new aspects of conditioning are introduced.

This manual uses five periods within a season: Base, Build, Peak, Race, and Recovery. Two to twelve weeks are generally assigned to each period, but this will vary with the individual.

The **Base** period will improve general fitness. You are “training to train” by emphasizing endurance, strength training, form work, and flexibility. This period lasts eight to twelve weeks depending on your experience level. Athletes who have been competing for three or more years need only stay in Base for eight weeks. Less experienced cyclists will train at this level for twelve weeks to ensure an adequate fitness level is established. This is the most important period for the novice cyclist and may even be extended beyond twelve weeks to achieve greater fitness depth. Fitness riders use this period exclusively.

During **Base**, the focus is on quantity with limited intensity, but there is a gradual shifting toward quality in preparation for the Build period. The increased intensity comes mostly from economy refinement. “Economy” is just another way of describing “form” - the ability to turn the cranks without wasting energy. For example, if you continue to apply force to the pedal when it is at the bottom of the stroke, all of the energy expended is wasted. At very high cadences, you’ll feel this as you bounce up and down on the saddle. Learning to make effortless circles will eventually pay off as you expend less energy at higher intensities.

To allow your body to recover from the acclimated stress during this and every subsequent period, reduce the volume of training during the fourth week of every four-week block. During this week, don’t do any long or intense workouts. Ride easily, work on form, and take some well-deserved time off to recover and allow your body to adapt.



The **Build** period is four to twelve weeks long and develops more race-specific fitness. Intensity increases steadily and carefully with emphasis on power enhancement and intervals of increasing intensities and duration. Endurance training is maintained at the levels attained during Base. It is the most demanding of the five periods due to the high endurance level and the increased intensity. The initial Build period is usually on the training calendar when the weather is worst in the northern latitudes, making the CompuTrainer invaluable.

Cyclists with fewer than three years of experience who extend the Base period to twelve weeks shorten the Build period by four weeks.

The development of power is critical for the competitive cyclist. Grinding slowly up hills in a big gear builds strength, not power. Power improvement comes from improving the ability to turn progressively harder gears at a high cadence for increasingly longer periods. The first Build training block emphasizes this fitness skill.

Interval training during the Build period begins with long repetitions at an intensity just below anaerobic and progresses to higher intensity as the legs adapt to the power training. The *volume* of intensity attained in individual workouts is the key to success in this period.

Just as you did in the Base period, you should reduce the volume of your training in every fourth week of Build. You'll look forward to the extra rest and grow stronger because of it.

The two- to six-week **Peak** period emphasizes intensity and commences once intensity has reached a high volume in the Build period. Now total weekly training volume is reduced as intensity peaks. The emphasis on speed and speed-endurance (the ability to maintain race speed). Workouts are event-specific to prepare for major competitions of the season. There may be some "tune-up" events during this period to test progress.

During Peak, training is either in a "speed-spectrum" of 90-110% of race speed, or very easy for recovery and preparation for the next high quality workout. Training efforts between these two extremes reduce the energy available for improving quality and do not bring greater fitness.

The **Race** period lasts up to eight weeks. It is very difficult to maintain peak fitness for any longer than eight weeks. During this time, you may be racing frequently, perhaps twice a week if you're a road racer, or simulating a race every other week if you're a triathlete. Great care must be taken to ensure recovery. If you do any training other than low-intensity recovery workouts during this period, it should be to refine strengths or prepare for a specific event such as a time trial or stage race. Working on strengths after so many months of striving to improve general fitness and addressing weaknesses is good for confidence - something we can all use more of in races.

A trend of the last few years among elite endurance athletes is to peak twice during the calendar year. The twin-peak year seems to bring the athlete's fitness along at a crisper pace, maintains great enthusiasm, and creates a higher level of fitness for the second peak. It also fits nicely into a season which has more important events early in the year and again in the fall. The training programs suggested in this manual are written to accommodate the twin-peak concept.

The **Recovery** period brings the season to a close and allows the athlete to rest and recover, both mentally and physically, from the stresses of training and racing for several weeks. The emphasis is on the unstructured activity in a variety of pursuits. This period generally lasts two to four weeks, but may be longer following an event such as the Ironman or a particularly grueling season.

The training programs in this Workout Manual are designed around these five periods. Each section is devoted to a different type of cyclist and incorporates all of the principles and periods discussed here. By following the recommended progression, you will be training to race as most elite athletes train.

# Periodization

## Year at a Glance

### Peak 1

| Period       | When                 | Purpose              | Focus                            | Workouts  |
|--------------|----------------------|----------------------|----------------------------------|---|
| <b>Base</b>  | Nov-Dec<br>8 weeks   | Train to train       | Endurance<br>Strength<br>Economy | Easy Distance<br>Weights<br>Quick form                              |
| <b>Build</b> | Jan-Mar<br>12 weeks  | Increase specificity | Power<br>Intervals<br>Endurance  | Hill repeats/Sprints<br>2-6 minutes, 90% MHR<br>Cruise Intvls/Tempo |
| <b>Peak</b>  | Apr<br>4 weeks       | Race preparation     | Speed-endurance<br>Tune-up races | Simulations<br>Race without tapering                                |
| <b>Race</b>  | May-Jun<br>4-8 weeks | Race and recover     | Refine strengths<br>Race         | Varies<br>Race or simulation  |
| Recover      | Jul<br>1-2 weeks     | R & R                | Fun                              | Only if you<br>feel like it   |

### Peak 2

| Period       | When               | Purpose          | Focus                            | Workouts  |
|--------------|--------------------|------------------|----------------------------------|---|
| <b>Build</b> | Jul-Aug<br>4 weeks | Rebuild fitness  | Power<br>Intervals<br>Endurance  | Hill repeats/Sprints<br>2-6 minutes, 90% MHR<br>Cruise Intvls/Tempo |
| <b>Peak</b>  | Aug<br>2 weeks     | Race Preparation | Speed-endurance<br>Tune-up races | Race without tapering<br>Race without tapering                      |
| <b>Race</b>  | Sep<br>4 weeks     | Race and recover | Refine strengths<br>Race         | Varies<br>Race or simulation  |
| Recover      | Oct<br>4 weeks     | R & R            | Fun                              | Only if you feel like it  |

## Warm Up and Cool Down

Warm-up is necessary before every high quality workout to ensure that the muscles are working efficiently and that your energy production systems are up to speed. Jumping on your bike and starting a hard interval session or motor pacing right away is not only hard on your body, but also won't improve your fitness as much as following a warm-up.

After you've completed the hard part of the workouts, begin a cool down by doing a mirror-image of your warm-up. Allow the pulse to drop steadily as the legs continue to turn the cranks at a comfortable cadence while decreasing resistance.

The "Ramp" (described in the Ramp section of "Tests") serves as an excellent warm-up before an intense workout. It can also tell whether you are recovered and ready for a tough ride.

## Training Programs and Ability Levels

The following sections describe annual training plans for riders in several categories. They are intended as examples only. Individual strengths and weaknesses, time available, and motivation should guide you in determining your specific plan. Several of the workouts give time ranges, such as one to three hours, or a range of repetitions to perform at a given distance or time. If you are new to the sport, use the lesser numbers. Experienced riders may increase suggested times and distances.

The training programs described here are listed by calendar months since races tend to occur at set times each year. While this calendar may be optimal for racing in some parts of the country, you may need to alter the timing of the periods to fit your needs.

For racers who have been competing for less than three years, complete the Base 2 training block twice and omit Build 3. This will boost your endurance, the most important element for the novice.

Fitness can best be developed by building to progressively higher levels for each of the first three weeks of every four-week block by increasing duration and/or intensity. To ensure recovery, the fourth week of each four-week training block should have total training time and intensity reduced to approximately 50% of the previous weeks' levels.

CompuTrainer workouts referenced by number in these schedules are explained in detail starting in the Workouts section.

The workouts frequently call for a "rolling course." This is a course that typically has hills with grades less than 4% and which allows you to keep your pulse in the prescribed zone.

# Road Racers

Road racers are the most multifaceted of cyclists and their training reflects their diversity. A broad range of physical abilities are needed for road races and criteriums: endurance for races lasting longer than three hours; speed-endurance for pulling, bridging, and breaking away; sprint speed for criteriums, primes, and finishes; and great hill-climbing power. The following program is designed to improve the road racer's fitness in each of these areas.

## ***Base Period (November-December)***

The Base period lasts eight weeks with most cyclists entering this period in November and ready to move onto the Build period in January. The purpose is to increase strength for later conversion to power, improve endurance, and refine pedaling mechanics.

### ***Base 1 (November)***

During the first four weeks of the base period, in addition to lifting weights two or three times a week, the road racer should engage in low intensity endurance cross-training activities such as cross-country skiing, snowshoeing, hiking, or running (note that heart rate zones are not the same for all sports). Two times a week, ride the CompuTrainer for endurance.

#### **Road Racer - Base 1**

|                  |   |
|------------------|---|
| <b>Monday</b>    | Strength training.  |
| <b>Tuesday</b>   | CompuTrainer: Ride 1-3 hours in 1-2 intensity zones on a course with rolling hills. Use the small chain ring with cadence at about 90rpm. Stay in the saddle on hills to help build hip extension power, but be cautious with your knees. |
| <b>Wednesday</b> | Strength training or day off.   |
| <b>Thursday</b>  | Cross train 1-3 hours; easy.  |
| <b>Friday</b>    | Strength training. Same as on Monday.   |
| <b>Saturday</b>  | Same as on Tuesday.   |
| <b>Sunday</b>    | Cross train 1-3 hours; easy.  |

### ***Base 2 (December)***

In the second four weeks of the Base period, decrease the number of days spent in strength training and general fitness activities while increasing the number of days on the bike to three or four. Endurance rides still comprise the bulk of the workouts, but form workouts using SpinScan are also employed. If you have been racing for less than three years, complete this block twice.

## **Road Racer - Base 2 (December)**

|                                  |   |
|----------------------------------|---|
| <b>Monday</b>                    | Strength training.  |
| <b>Tuesday</b>                   | CompuTrainer and road: Ride 2-5 hours on a course with rolling hills staying in 1-3 zones. Use both the small and large chain rings with cadence at about 90rpm. Stay in saddle on hills to help build hip extension power. Be careful with knees on hills. |
| <b>Wednesday</b>                 | Cross train (easy) one hour or day off.   |
| <b>Thursday</b><br>Form Sprints. | CompuTrainer: Work on form. See Isolated Leg Training, Spin Step Ups, and   |
| <b>Friday</b>                    | Strength training.  |
| <b>Saturday</b>                  | Same as Tuesday   |
| <b>Sunday</b>                    | Same as Thursday  |

## ***Build Period (January-March and July)***

The Build Period is divided into three four-week blocks and is the most stressful of the five periods. During this period weekly training intensity is brought to its highest volume, not necessarily highest intensity, of the year. Be sure to allow for recovery following high quality workouts to avoid overtraining during this period.

### ***Build 1 (January)***

The first four-week block is devoted to improving power in preparation for the speed phase of training. Strength training is decreased while endurance is maintained.

## **Road Racer - Build 1 (January)**

|                  |  |
|------------------|--|
| <b>Monday</b>    | Strength training or day off.  |
| <b>Tuesday</b>   | CompuTrainer: Power Repeats.   |
| <b>Wednesday</b> | CompuTrainer: Ride 2-5 hours in 1-2 intensity zones on a course with rolling hills. Use the small chain ring with cadence at about 90rpm. Stay in saddle on hills to help build hip extension power. Be careful with knees on hills. |
| <b>Thursday</b>  | CompuTrainer: Motorpaced Cruise Intervals  |
| <b>Friday</b>    | Strength training.   |
| <b>Saturday</b>  | Same as Tuesday  |
| <b>Sunday</b>    | Same as Wednesday  |

## ***Build 2 (February)***

During this block, power work gives way to interval training while endurance training becomes more intense, taking on the characteristics of road racing.

### **Road Racer - Build 2 (February)**

|                  |   |
|------------------|---|
| <b>Monday</b>    | Off.  |
| <b>Tuesday</b>   | CompuTrainer: Intervals: Descending Intervals, Motorpaced Intervals, Progressive Intervals, or Rollercoaster.   |
| <b>Wednesday</b> | CompuTrainer and road: Ride 2-5 hours in 1-2 intensity zones on a gently rolling course. Use both the small and large chain rings with cadence at about 90rpm Cross train (easy) one hour or day off.   |
| <b>Thursday</b>  | CompuTrainer: Ride 1-3 hours in 1-4 zones (avoid 5) on a hilly course with long climbs such as the Morgul-Bismarck. Most of your climbing should be in the saddle to build/maintain hip-extension power.  |
| <b>Friday</b>    | Strength training. <b>Saturday</b> Road: 1-3 hour group ride on rolling terrain in all intensity zones. OR CompuTrainer: 1-3 hours in all intensity zones. Motorpaced Tempo Training. Then race Pacer at a high power setting with draft "ON" over a course of your choice. |
| <b>Sunday</b>    | CompuTrainer and road: Ride 2-5 hours in 1-2 intensity zones on a gently rolling course. Use the small chain ring with cadence at about 90rpm.  |

## ***Build 3 (March and July)***

Build 3 will improve your speed-endurance - the ability to maintain a relatively high intensity for a long time - while improving your climbing. Spring ability and endurance are maintained. Preparation for back to back weekend races and stage racing beg ins. Repeat this block in July, following a week of rest, to rebuild fitness before fall races. If the last part of your race season is criteriums only, use only the "B" week option. Six weeks before a major stage race, repeat this block, making the final two weeks before the race a taper. If you have been racing for less than three years, omit this block.

### **Road Racer - Build 3 (March and July)**

#### **"A" Week**

Monday Off.

|                  |   |
|------------------|---|
| <b>Tuesday</b>   | CompuTrainer: Long Hill Repeats or Progressive Intervals.   |
| <b>Wednesday</b> | CompuTrainer: Motorpaced Cruise Intervals.  |
| <b>Thursday</b>  | CompuTrainer: Ride 1-2 hours in one intensity zone on a mostly flat course. Use the small chain ring with cadence at about 90rpm.   |
| <b>Friday</b>    | Strength training AND/OR CompuTrainer Sprint Workouts: Crit Sprints, Hill Sprints, OR Motorpaced Sprints.   |
| <b>Saturday</b>  | Road: 1-3 hour group ride on rolling and hilly terrain in all intensity zones OR CompuTrainer: 1-3 hours in all intensity zones. Motorpaced Tempo. If you are an advanced-level road racer, also race the Pacer at a high power setting with draft "ON" over a course of your choice. |
| <b>Sunday</b>    | CompuTrainer and/or road: Ride 2-5 hours in 1-2 intensity zones on a gently rolling course. Use the small chain ring with cadence at about 90rpm.   |

### **"B" Week**

|           |   |
|-----------|---|
| Monday    | Off.  |
| Tuesday   | CompuTrainer: Long Hill Repeats.  |
| Wednesday | CompuTrainer: Ride 1-2 hours in one intensity zone on a mostly flat course. Use the small chain ring with cadence at about 90rpm.   |
| Thursday  | CompuTrainer: Motorpaced Cruise Intervals.  |
| Friday    | Strength training.  |
| Saturday  | Road: 1-3 hour group ride on rolling terrain in all intensity zones OR CompuTrainer: 1-3 hours in all intensity zones. See Motorpaced Tempo Training. Then race Pacer at a high power setting with draft "ON" over a course of your choice. |
| Sunday    | CompuTrainer and/or road: Ride 2-5 hours in 1-2   |

### ***Peak Period (April and August)***

The Peak period will prepare you for competition with race-stress simulations. Rest between high quality workouts is increased as the intensity of training increases. Volume is decreased. In April you may have your first serious races. For a two-peak season, return to this block in August following Build 3.

### **Road Racer - Peak (April and August)**

|           |  |
|-----------|--|
| Monday    | Off.   |
| Tuesday   | CompuTrainer: Ride 1-2 hours on a course with rolling hills in 1-2 zones.  |
| Wednesday | CompuTrainer: Hill Sprints or Rollercoaster.   |
| Thursday  | CompuTrainer: Ride 1-3 hours in one intensity zone on a mostly flat course. Use small chain ring with cadence at about 90rpm.                        |
| Friday    | CompuTrainer: Ride 1-3 hours on a course with rolling hills in 1-2 zones.  |
| Saturday  | Race OR CompuTrainer: Race the Pacer on a challenging course with Pacer's level set high. Attempt to break away by the half way point of the course. |
| Sunday    | Same as yesterday.   |

### ***Race Period (May-June and September)***

Emphasis of the Race period is on maintaining high level fitness with a high-quality session at midweek that focuses on your strengths, and a weekend race or simulation. You must be rested for each of the major races on your schedule. If you have an important stage race coming up, plan ahead so you return to Build 3 six weeks prior to the stage race. Taper for the last two weeks before the race stage.

## **Road Racer - Race (May-June and September)**

|                  |  |
|------------------|--|
| <b>Monday</b>    | Off. OR CompuTrainer: Spin and Stand Alone Mode for 1-2 hours.   |
| <b>Tuesday</b>   | CompuTrainer (Sprints): Form Sprints or Hill Sprints.  |
| <b>Wednesday</b> | CompuTrainer: Select one of these to maintain your strongest or most important area of fitness for upcoming races. Long Hill Repeats, (Time Trial Workouts) Progressive Intervals, Motorpaced Tempo, Motorpaced Cruise Intervals, or (Speed-endurance Workout) Descending Intervals. |
| <b>Thursday</b>  | CompuTrainer: Spin in Stand Alone Mode for 1-2 hours.  |
| <b>Friday</b>    | CompuTrainer: Ride a gently rolling course for 1-2 hours including 3-5 sprints. See Motorpaced Sprints.  |
| <b>Saturday</b>  | Race or group ride.  |
| <b>Sunday</b>    | Race or group ride.  |

## ***Recovery Period (October)***

Recovery is a time to rest and recover fully from the stresses of the previous race season before starting preparations for another race season. All activities this month are unstructured with the emphasis on enjoyment of other pursuits. The CompuTrainer should be used for fun workouts. This is a time to design workouts for your own training based on what you have learned about your strengths and weaknesses in the previous season.



# Mountain Bikers

The fastest growing segment of cycling has unique requirements including excellent upper body strength, power for climbing very steep hills, sprint speed, and speed-endurance.

## ***Base Period (November-December)***

The eight-week Base period will improve endurance and strength and prepare you to do more race-specific training during the Build period.

### ***Base 1 (November)***

Strength training is very important for the mountain biker. Climbing and handling the bike on rugged terrain require good total-body strength. Focus on developing strength for the biceps and triceps, chest and upper back, abdominal and lower back, quadriceps and hamstrings, and calves. Exercises should mimic on-bike positions as closely as possible. Cross-training activities such as cross-country skiing, snowshoeing, hiking, or running are encouraged.

#### **Mountain Biker - Base 1 (November)**

|                  |   |
|------------------|---|
| <b>Monday</b>    | Strength Training.  |
| <b>Tuesday</b>   | CompuTrainer: Ride 1-3 hours in 1-2 intensity zones on a course with rolling hills. Maintain cadence at about 90rpm. Stay in the saddle on hills to build hip extension power, but be cautious with your knees. |
| <b>Wednesday</b> | Strength training or day off.   |
| <b>Thursday</b>  | Cross-train 1-3 hours; easy.  |
| <b>Friday</b>    | Strength training same as on Monday.  |
| <b>Saturday</b>  | Same as on Tuesday  |
| <b>Sunday</b>    | Cross-train 1-3 hours; easy.  |

### ***Base 2 (December)***

During Base 2 on-bike training is increased with the emphasis still on endurance, but form workouts using Spin Scan are introduced. If you have been racing for less than three years, complete the Base 2 block twice to boost your endurance before going on to the Build period.

## **Mountain Biker - Base 2 (December)**

|                  |  |
|------------------|--|
| <b>Monday</b>    | Strength training.   |
| <b>Tuesday</b>   | CompuTrainer and road: Ride 2-4 hours on a course with rolling hills. Maintain heart rate in 1-3 zones while staying in the saddle on hills. Use both small and big chain rings. |
| <b>Wednesday</b> | Cross-train one hour easy or day off.  |
| <b>Thursday</b>  | CompuTrainer: Work on form. Isolated Leg Training, Spin Step Ups, or Form Sprints.   |
| <b>Friday</b>    | Same as Monday   |
| <b>Saturday</b>  | Same as Tuesday.   |
| <b>Sunday</b>    | Same as Thursday   |

## ***Build Period (January-March)***

This twelve-week training period will place the greatest stress on the mountain biker. The emphasis moves toward race-specific training while endurance is maintained. By the end of the period, the rider may be doing tune-up races.

### ***Build 1 (January)***

Build 1 begins to convert the strength of the weight room to power for hill climbing and sprinting - areas which will be further developed in parts 2 and 3 of the Build period.

## **Mountain Biker - Build 1 (January)**

|                  |  |
|------------------|--|
| <b>Monday</b>    | Strength training or off.  |
| <b>Tuesday</b>   | CompuTrainer: Power Repeats.   |
| <b>Wednesday</b> | CompuTrainer and road: Ride 2-4 hours in 1-3 zones on a course with rolling hills. Both large and small chain rings. Stay in saddle on hills to build hip power. Be cautious with knees. |
| <b>Thursday</b>  | CompuTrainer: Motorpaced Cruise Intervals OR CompuTrainer: Ride a rolling course very aggressively in all intensity zones.   |
| <b>Friday</b>    | Strength training.   |
| <b>Saturday</b>  | CompuTrainer: Include Power Repeats in the middle of a 1-2 hour ride on a hilly course that uses all intensity zones.  |
| <b>Sunday</b>    | CompuTrainer and road: Ride 1-4 hours in 1-2 zones on a rolling course. Stay in saddle for power building.   |

## ***Build 2 (February)***

During this training block, hill work becomes more aggressive and the weekend ride becomes more race-like.

### **Mountain Biker - Build 2 (February)**

|                  |  |
|------------------|--|
| <b>Monday</b>    | Off.   |
| <b>Tuesday</b>   | CompuTrainer: Short Hill Repeats.  |
| <b>Wednesday</b> | CompuTrainer: Ride 2-4 hours in 1-2 zones on a gently rolling course. Use an easy gear keeping cadence at 90rpm or higher.                           |
| <b>Thursday</b>  | CompuTrainer: Long Hill Repeats.   |
| <b>Friday</b>    | Strength training.   |
| <b>Saturday</b>  | CompuTrainer: Ride 1-2 hours on a hilly course in all intensity zones with the draft off.  |
| <b>Sunday</b>    | Same as Wednesday OR Ride off-road for 1-3 hours working on handling skills, especially descents. Keep pulse as low as possible during this workout. |

## ***Build 3 (March and July)***

This training block will improve your sprint while maintaining endurance and hill climbing. The first tune-up races may be scheduled in March. Return to this block in July to rebuild fitness before fall races after one week off to allow for recovery. If you have been racing for less than three years, omit the Build 3 block.

### **Mountain Biker - Build 3 (March and July)**

|                  |   |
|------------------|---|
| <b>Monday</b>    | Off.  |
| <b>Tuesday</b>   | CompuTrainer: Hill Sprints or Rollercoaster.  |
| <b>Wednesday</b> | CompuTrainer: Ride 2-4 hours in the 1-2 zones on a gently rolling course. Use an easy gear keeping cadence at 90rpm or higher.  |
| <b>Thursday</b>  | CompuTrainer: Descending Intervals.   |
| <b>Friday</b>    | Strength training. May also want to spin easily on CompuTrainer in Stand Alone Mode or SpinScan.  |
| <b>Saturday</b>  | CompuTrainer: 1-2 hours in all intensity zones. Motorpaced Tempo. If you are an experienced mountain biker, also race the Pacer at a high power setting with draft off on a course of your choice. OR Off Road: 1-3 hour group ride at all intensities on a hilly course. |
| <b>Sunday</b>    | Same as Wednesday OR Ride off-road for 1-3 hours working on handling skills, especially descents. Keep pulse as low as possible during this workout.  |

## ***Peak Period (April and August)***

The Peak period puts the final touches on your fitness and prepares you for the stresses of mountain bike racing. Training volume should be greatly decreased as all emphasis is on intensity. Return to this period in August after rebuilding your fitness with Base 3 for fall races.

### **Mountain Biker - Peak (April and August)**

|                  |  |
|------------------|--|
| <b>Monday</b>    | Off.   |
| <b>Tuesday</b>   | CompuTrainer: Ride 1-2 hours on a course with rolling hills in the 1-2 zones.  |
| <b>Wednesday</b> | CompuTrainer: 3-5 Short Hill Repeats followed by one trip on the Progressive Intervals Course. This is a very stressful workout. You must be rested for it.                                  |
| <b>Thursday</b>  | Off, if a beginning rider. OR, if advanced... CompuTrainer: Ride 1-2 hours on a flat course in the 1 zone. Use an easy gear. Active recovery day.  |
| <b>Friday</b>    | CompuTrainer: Ride 1-3 hours on a gently rolling course in the 1-2 zones. Stay in saddle to maintain hip extension power.  |
| <b>Saturday</b>  | Race OR, if racing tomorrow...Off-Road: 1-2 hours working on handling skills. Include several foot-on-the-ground race starts. OR, if not racing tomorrow... CompuTrainer: Same as Wednesday. |
| <b>Sunday</b>    | Race OR, if raced yesterday or repeated Wednesday's workout... Off-Road: 1-3 hours working on handling skills. Low effort. Include several foot-on-the-ground race starts.                   |

## ***Race Period (May-June and September)***

Now is the time to take advantage of your hard-earned fitness on the weekends. There will be one hard training session at midweek that builds on your strength area. It's important that you are rested for weekend races or simulations.

## **Mountain Biker - Race (May-June and September)**

|                  |   |
|------------------|---|
| <b>Monday</b>    | Off OR CompuTrainer: Spin in Stand Alone Mode for one hour.   |
| <b>Tuesday</b>   | CompuTrainer Sprints: Hill Sprints or Form Sprints.   |
| <b>Wednesday</b> | CompuTrainer: Select one of these to maintain or improve your strongest or most important area of fitness for upcoming races: Long Hill Repeats, or Anaerobic Threshold.  |
| <b>Thursday</b>  | CompuTrainer: Spin in Stand Alone Mode for 1-2 hours in 1 zone.   |
| <b>Friday</b>    | Same as Tuesday.  |
| <b>Saturday</b>  | Race OR, if racing tomorrow... Off-Road: 1-2 hours working on handling skills or checking out course in 1-2 intensity zones. Include several foot-on-the-ground race starts. OR, if no race tomorrow... CompuTrainer: 3-5 Short Hill Repeats followed by one trip on the Progressive Intervals Course. This is a very stressful workout. You must be rested for it. |
| <b>Sunday</b>    | Race OR, if raced yesterday... Off-Road: 1-3 hours working on handling skills in 1-2 intensity zones. Include several foot-on-the-ground race starts.   |

## ***Recovery Period (October)***

This is the time to rest and recover from the previous season. If you ride at all on your CompuTrainer this month, it should be unstructured and for fun. This is a good time to pursue other interests in life while reflecting on what you learned about your mountain bike racing in the past year.

# Triathletes and Duathletes

Time trials that last from a few minutes, as in a sprint-distance race, to a few hours, as in the Ironman Triathlon, test the limits of both physical and mental ability. No one is going to help - you're on your own out there. The advantage of training for the time trial is that the range of physical talents needed is narrowed. Raw endurance and speed-endurance top the list, depending on the length of the race.

This section is divided into *short*-distance and *long*-distance training programs. For the purposes of this manual, short distance includes races with a bike leg of less than forty miles as this distance takes two hours or less to complete for most athletes. Events with bike legs lasting longer than forty miles/two hours have an increasingly greater endurance component with less reliance on speed and power.

The long-distance training periods have been modified, assuming the athlete will race immediately at the end of the Peak period. There is no Race period as a result. Also missing are calendar-training months since the training program will bring you to a peak for a race which could be at any time of the year.

The following schedules do not include the swim and run training portions which are beyond the scope of this manual. If running and/or swimming is a weaker event for you than is cycling, you may want to reduce the intensity and/or volume of one of the higher quality bike workouts each week so that you have more energy to put into the other sports.

## ***Base Period - Short Distance (November-December)***

The Base period is eight weeks and is designed to improve endurance, strength, and pedaling technique.

### ***Base 1 (November)***

In Base 1, the multisport athlete works on strength in the weight room two or three times a week. Later, this strength will convert to power on the bike. Include exercises that work all the major muscle groups used in swimming, cycling, and running. The cycling-specific exercises may include squats, step-ups, or leg presses that improve hip-extension strength, critical to success on the bike. Endurance work may include other sports such as cross-country skiing, snowshoeing, or hiking. Ride your CompuTrainer at least twice a week.

### **Base 1 (Short) - Triathlete/Duathlete (November)**

|                  |  |
|------------------|--|
| <b>Monday</b>    | Stength training.  |
| <b>Tuesday</b>   | CompuTrainer: Ride 1-2 hours in 1-2 density zones on a course with rolling hills. Use the small chain ring with cadence at about 90rpm. Stay in the saddle on hills to build up hip power. |
| <b>Wednesday</b> | Stength training or day off  |
| <b>Thursday</b>  | Endurance train for 1-3 hours at very low effort. Can be running and/or swimming.  |
| <b>Friday</b>    | Same as Monday.  |
| <b>Saturday</b>  | Same as Tuesday.   |
| <b>Sunday</b>    | Same as Thursday.  |

### **Base 2 (December)**

Strength training is reduced this block, but endurance volume on the bike is increased with intensities remaining low. SpinScan is used to improve pedaling technique.

### **Base 2 (Short) - Triathlete/Duathlete (December)**

|                  |   |
|------------------|---|
| <b>Monday</b>    | Strength training   |
| <b>Tuesday</b>   | CompuTrainer and road: Ride 1-3 hours on a course with rolling hills staying in 1-3 zones. Use both small and big chain rings with cadence at about 90rpm. Stay in saddle on hills to build greater hip-extension power, but be careful with knees. |
| <b>Wednesday</b> | Endurance training (swim, bike, other) or day off.  |
| <b>Thursday</b>  | CompuTrainer: Work on pedaling technique with SpinScan. Try Isolated Leg Training, Spin Step Ups, or Form Sprints.  |
| <b>Friday</b>    | Same as Monday.   |
| <b>Saturday</b>  | Same as Tuesday.  |
| <b>Sunday</b>    | Same as Wednesday.  |

## ***Build Period - Short Distance (January-March and July)***

The Build period gradually increases the volume of the intense workouts. Workout duration, which should have peaked during Base 2, are maintained at a high level. Since the intensity of swim and run workouts are also increasing during this period, there should be only one or two high quality bike workouts per week. Be cautious with your recovery and rest during this period so that you don't overtrain. Better undertrained and eager than overtrained and unmotivated.

While this period is designed around three bike workouts weekly, the experienced athlete may complete two-a-day workouts several times a week. Duathletes may also include one or two more bike workouts. Additional bike courses, or in the Stand Alone Mode .

### ***Build 1 (January)***

In this block, the intensity of strength workouts is reduced while on-bike training becomes more intense. Hill training and the early stages of anaerobic threshold development for time trialing begin on the CompuTrainer.

#### **Build 1 (Short) - Triathlete/Duathlete (January)**

|                  |  |
|------------------|--|
| <b>Monday</b>    | Strength training or off.  |
| <b>Tuesday</b>   | CompuTrainer: Short Hill Repeats.  |
| <b>Wednesday</b> | Swim and/or run  |
| <b>Thursday</b>  | CompuTrainer: 45-90 minutes on a gently rolling course in 1-2 intensity zones. Stay seated on hills to build/maintain hip extension. |
| <b>Friday</b>    | Swim and/or run.   |
| <b>Saturday</b>  | CompuTrainer: In the middle of 90-minute to two-hour ride include Motorpaced Cruise Intervals.                                       |
| <b>Sunday</b>    | Swim and/or run.   |

### ***Build 2 (February)***

Aerobic capacity and power are further developed with longer hill repeats. Anaerobic threshold training becomes more race-like.



## **Build 2(Short) - Triathlete/Duathlete (February)**

|                  |  |
|------------------|--|
| <b>Monday</b>    | Off.   |
| <b>Tuesday</b>   | CompuTrainer: Long Hill Repeats.   |
| <b>Wednesday</b> | Swim and/or run.   |
| <b>Thursday</b>  | CompuTrainer: 45-90 minutes on a gently rolling course in 1-2 intensity zones. Stay seated on hills to build/maintain hip extension power. |
| <b>Friday</b>    | Strength training.   |
| <b>Saturday</b>  | CompuTrainer: In the middle of a 90-minute to two-hour ride include Motorpaced Tempo.  |
| <b>Sunday</b>    | Swim and/or run.   |

## ***Build 3 (March and July)***

Training becomes even more race-like during Build 3. Bike workouts become extended high efforts in the form of hilly rides and high intensity “bricks” - combined bike and run workouts. Return to this block in July for a two-peak season.

## **Build 3 (Short) (March and July)**

|                  |  |
|------------------|--|
| <b>Monday</b>    | Off.   |
| <b>Tuesday</b>   | CompuTrainer: Ride 60-90 minutes on a very hilly course staying in saddle on hills, but keeping cadence high (70+ rpm). Allow for warm-up, but ride aggressively in all intensity zones. |
| <b>Wednesday</b> | Swim and/or run.   |
| <b>Thursday</b>  | CompuTrainer: 45 minutes to two hours on a gently rolling course in 1-2 intensity zones. Stay seated on hills to build/maintain hip extension power.                                     |
| <b>Friday</b>    | Strength training.   |
| <b>Saturday</b>  | CompuTrainer: Every other week complete a Long Bike Brick or Short Bike Brick.   |
| <b>Sunday</b>    | Swim and/or run.   |

### ***Peak Period (Short) - Short Distance (April and August)***

The purpose of the Peak period is to prepare you for the stresses of racing. Volume is decreased while intensity increases. "Tune-up" races may be entered during this period. In August you may want to return to this period after completing the Build 3 block.

#### **Peak (Short) - Triathlete/Duathlete (April and August)**

|                  |   |
|------------------|---|
| <b>Monday</b>    | Off.  |
| <b>Tuesday</b>   | CompuTrainer: Work on your weakest area of the following: Long Hill Repeats, Motorpaced Cruise Intervals, or Progressive Intervals.   |
| <b>Wednesday</b> | Swim and/or run.  |
| <b>Thursday</b>  | CompuTrainer: Ride one hour on a flat course or in Stand Alone Mode in one intensity zone. Very easy spin.  |
| <b>Friday</b>    | Stength training AND/OR CompuTrainer: 45-90 minutes on a gently rolling course in 1-2 intensity zones. Stay seated on hills to build/maintain hip extension power.  |
| <b>Saturday</b>  | Tune-up race. OR, if racing tomorrow... CompuTrainer: Power Repeats. Complete one trip on course, out of saddle on hills. OR, if no races... CompuTrainer: Depending on your weaknesses, complete either a Long Bike Brick or Short Bike Brick. |
| <b>Sunday</b>    | Tune-up race. OR Swim and/or run.   |

### ***Race Period - Short Distance (May-June and September)***

You should feel very fit and ready to race well. Now is the time to maintain your greatest racing strength while being rested for races or simulations. Race or complete a simulation every other week.

## **Race (Short) - Triathlete/Duathlete (May-June and September)**

|                  |  |
|------------------|--|
| <b>Monday</b>    | Off.   |
| <b>Tuesday</b>   | CompuTrainer: Complete a short but intense workout focusing on your <i>strongest</i> area: Long Hill Repeats, Motorpaced Cruise Intervals, or Progressive Intervals.   |
| <b>Wednesday</b> | Swim and/or run.   |
| <b>Thursday</b>  | CompuTrainer: Ride one hour on a flat course or in Stand Alone Mode in one intensity zone. Very easy spin.   |
| <b>Friday</b>    | Strength training. AND/OR CompuTrainer: 45-90 minutes on a gently rolling course in 1-2 intensity zones. Stay seated on hills to build/maintain hip extension power.   |
| <b>Saturday</b>  | Race. OR, if racing tomorrow... Road: Ride 20-45 minutes. Set up bike for racing and complete 3x 30 seconds fast with 2-minute recoveries after each. OR, if not racing tomorrow... CompuTrainer: Complete a Race Simulation Brick. OR, if you raced or did simulation last week... CompuTrainer: Ride on a very hilly course in all intensity zones, staying in saddle on climbs. |
| <b>Sunday</b>    | Race. OR Swim and/or run.  |

## ***Recovery Period - Short Distance (October)***

Now is the time to get rested and recovered from the race season just completed. Spin on the CompuTrainer if you want to this month, but no “serious” training. Pursue other interests. Reflect on your strengths and weaknesses during the past season.

## ***Base Period - Long Distance***

The Base period is eight weeks and will improve your endurance, strength, and pedaling technique.

### ***Base 1***

Because long-distance endurance events require less power than short-distance events, this schedule places less emphasis on strength training and more on endurance.

#### **Base 1 (Long) -Triathlete/Duathlete**

|                  |  |
|------------------|--|
| <b>Monday</b>    | Strength training.   |
| <b>Tuesday</b>   | CompuTrainer: Ride 2-3 hours in 1-2 intensity zones on a course with rolling hills. Use the small chain ring with cadence at about 90rpm. Stay in the saddle on hills to build up hip power. |
| <b>Wednesday</b> | Off.   |
| <b>Thursday</b>  | Endurance train for 2-3 hours at very low effort. Can be running and/or swimming.  |
| <b>Friday</b>    | Strength training.   |
| <b>Saturday</b>  | Same as Tuesday.   |
| <b>Sunday</b>    | Same as Thursday.  |

### ***Base 2***

The object of this training block is to increase endurance while refining cycling economy - the ability to pedal without wasting energy. Strength training is maintained.

#### **Base 2 (Long) - Triathlete/Duathlete**

|                  |   |
|------------------|---|
| <b>Monday</b>    | Strength training.  |
| <b>Tuesday</b>   | CompuTrainer and road: Ride 2-4 hours on a course with rolling hills, staying in the 1-3 zones. Use both small and big chain rings with cadence at about 90rpm. Stay in saddle on most hills to build greater hip extension power, but be careful with knees. |
| <b>Wednesday</b> | Endurance training (swim, bike, other) or day off.  |
| <b>Thursday</b>  | CompuTrainer: Work on pedaling technique with SpinScan. See Isolated Leg Training, Spin Step Ups, and Form Sprints.   |
| <b>Friday</b>    | Strength training.  |
| <b>Saturday</b>  | Same as Tuesday.  |
| <b>Sunday</b>    | Same as Wednesday   |

## ***Build Period - Long Distance***

The Build period also includes hill training, especially on courses that have long, steady climbs, to improve anaerobic threshold speed. Anaerobic threshold speed improvement also comes from cruise intervals and tempo workouts in later blocks. Bricks (combined bike-run workouts) become the focus of training late in the Build period to prepare the multisporter for the stresses of racing.

A minimum of three bike workouts are necessary to prepare for long-distance triathlons and duathlons. If you have trained at high volumes before and your life-style allows it, you may want to add one or two more bike workouts weekly. Duathletes may also want to complete one or two more weekly rides. Additional bike workouts should be one to two hours in duration in the 1-2 intensity zones on flat courses, or in the Stand Alone Mode.

### ***Build 1***

In this block, the intensity of strength workouts is reduced or eliminated altogether if this is not a weak area. On-bike training becomes more intense including hill training and the early stages of anaerobic threshold speed development.

#### **Base 1 (Long) - Triathlete/Duathlete**

|                  |   |
|------------------|---|
| <b>Monday</b>    | Strength training or off.   |
| <b>Tuesday</b>   | CompuTrainer: Long Hill Repeats.  |
| <b>Wednesday</b> | Swim and/or run. Thursday CompuTrainer: Ride 90 minutes to 2 hours on a gently rolling course in 1-2 zones. Stay seated on hills to build/maintain hip extension power. (May also do quality run.)  |
| <b>Friday</b>    | Swim and/or run.  |
| <b>Saturday</b>  | CompuTrainer and/or road: Ride 2-5 hours on a rolling course in the 1-4 zones, primarily. Avoid going into the 5 zone. Stay in saddle on many of the hills to build/maintain hip extension power. Hold aero position for most of the ride. If position is too uncomfortable to maintain, adjust bike setup. |
| <b>Sunday</b>    | Swim and/or run.  |

## ***Build 2***

Training becomes more race-like in this period as anaerobic threshold speed training is added in the form of cruise intervals. Strength training is further reduced. Long bike rides build to the greatest duration of the buildup.

### **Build 2 (Long) - Triathlete/Duathlete**

|                  |  |
|------------------|--|
| <b>Monday</b>    | Off.   |
| <b>Tuesday</b>   | CompuTrainer: Motorpaced Cruise Intervals.   |
| <b>Wednesday</b> | Swim and/or run.   |
| <b>Thursday</b>  | CompuTrainer: Ride 90 minutes to 2 hours on a gently rolling course in 1-2 zones. Stay seated on hills to build/maintain hip extension power. (May also do quality run.)   |
| <b>Friday</b>    | Strength training.   |
| <b>Saturday</b>  | CompuTrainer and/or road: Ride 3-6 hours on a rolling course. Stay in saddle on many of the hills to build/maintain hip extension power. Assume aero position for most of the ride. If position is too uncomfortable to maintain, adjust bike setup. |
| <b>Sunday</b>    | Swim and/or run.   |

## ***Build 3***

In the last of the Build blocks, training begins to take on more of the unique requirements of the long-distance race. Tempo training maintains anaerobic threshold speed and the concentration of multi-hour time trials, while bricks are added to prepare the athlete for the exact requirements of the race.

During this block, the athlete should race once or twice at distances shorter than the goal event. Taper the week of the race by greatly reducing the volume.

### **Build 3 (Long) - Triathlete/Duathlete**

|                  |   |
|------------------|---|
| <b>Monday</b>    | Off.  |
| <b>Tuesday</b>   | CompuTrainer and/or road: Warm up and then ride 1/4 to 1/3 of goal-race distance in Motorpaced Tempo workout.   |
| <b>Wednesday</b> | Swim and/or run.  |
| <b>Thursday</b>  | CompuTrainer: Ride 45-90 minutes to 2 hours on a gently rolling course in 1 zone. This workout must be very easy to allow body to recover for the weekend brick run.  |
| <b>Friday</b>    | Strength training.  |
| <b>Saturday</b>  | CompuTrainer and/or road: Every other week, complete either a Long Bike Brick or Short Bike Brick, depending on your weakness, or complete a Race Simulation Brick. The first Race Simulation Brick should be shorter . |
| <b>Sunday</b>    | Swim open water at a steady effort.   |

### ***Peak Period - Long Distance***

This period lasts only three weeks and represents the final tune-up before the goal race. The last Race Simulation Brick should be completed three weeks before the goal race. Following that brick, all subsequent workouts are meant to maintain fitness and peak you for race day. Recovery is the most important aspect of this period. Reduce training volume by 20% of the previous week's volume during each of the last three weeks before the race.

### **Peak (Long) - Triathlete/Duathlete**

|                  |  |
|------------------|--|
| <b>Monday</b>    | Off.   |
| <b>Tuesday</b>   | CompuTrainer: Work on the area that best prepares you for the unique requirements of the event for which you are preparing. Flat course (Motorpaced Cruise Intervals), rolling hills (Long Hill Repeats), or long hills (Long Climbs). |
| <b>Wednesday</b> | Swim and/or run.   |
| <b>Thursday</b>  | CompuTrainer: Ride one hour on a flat course or in Stand Alone Mode in one intensity zone. Very easy spin. (May also do quality run.)  |
| <b>Friday</b>    | CompuTrainer: Ride 45-90 minutes on a gently rolling course in 1-2 zones. Stay seated on hills to build/maintain hip extension power.  |
| <b>Saturday</b>  | CompuTrainer and/or road: Warm-up and then ride 1/5 of goal-race distance in Motorpaced Tempo.   |
| <b>Sunday</b>    | Swim and or run.   |

## ***Race Week - Long Distance***

The purposes of race week training are to rest the slow twitch/endurance muscles while maintaining the function of the fast twitch/power muscles, boost or maintain blood volume, and store energy in the muscles by carbohydrate loading during the last three days.

### **Race Week (Long) - Triathlete/Duathlete**

|                  |   |
|------------------|---|
| <b>Monday</b>    | Off.  |
| <b>Tuesday</b>   | CompuTrainer: Short Hill Repeats with four repeats on the course. |
| <b>Wednesday</b> | Swim and/or run.  |
| <b>Thursday</b>  | CompuTrainer: Short Hill Repeats with two repeats on the course.  |
| <b>Friday</b>    | Off.  |
| <b>Saturday</b>  | Race.   |
| <b>Sunday</b>    | Off.  |



# Century Riders

Five or more hours of nearly continuous pedaling over a variety of terrain is a challenge more and more cyclists are taking up. The century requires great endurance and, depending on the course, climbing power.

This section is divided into two schedules - "*Goal: Finish*" for people who only want to complete a century, and "*Goal: Time*" for riders who have a completion time, such as five hours, in mind. Don't set time goals if you've never done a century. No one realizes how difficult finishing is until it's accomplished.

Each schedule includes three types of workouts - easy, pace, and brisk. **Easy** rides are for recovery and should be at a leisurely effort. Ride your CompuTrainer on a flat course, in the Stand Alone mode with light resistance, or in the SpinScan mode balancing your power output.

**Pace** workouts are done with the same speed/effort you anticipate maintaining in the century. One of these is your weekly long ride, the one that builds to near-century distance. Early in your training you may do these on CompuTrainer, but as the distances get longer riding on the road is recommended. You will probably want to do longer road rides with a partner taking turns breaking the wind, just as you will do in the century. CompuTrainer is perfect for shorter pace workouts. Do these on courses similar to the century with the draft turned "on." Take turns "pulling" with the Pacer. Control the Pacer's speed with the "+" and "-" buttons on the handlebar module.

**Brisk** rides are either faster or on steeper terrain than pace workouts. The purpose is to improve your aerobic strength making the century all that much easier. Other than riding CompuTrainer's standard courses such as the Morgul Bismark, "*Goal: Time*" schedule followers should also use workouts Progressive Intervals , Long Hill Repeats, Motorpaced Tempo, and Long Climbs.

All riding times on both schedules are in hours with total weekly time in the last column. Notice that weekly time builds in three-week blocks with the next week being a light training week. The "*Goal: Time*" schedule has steeper increases and decreases of weekly volume than the "*Goal: Finish*" schedule due to the greater trainer stress of the former. Do not increase the volume of the recovery weeks.

Starting three days before the century (on Thursday for a Sunday event), increase carbohydrate in your diet while decreasing fat and protein. This will "load" your muscles with extra energy. Good sources of carbohydrates at this time are pasta, bread, fruit, vegetables, juices, and energy bars. Also get in plenty of energy on the bike from easily digestible carbohydrates in both solid and liquid forms. Be sure to practice eating and drinking just as you will do in the century on all of your long rides .

**Goal: Finish**

| Week | Mon | Tue  | Wed     | Thu   | Fri | Sat  | Sun     | Time |
|------|-----|------|---------|-------|-----|------|---------|------|
|      | Off | Pace | Pace    | Brisk | Off | Easy | Pace    |      |
| 1    | Off | :30  | :45     | :30   | Off | :30  | 1:00    | 3:15 |
| 2    | Off | :45  | :45     | :30   | Off | :30  | 1:30    | 4:00 |
| 3    | Off | :45  | :45     | :45   | Off | :30  | 2:00    | 4:45 |
| 4    | Off | :30  | :45     | :30   | Off | :30  | 1:00    | 3:15 |
| 5    | Off | :45  | 1:00    | :45   | Off | :45  | 2:30    | 5:45 |
| 6    | Off | 1:00 | 1:00    | :45   | Off | :45  | 3:00    | 6:30 |
| 7    | Off | 1:00 | 1:00    | 1:00  | Off | :45  | 3:30    | 7:15 |
| 8    | Off | :30  | :45     | :30   | Off | :30  | 2:00    | 4:15 |
| 9    | Off | 1:00 | 1:00    | 1:00  | Off | :45  | 4:00    | 7:45 |
| 10   | Off | 1:00 | 1:30    | 1:00  | Off | :45  | 4:30    | 8:45 |
| 11   | Off | 1:00 | :45     | 1:00  | Off | :30  | 2:00    | 5:15 |
| 12   | Off | :45  | :30/Off | :30   | Off | :20  | CENTURY |      |

**Goal: Time**

| Week | Mon | Tue  | Wed   | Thu  | Fri   | Sat  | Sun     | Time  |
|------|-----|------|-------|------|-------|------|---------|-------|
|      | Off | Pace | Brisk | Easy | Brisk | Easy | Pace    |       |
| 1    | Off | 1:00 | :45   | :45  | :45   | :45  | 1:00    | 5:00  |
| 2    | Off | 1:00 | 1:00  | 1:00 | :45   | 1:00 | 1:30    | 6:15  |
| 3    | Off | 1:30 | 1:00  | 1:00 | 1:00  | 1:00 | 2:00    | 7:30  |
| 4    | Off | :45  | :45   | Off  | :45   | :45  | 1:00    | 4:00  |
| 5    | Off | :45  | :45   | :45  | :45   | :45  | 2:30    | 6:15  |
| 6    | Off | 1:00 | 1:00  | :45  | 1:00  | :45  | 3:00    | 7:30  |
| 7    | Off | 1:30 | 1:00  | 1:00 | 1:00  | 1:00 | 3:30    | 9:00  |
| 8    | Off | :45  | :45   | off  | :45   | :45  | 2:00    | 5:00  |
| 9    | Off | 1:00 | 1:00  | :45  | 1:00  | :45  | 4:00    | 8:30  |
| 10   | Off | 1:30 | 1:30  | :45  | 1:00  | :45  | 4:30    | 10:00 |
| 11   | Off | 1:00 | 1:00  | Off  | 1:00  | 1:00 | 2:00    | 6:00  |
| 12   | Off | 1:00 | :45   | :45  | Off   | :30  | CENTURY |       |

# Fitness

Cycling is one of the best aerobic activities for those wanting to improve general fitness, reduce body fat, and lower the risk of heart disease and other causes of premature death. There is no jarring of muscles, tendons, or joints so the possibility of an exercise-stopping injury is reduced while effort can be easily maintained in the target heart rate range.

Fitness workouts in this section emphasize “aerobic” exercise - lower intensity activities that do not cause the accumulation of lactic acid and use fat primarily for fuel.

Improving basic aerobic fitness involves carefully increasing your weekly time in the target heart rate range. Workouts are divided into two types - **easy** using only the 1 intensity zone (see Workout Heart Rates for determining heart rate ranges), and **brisk** taking you into the 2 to 4 zones. Notice that the 5 zone is avoided in all workouts in this section. Easy workouts are done either on a flat to gently rolling course, or in the Stand Alone or SpinScan modes with a lower resistance setting. Brisk rides are on hilly courses or with higher settings in the Stand Alone or SpinScan modes.

Maintaining a cadence of at least 80rpm is important. Grinding away at a low cadence places undue stress on your knees. Until you become comfortable with higher spin rates, you should frequently monitor your cadence.

Following are three 12-week schedules: “*Novice*” for those who are just starting a fitness program, “*Intermediate*” for the more experienced, and “*Advanced*” for long-time exercisers. You may start at any point on any of these schedules based on your current level of fitness. If you’re beyond the *Advanced* schedule, you may consider the Century program at the beginning of this section or a racing schedule.

All entries on these schedules are in hours and minutes.

## Novice

| Week | Mon | Tue  | Wed   | Thu | Fri  | Sat      | Sun  | Time |
|------|-----|------|-------|-----|------|----------|------|------|
|      | Off | Easy | Brisk | Off | Easy | Easy/Off | Easy |      |
| 1    | Off | :30  | :30   | Off | :45  | Off      | :45  | 2:30 |
| 2    | Off | :45  | :30   | Off | :45  | Off      | :45  | 2:45 |
| 3    | Off | :45  | :30   | Off | :45  | Off      | 1:00 | 3:00 |
| 4    | Off | :30  | :30   | Off | :30  | Off      | :45  | 2:15 |
| 5    | Off | :45  | :30   | Off | :45  | Off      | 1:00 | 3:00 |
| 6    | Off | :45  | :45   | Off | :45  | Off      | 1:15 | 3:30 |
| 7    | Off | :45  | :45   | Off | :45  | Off      | 1:15 | 3:30 |
| 8    | Off | :30  | :30   | Off | :45  | Off      | :45  | 2:30 |
| 9    | Off | :45  | :30   | Off | :45  | :30      | 1:00 | 3:30 |
| 10   | Off | :45  | :30   | Off | :45  | :30      | 1:15 | 3:45 |
| 11   | Off | :45  | :30   | Off | :45  | :30      | 1:30 | 4:00 |
| 12   | Off | :45  | :30   | Off | :45  | Off      | :45  | 2:45 |

## Intermediate

| Week | Mon | Tue  | Wed   | Thu | Fri  | Sat   | Sun  | Time |
|------|-----|------|-------|-----|------|-------|------|------|
|      | Off | Easy | Brisk | Off | Easy | Brisk | Easy |      |
| 1    | Off | :45  | :45   | Off | :45  | :45   | 1:00 | 4:00 |
| 2    | Off | 1:00 | :45   | Off | :45  | :45   | 1:15 | 4:30 |
| 3    | Off | 1:00 | :45   | Off | 1:00 | :45   | 1:30 | 5:00 |
| 4    | Off | :45  | :45   | Off | :45  | :45   | 1:00 | 4:00 |
| 5    | Off | 1:00 | :45   | Off | :45  | :45   | 1:15 | 4:30 |
| 6    | Off | 1:00 | :45   | Off | 1:00 | :45   | 1:30 | 5:00 |
| 7    | Off | 1:00 | 1:00  | Off | 1:00 | 1:00  | 1:30 | 5:30 |
| 8    | Off | 1:00 | :45   | Off | :45  | :45   | 1:15 | 4:30 |
| 9    | Off | 1:00 | :45   | Off | 1:00 | :45   | 1:30 | 5:00 |
| 10   | Off | 1:00 | 1:00  | Off | 1:00 | 1:00  | 1:30 | 5:30 |
| 11   | Off | 1:00 | 1:00  | Off | 1:00 | 1:00  | 2:00 | 6:00 |
| 12   | Off | 1:00 | :45   | Off | 1:00 | :45   | 1:30 | 5:00 |

## Advanced

| Week | Mon | Tue  | Wed   | Thu      | Fri  | Sat   | Sun  | Time |
|------|-----|------|-------|----------|------|-------|------|------|
|      | Off | Easy | Brisk | Easy/Off | Easy | Brisk | Easy |      |
| 1    | Off | 1:00 | 1:00  | Off      | 1:00 | 1:00  | 1:30 | 5:30 |
| 2    | Off | 1:15 | 1:00  | Off      | 1:00 | 1:00  | 2:00 | 6:15 |
| 3    | Off | 1:15 | 1:00  | :45      | 1:00 | 1:00  | 2:00 | 7:00 |
| 4    | Off | 1:00 | 1:00  | Off      | 1:00 | 1:00  | 1:30 | 5:30 |
| 5    | Off | 1:00 | 1:00  | Off      | 1:00 | 1:00  | 2:00 | 6:00 |
| 6    | Off | 1:00 | 1:00  | :45      | 1:00 | 1:00  | 2:00 | 6:45 |
| 7    | Off | 1:15 | 1:00  | 1:00     | 1:15 | 1:00  | 2:00 | 7:30 |
| 8    | Off | 1:00 | 1:00  | Off      | 1:00 | 1:00  | 2:00 | 6:00 |
| 9    | Off | 1:15 | 1:00  | Off      | 1:15 | 1:00  | 2:00 | 6:00 |
| 10   | Off | 1:15 | 1:00  | 1:00     | 1:00 | 1:00  | 2:00 | 7:15 |
| 11   | Off | 1:30 | 1:00  | 1:15     | 1:15 | 1:00  | 2:00 | 8:00 |
| 12   | Off | 1:15 | 1:00  | Off      | 1:15 | 1:00  | 2:00 | 6:30 |

# Calibration

The key to testing is calibration of your CompuTrainer. To measure your training progress, you must compare your present condition with previous levels. To do this accurately, the equipment must be correctly calibrated to ensure the conditions for each test are as similar as possible. This procedure should also be done before all workouts so that the results are meaningful.

The Handlebar Controller calibration software was introduced by RacerMate in 1994. If you do not have this feature, contact RacerMate (the company) at 1-800-522-3610 and purchase it. You can install the chip yourself with the instructions they provide, and you'll find the modest cost makes your CompuTrainer even more valuable to your training.

## ***Calibration Procedure***

**Use the CompuTrainer in the Stand-Alone Mode (the stereo cable NOT connected to the EXT PC jack for the computer or Nintendo unit).**

**Ride for five minutes to warm up the tire and equipment.**

**Enter the calibration mode by pressing the “+” and “-” keys simultaneously. The screen will show the letter “U” in the lower left corner and the number “200” in the lower center. The number “00.00mph” appears at the top of the screen.**

**Begin pedaling. The word “UP” appears on the right of the screen. Speed up to 25mph. Stop pedaling and allow the wheel to coast to a stop. When the wheel stops, the measured rolling resistance will appear at the top of the screen. Save this number by pressing F3 (“Set”). Repeat this two more times to ensure accuracy. Calibration is now complete.**

**Press the “Reset” key to return to the Ergometer Operating Mode. You may stay in the Stand Alone Mode or insert the stereo cable into the Handlebar Controller jack.**

**Begin your workout or test.**

# Anaerobic Threshold Test

Following are two tests for determining anaerobic threshold. The first uses the PC or TV display while the second works in the Stand Alone Mode.

**Purpose:** The purpose of the Conconi Test is to find your anaerobic threshold (AT) heart rate. You will need the heart rate monitor sensor and an assistant.

## **Anaerobic Threshold Test using PC or TV display**

### **CompuTrainer setup:**

- **Calibrate the CompuTrainer.**
- **Connect the Handlebar Controller** to the PC or TV with the stereo cable in the EXT PC jack.
- **PC Course:** Create a flat course 10 miles in distance.
- **NES Program:** Create a flat course 10 miles in distance.
- **Race Against:** Pacer
- **Your Weight:** (Actual weight.)
- **Target Heart Rate:** (N/A)
- **Drafting:** OFF

### **Test:**

Warm up 10-15 minutes gradually raising the intensity.

Select a gear that you would use to time trial on a flat course with no wind, such as 53 X 14 or 15. You will stay in this gear the entire test. It must be a hard enough gear so that you don't "spin-out" at high speed.

Start the test at 12 to 16 mph in your selected gear. Your cadence will be low. Every minute increase your speed by 0.5 mph without shifting by increasing your cadence. Do this until you can no longer continue to increase speed. Stay seated - do not get out of saddle throughout the test. At the end of every minute your assistant records your pulse, speed, and perceived exertion. Use the following perceived exertion guide:

- 7 Very, very light
- 8
- 9 Very light
- 10
- 11 Fairly light
- 12
- 13 Somewhat hard
- 14
- 15 Hard
- 16
- 17 Very hard
- 18
- 19 Very, very hard
- 20

Your assistant should also listen to your breathing to detect when it first becomes labored. Typically, AT heart rate occurs at the same time as the ventilatory threshold (VT). The assistant should mark the heart rate at this point on the data-keeping sheet as a reference point. The data will look like this:

| <b>Speed</b> | <b>Pulse</b> | <b>Perception</b> |
|--------------|--------------|-------------------|
| 16.0         | 110          | 9                 |
| 16.5         | 118          | 11                |
| 17.0         | 125          | 12                |
| 17.5         | 135          | 13                |
| 18.0         | 142          | 14                |
| 18.5         | 147          | 15                |
| 19.0         | 153          | 17 "VT"           |
| 19.5         | 156          | 19                |

Create an "XY" graph with the vertical coordinate representing heart rate and the horizontal speed cubed.

Plot the data points from the test onto the chart and connect them. The point at which the line deflects or bends sharply is assumed to be AT heart rate. Confirm this by comparing it with the VT heart rate and perceived exertion of 16 or 17. Another way of confirming it is that most riders can usually only achieve three to five points beyond their AT. Be aware that many people don't have a deflection point. If you're in this group, assume that VT pulse matched by 16 to 17 perception is your AT heart rate.

## ***Anaerobic Threshold Test in Stand Alone Mode***

### ***CompuTrainer setup:***

Calibrate the CompuTrainer.

Disconnect the Handlebar Controller from the Nintendo unit by removing stereo cable from the EXT PC jack.

### ***Test:***

Warm up 10-15 minutes gradually raising the intensity.

Select a gear that you would use to time trial up a gradual hill, such as 53 X 15 or 16. Write this gear down for future reference. You will stay in it the entire test and in subsequent retests.

Start the test at 18mph in your selected gear with watts set for 50. Every minute, your assistant will increase the watts by 20 by pressing the “+” key twice. You will stay in the same gear and attempt to maintain 18mph. Do this until you can no longer continue to maintain 18mph. Stay seated - do not get out or saddle throughout test. At the end of every minute, your assistant records your heart rate, watts, and perceived exertion. Use the following perceived exertion guide:

- 7 Very, very light
- 8
- 9 Very light
- 10
- 11 Fairly light
- 12
- 13 Somewhat hard
- 14
- 15 Hard
- 16
- 17 Very hard
- 18
- 19 Very, very hard
- 20



Your assistant should also listen to your breathing to detect when it first becomes labored. Typically, AT heart rate occurs at the same time as the ventilatory threshold (VT). The assistant should mark the heart rate at this point on the data-keeping sheet as a reference point. The data will look like this:

| <b>Watts</b> | <b>Heart Rate</b> | <b>Perception</b> |
|--------------|-------------------|-------------------|
| 50           | 110               | 9                 |
| 70           | 118               | 11                |
| 90           | 125               | 12                |
| 110          | 135               | 13                |
| 130          | 142               | 14                |
| 150          | 147               | 15                |
| 170          | 153               | 17 "VT"           |
| 190          | 156               | 19                |

Create an "XY" graph with the vertical coordinate representing heart rate and the horizontal representing watts.

Plot the data points from the test onto the chart and connect them. The point at which the line deflects or bends sharply is assumed to be AT heart rate. Confirm this by comparing it with the VT heart rate and perceived exertion of 16 or 17. Another way of confirming is it that most riders can usually only achieve three to five data points beyond their AT. Be aware that many people don't have a deflection point. If you're in this group, assume that VT pulse matched by 16 or 17 perception is your AT heart rate.

# Power Test

**Purpose:** This test will serve as a baseline for measuring your power on the bike. Power is directly related to climbing ability and sprinting, although other variables such as weight, economy of movement, and technique also play a role.

## **CompuTrainer setup:**

- Calibrate and insert stereo jack into the handlebar control module.
- **NES Program: Create** a flat course 0.2 miles in distance
- **Race Against: Pacer**
- **Your Weight: (actual weight)**
- **Drafting: OFF**
- **Set a fan at face level**

## **Workout:**

- Warm up for 10-15 minutes gradually increasing effort.
- The test is started from a standing start with the rear wheel stopped. “Press-on force” must be high to prevent slipping. Take three or four practice starts to check this and to select the proper gear for your start. If you adjust press-on force, recalibrate.
- During the test, you may stand or sit and shift gears at any time. If you’re a large or powerful rider, you may want a spotter on either side of the bike in case you begin to tip over. You can also bolt your CompuTrainer to a sheet of plywood to prevent tipping.
- When ready to start the test, stop your rear wheel and have an assistant press “F1”. At the sound of the gun, sprint the 0.2 mile course as fast as you can. It will probably take you 25 to 40 seconds. Recover by spinning in a light gear for several minutes.
- Early in the test, your assistant should carefully watch “Watts” on the TV monitor for your maximum power output.
- Record your maximum watts and average (“AVG”) watts. Maximum is a good indicator of your ultimate power level. Average watts tells you how good your power-endurance is. This test should be repeated every six to eight weeks to measure progress in both of these areas.

# Aerobic Time Trial

Following are two tests for measuring the progress of your anaerobic fitness. The first is for owners of CompuTrainers which do *not* have ergometer/calibration software; the second is for units that do.

## **CompuTrainer setup:**

- **Calibrate the CompuTrainer**
- **NES Program:** Create a flat course 5 miles in distance
- **Race Against:** Pacer
- **Your Weight:** (Actual weight)
- **Target Heart Rate:** 1 beat per minute either side of selected value (see below)
- **Drafting:** OFF
- **Set fan at face level**

## **Workout:**

- **Warm up 15-20 minutes steadily elevating your pulse.**
- **Determine the ATT test rate by subtracting 20 from your anaerobic threshold pulse (see Anaerobic Threshold Test). Remember - this is an *aerobic* time trial. It is to be performed at a moderate effort. Play with your gears to find one that allows you to maintain this pulse with a comfortable cadence.**
- **In the test gear, elevate your heart rate to the range of test heart rate. When you have achieved the heart rate zone, press “F1” to start the program. Be careful not to drift outside of the heart rate limits for the entire 5 miles. Do not shift during the test. Remain seated.**
- **In your journal, record the gear used, the test heart rate, and your five-mile time.**
- **Repeat the ATT every four to six weeks to determine progress. Don’t expect big changes. A 30 second improvement in four weeks is quite an impressive change.**

# Ramp

The Ramp is a procedure developed by Joe Beer, a triathlon coach from Bath, England. It can play a significant role in all aspects of your training if done frequently. I've found that conducting the Ramp once or twice weekly throughout the season keeps the athlete in control of their training progress by eliminating guesswork as to current fitness and fatigue levels.

Watching for overtraining, although important, can be quite difficult for the serious athlete. While subjective measures of overtraining are seldom trusted by athletes as valid indicators, the heart never lies. Using it with the CompuTrainer is an accurate and reliable way of determining overtraining. The most valid indicator of "staleness" is performance - if performance declines despite adequate and consistent training, overtraining is imminent.

**Purpose:** The purposes of the Ramp are to quickly check aerobic progress, determine if extreme fatigue or overtraining is happening, measure recuperation from overtraining, and to warm up before intense workouts.

## **CompuTrainer setup:**

Calibrate.

Disconnect the stereo jack from the handlebar control unit so that you use the Stand Alone Mode only during the Ramp. Connect the heart rate monitor jack to the handlebar control unit.

## **Test:**

Determine wattage resistance levels to be used in the four stages of the test. Most athletes find that stages of 50, 100, 150, and 200 watts are about right. You may need to experiment to find personal power settings that will keep you at least 10 beats per minute below your anaerobic threshold pulse at the highest stage. Select a gear similar to what you warm up in. Stay in this gear throughout the test.

Maintain a speed of 16mph in the stage 1 wattage setting for three minutes. Without stopping, record your stage 1 heart rate at three minutes and increase the wattage resistance to the second stage. Repeat the procedure through all four stages. Then stop pedaling for one minute to measure your recovery pulse. At the end of the recovery minute, record your pulse. The test is complete.

You will now have five heart rates recorded. Add them to find your current Ramp Total. The data will look like this:

| Stage | Watts      | Heart Rate |
|-------|------------|------------|
| 1     | 50         | 91         |
| 2     | 100        | 102        |
| 3     | 150        | 124        |
| 4     | 200        | 138        |
| 5     | (Recovery) | 88         |

Ramp- Total= 543

Record your Ramp Total for comparison with future tests.

## Personal Progress Log

## Anaerobic Threshold Test

| Date | Test Gear | AT Pulse | AT Speed Power |
|------|-----------|----------|----------------|
|      |           |          |                |
|      |           |          |                |
|      |           |          |                |

| Date | Test Gear | AT Pulse | AT Speed Power |
|------|-----------|----------|----------------|
|      |           |          |                |
|      |           |          |                |
|      |           |          |                |

## Power Test

| Date | Max Power | Avg Power |
|------|-----------|-----------|
|      |           |           |
|      |           |           |
|      |           |           |

| Date | Max Power | Avg Power |
|------|-----------|-----------|
|      |           |           |
|      |           |           |
|      |           |           |

## Aerobic Time Trial

[illegible][illegible]

## Ramp

[illegible][illegible]

# Isolated Leg Training

**Purpose:** The purposes of this workout are to teach your legs to make smooth circles and to balance left and right leg power output at high cadence.

## **CompuTrainer set-up:**

- Program: SpinScan mode
- Place a chair, stool, or box on either side of your bike.
- Set a fan head-on at face level.

## **Workout:**

Starting in your small chain ring, warm up 10-15 minutes keeping your cadence at 85 rpm or higher. Observe your left-right power split striving to balance them at 50-50.

- Place your right foot on the chair leaving your other foot in the pedal. Pedal with just the left foot attempting to balance the stroke so that your leg is making a smooth circle. Select a gear which allows just slight resistance and in which you can hold 85+ rpm.
- Alternate between right and left legs spinning for 30-60 seconds on each before changing. After two or three spins for each leg, return to two-legged spinning for a minute or so and observe your left-right power balance before repeating the ILT drill .
- The ILT drill can be done several times as a workout in itself, or can be used as a warm-up and cool-down activity.
- Cool down and stretch the quads, hamstrings, and gluteus.

# Spin Set Ups

**Purpose:** The purposes of this workout are to teach your legs to make smooth circles and to balance left and right leg power output at high cadence.

## **CompuTrainer set-up:**

- **Program:** SpinScan mode
- **Set a fan head-on at face level**

## **Workout:**

- Using your small chain ring, warm up 10-15 minutes keeping your cadence at 90 rpm. Observe your left-right power split striving to balance them at 50-50.
- Then, without stopping, increase your cadence to 100 rpm for five minutes. Monitor your left-right power split striving to balance them at 50-50.
- Step up your cadence to 110 rpm for three minutes. Again try to balance your left-right power split.
- Step up to 120+ rpm for one minute. Balance your left-right power split.
- Recover for five minutes and repeat one to two more times beginning with 100 rpm. The recovery spin at about 90 rpm should now feel much easier than during your warm-up.
- The step up drill can be done as a workout in itself or can be used as a warm-up and cool-down activity.
- Cool down and stretch the quads, hamstrings, and gluteus.

# Form Sprints

**Purpose:** This workout will improve your sprint technique and power by making you more efficient.

## CompuTrainer set-up:

- **Program:** SpinScan mode
- **Set a fan head-on at face level**

## Workout:

- Warm up 10-15 minutes, keeping your cadence at 85+ rpm. Observe your left-right power split striving to balance them at 50-50.
- Then select a gear such as 53 X 15 or easier and sprint out of the saddle for 10-15 seconds at maximum effort with a high cadence. Monitor your left-right power split striving to balance them at 50-50.
- Recover for about three minutes with an easy spin, observing and balancing leg power.
- Complete 10-15 such sprints. Stop sooner if your form becomes sloppy.
- The step up drill can be done as a workout in itself, or can be used as a warm-up and cool-down activity.
- Cool down and stretch the quads, hamstrings, and gluteus.

# Power Repeats

**Purpose:** Power is developed by improving both strength and the ability to move quickly under a load. While weight training builds raw strength, on-the-bike training is best for establishing velocity of movement.

- Cool down and stretch the quads, hamstrings, and gluteus.

## CompuTrainer set-up:

- **Course:** power\_repeats.crs or
- **NES Program:** Custom courses...*Set as follows...*
- **Race Against:** Pacer, Level
- **Your Weight:** (Actual Weight)
- **Target Heart Rate:** (N/A)
- **Drafting:** OFF
- Set a fan head-on at face level and warm up 15-20 minutes.

## Workout:

- In your big chain ring, staying in the saddle at all times, ride the course keeping cadence at 85-95 rpm regardless of whether you are going uphill or down. You will have to experiment to find the right gearing combination that allows this. use the biggest gear you can manage for 85-95 rpm. Your pulse and effort should rise dramatically on the uphill portions and fall on the downhill, but your cadence will not vary much.
- After the first 3-mile ride, recover for 3-5 minutes and repeat one to two more times. During four weeks, increase the number of trips you take over this course in a workout. You should soon find that you're getting stronger and able to use bigger gears. When you're eventually able to use your biggest gearing combination on this course, increase the grade of the uphill portions.

| Leg | Miles | Grade |
|-----|-------|-------|
| 1   | 0.4   | -5.0  |
| 2   | 0.1   | 2.0   |
| 3   | 0.4   | -5.0  |
| 4   | 0.1   | 2.0   |
| 5   | 0.4   | -5.0  |
| 6   | 0.1   | 2.0   |
| 7   | 0.4   | -5.0  |
| 8   | 0.1   | 2.0   |
| 9   | 0.4   | -5.0  |
| 10  | 0.1   | 2.0   |
| 11  | 0.4   | -5.0  |
| 12  | 0.1   | 2.0   |



# Descending Intervals

**Purpose:** This workout will boost your aerobic capacity and build greater leg and climbing power. Descending intervals are a stressful workout and should be approached with caution.

## CompuTrainer set-up:

- **PC Course:** descending\_intervals.crs or
- **NES Program:** Custom courses...*Set as follows:*

| Leg   | Miles | Grade |
|-------|-------|-------|
| 1     | 0.1   | 0.0   |
| 2     | 0.6   | 3.0   |
| 3     | 0.6   | -9.9  |
| 4     | 0.5   | 3.0   |
| 5     | 0.5   | -9.9  |
| 6     | 0.4   | 3.0   |
| 7     | 0.4   | -9.9  |
| 8     | 0.3   | 3.0   |
| 9     | 0.3   | -9.9  |
| 10    | 0.2   | 3.0   |
| 11    | 0.2   | -9.9  |
| 12    | 0.1   | 3.0   |
| 13    | 0.1   | -9.9  |
| Total | 4.3   |       |

- **Race Against:** Pacer, Level\_\_(n)\_\_\_
- **Your Weight:** (Actual Weight)
- **Target Heart Rate:** Min\_\_\_\_\_(lowest 5 zone)
- **Drafting:** Max\_\_\_\_\_(“Min” +10 beats)

## Workout:

- Warm up well, at least 15 minutes, before starting the intervals.
- Ride to the first hill and power to the top maintaining cadence at 70+ rpm. Combine both in and out of saddle on each hill.
- Spin easily down the other side so that you are only partially recovered before the next hill. On each hill, your intensity should become greater as the hills get shorter. Try using a bigger gear on each hill.
- Complete one to three trips over this course with 10-15 minutes of recovery between trips.
- If you feel weak or overextended during the first trip, stop the workout and just spin for a few minutes. This wasn't your day.
- Cool down and stretch the quads, hamstrings, and gluteus

# Motorpaced Intervals

**Purpose:** This workout will improve your aerobic capacity and power. This is a stressful workout and should be approached with caution.

## **CompuTrainer set-up:**

- **PC Course:** motor\_paced\_intervals.crs or
- **NES Program:** Road Race/Course...#70 Level Road 1 Mile
- **Race Against:** Pacer
- **Your Weight:** (Actual Weight)
- **Target Heart Rate:** Min \_\_\_\_\_ (lowest 5 zone); Max \_\_\_\_\_ ("Min" + 10 beats)
- **Drafting:** ON
- **Set fan at face level**

## **Workout:**

- Warm up well, at least fifteen minutes, before starting the motorpaced cruise intervals.
- Set the "Pacer Level" at something that is very challenging and that will take you into the 5 zone within one mile. For example, start at 600 watts and increase the Pacer's power by pressing the "+" control until you find a suitable level. After that, you should record in your log what the level was in order to repeat the workout. The next time, try to increase the Pacer to a slightly higher power.
- Stay in the 6- to 17-foot zone behind the pacer for most of each one-mile trip, but try to sprint around and pass several times.
- Recover for three minutes at the end of each mile section by spinning in a light gear. Get your pulse as low as possible as quickly as possible during each recovery. The short recovery will stress your aerobic system maximally improving your aerobic power.
- Complete 4-8 trips on the 1-mile course.
- If you find you feel lousy or overextended during the first repeat, start the second anyway. If during that repeat you don't start feeling better, or your pulse rises faster than normal, or you find it extremely difficult to get your heart rate up, call it quits.
- Cool down and stretch the quads, hamstrings, and gluteus.

# Progressive Intervals

**Purpose:** This workout will improve your anaerobic threshold, strength, general hill climbing ability, and concentration.

## **CompuTrainer set-up:**

- **PC Course:** progressive\_intervals.crs or
- **NES Program:** Road Race/Course...#76 Progressive Intervals
- **Race Against:** Pacer, Level \_\_\_\_\_
- **Your Weight:** (Actual Weight)
- **Target Heart Rate:** Min \_\_\_\_\_ (lowest 3 zone), Max \_\_\_\_\_ (lowest 5 zone + 10 beats)
- **Drafting:** Off
- **Set a fan head-on at face level**

## **Workout:**

- Warm up at least fifteen minutes before starting.
- The course's grade steadily rises for 6.8 miles with a 0.2-mile flat section between 0.4-mile sections that progressively get steeper until the last mile and a half when the course continues to rise, but at a decreasing rate. The steepest section near the top is 9.9% grade.
- Attempt to stay in the saddle all the way to the top being very respectful of your knees with judicious gear selection. Maintain cadence at 70 rpm or higher. Experiment with gears and positions on the saddle. Keep your fingers nimble on the bars - no death grips.
- Your pulse should vary from the 3 zone to five beats above anaerobic threshold, but generally rise throughout the climb.
- Beginning riders should complete no more than one trip over this course, while experienced riders may do two.
- In your journal, note the time of each climb and the gears used plus anything you may have learned about position, cadence, or mental focus.
- Cool down and stretch the quads, hamstrings, and gluteus.

# Crit Sprints

**Purpose:** This workout will improve your criterium racing by building power and the ability to recover after a sprint. Each short sprint is done at a high intensity to stress the neuromuscular system and is followed by a short, moderate effort rest interval to prevent full recovery, just as you experience in a criterium.

## **CompuTrainer set-up:**

- **PC Course:** crit\_sprints.crs or
- **NES Program:** Road Race/Course...#70 Level Road 3 Miles
- **Race Against:** Pacer, Level \_\_\_\_\_
- **Your Weight:** (Actual Weight)
- **Target Heart Rate:** Min \_\_\_\_\_ (lowest 2 zone); Max \_\_\_\_\_ (lowest 5 zone + 10 beats)
- **Drafting:** ON
- **Set a fan at face level**

## **Workout:**

- Warm up well, at least fifteen minutes, before starting the sprints portion of the workout.
- Set the “Pacer Level” at something that is moderately hard and will keep your pulse in the 1 zone.
- Start the first three-mile section by pressing “F1” and then allowing the Pacer to pull away so that you take up a draft position. Stay in the 6- to 17-foot zone behind the pacer until 0.4 miles. Then shift to a harder gear, get out of the saddle, and sprint to the 0.5-mile mark. Allow the Pacer to catch and pull ahead of you so that you settle back into a drafting position. Repeat your sprint at miles 0.9, 1.4, 1.9, 2.4, and 2.9. Keep your pulse above the lower limit after each sprint by adjusting the Pacer’s power with the “+” and “-” controls on your handlebar module.
- Fully recover for five to seven minutes after each three-mile section by spinning in a light gear. Do one to three trips over the course sprinting at each designated point.
- If you feel lousy or overextended during the first three-mile section, stop the workout.
- Cool down and stretch the quads, hamstrings, and gluteus.

# Hill Sprints

**Purpose:** This workout will improve your power and sprinting ability.

## CompuTrainer set-up:

- **PC Course:** hill\_sprints.crs or
- **NES Program:** Custom Courses...*Set as follows:*

| Leg | Miles | Grade |
|-----|-------|-------|
| 1   | 0.1   | 0.0   |
| 2   | 0.1   | 3.0   |
| 3   | 2.0   | -9.9  |
| 4   | 0.1   | 3.0   |
| 5   | 2.0   | -9.9  |
| 6   | 0.1   | 3.0   |
| 7   | 2.0   | -9.9  |

Total 6.4

- **Race Against:** Pacer, Level \_\_\_\_\_
- **Your Weight:** (Actual Weight)
- **Target Heart Rate:** N/A
- **Drafting:** OFF
- **Set a fan at face level**

## Workout:

- Warm up well, at least fifteen minutes, before starting the hill repeats.
- Ride to the first hill and at the bottom shift, stand, and sprint to the top maintaining cadence and power. Repeat this for the each of the next two hills.
- Spin easily down the other side so that you are fully recovered before the next hill.
- Complete two or three trips over this course with about eight minutes of recovery between trips. Try to increase the gear used for each subsequent trip.
- If you feel weak or overextended during the first trip, stop the workout and just spin for a few minutes. This wasn't your day.
- Cool down and stretch the quads, hamstrings, and gluteus

# Motorpaced Sprints

**Purpose:** This workout will improve your maximal sprint by building power, coordination, and leg speed. Each sprint is done at a high intensity to stress the neuromuscular system and is followed by a long and easy recovery interval to allow for complete recovery.

## **CompuTrainer set-up:**

- **PC Course:** motorpaced\_sprints.crs
- **NES Program:** Road Race/Course...#70 Level Road 3 Miles
- **Race Against:** Pacer, Level\_\_\_\_\_
- **Your Weight:** (Actual Weight)
- **Target Heart Rate:** Min\_\_\_\_\_(lowest 1 zone); Max\_\_\_\_\_(lowest 5 zone + 10 beats)
- **Drafting:** ON
- **Set a fan at face level**

## **Workout:**

- Warm up well, at least fifteen minutes, before starting the sprints portion of the workout.
- Set the "Pacer Level" at something that is relatively easy.
- Start the first set of sprints by pressing "F1" and then allowing the Pacer to pull away so that you take up a draft position. Stay in the 6- to 17-foot zone behind the pacer, riding easily, until 0.9 miles. Then shift to a harder gear, get out of the saddle, and sprint to the one-mile mark. Allow the Pacer to catch up and pull ahead of you so that you settle back into a drafting position. Repeat your sprint at miles 1.9 and 2.9. Get your pulse into the low 1 zone after each sprint by adjusting the Pacer's power with the "+" and "-" controls on your handlebar module.
- Fully recover for 7-10 minutes after each three-mile section by spinning in a light gear. Do no more than three repeats of the three-mile section.
- If you feel lousy or overextended during the first three-mile section, start the second anyway. If during that rep you don't start feeling better, or your pulse rises faster than normal, or you find it extremely difficult to turn a big gear quickly, stop the workout.
- Cool down and stretch the quads, hamstrings, and gluteus.

# Long Hill Repeats

**Purpose:** This workout will boost your aerobic capacity and build greater leg and climbing strength. Hill repeats is a stressful workout and should be approached with caution.

## CompuTrainer set-up:

- **PC Course:** long\_hill\_repeats.crs or
- **NES Program:** Custom Courses...Set as follows:

| Leg | Miles | Course |
|-----|-------|--------|
|-----|-------|--------|

|   |     |     |
|---|-----|-----|
| 1 | 0.1 | 0.0 |
|---|-----|-----|

|   |     |     |
|---|-----|-----|
| 2 | 0.7 | 5.0 |
|---|-----|-----|

|   |     |      |
|---|-----|------|
| 3 | 1.0 | -9.9 |
|---|-----|------|

|       |     |  |
|-------|-----|--|
| Total | 1.8 |  |
|-------|-----|--|

- **Race Against:** Pacer, Level \_\_\_\_\_
- **Your Weight:** (Actual Weight)
- **Target Heart Rate:** Min \_\_\_\_\_ (Lowest 5 zone); Max \_\_\_\_\_ ("Min" + 10 beats)
- **Drafting:** OFF
- **Set fan at face level**

## Workout:

- Warm up well, at least fifteen minutes, before starting the hill repeats.
- At the start of the 1.8-mile, course select a gear that will allow you to maintain at least 70 rpm while climbing in the saddle. This should be the biggest gear you can hold that cadence in. You may need to shift to an easier gear in subsequent attempts. Be cautious of your knees. If you have knee tenderness, select an easier gear that allows a high cadence or don't do this workout.
- While climbing, experiment with your position on the saddle and handlebar grip. Be careful not to "strangle" the handlebars.
- Time each of your hill repeats and try to maintain or improve the time on each attempt.
- Following the hill, there is a long recovery. Get your pulse down as quickly as you can by spinning and relaxing.
- Complete 3-5 trips over this course.
- If you feel weak or overextended during the first attempt, stop the workout and just spin for a few minutes. This wasn't your day.
- Cool down and stretch the quads, hamstrings, and gluteus.

# Motorpaced Tempo

**Purpose:** This workout will improve your ability to hold a moderately high effort for an extended period of time. It is a building block workout for a better time trial, a long pull in a small group, and the ability to bridge.

## **CompuTrainer set-up:**

- **PC Course:** motorpaced\_tempo.crs or
- **NES Program:** Road Race/Course...#70 Level Road 3 Miles
- **Race Against:** Pacer, Level\_\_\_\_\_
- **Your Weight:** (Actual Weight)
- **Target Heart Rate:** Min\_\_\_\_\_(lowest 3 zone value); Max\_\_\_\_\_(lowest 5 zone value+3 beats)
- **Drafting:** ON
- **Set fan at face level**

## **Workout:**

- Warm up well, at least fifteen minutes.
- Set the “Pacer Level” at something that is challenging and that will keep you in the zone. Start at a moderately high power setting and slowly increase the Pacer’s power by pressing “+” until you find the setting that keeps you in the zone. Record i n your log what the Pacer level was in order to repeat the workout. Every time you do this workout, try to increase the setting for the Pacer.
- The duration of the tempo ride should be 20-30 minutes, minimum. Set the “Road\_\_Miles” for a distance that will do this for you, such as 7 to 12 miles. Some training programs call for longer durations.
- As the motorpacing begins, stay in the 6- to 17-foot zone behind the pacer throughout. Experiment to find the cadence and gears which keep your pulse consistently the lowest yet still in the zone.
- If you feel lousy or overextended during the first five minutes, even though your pulse is staying in the zone, stop the workout.
- Cool down and stretch the quads, hamstrings, and gluteus.



# Motorpaced Cruise Intervals

**Purpose:** This workout will extend your ability to hold a moderately high effort for an extended period of time. It is a building block workout for better time trial, a long pull in a small group, and the ability to bridge.

## **CompuTrainer set-up:**

- **PC Course:** motorpaced\_cruise\_intervals or
- **NES Program:** Road Race/Course...#70 Level Road 3 Miles
- **Race Against:** Pacer, Level\_\_\_\_\_
- **Your Weight:** (Actual Weight)
- **Target Heart Rate:** Min \_\_\_\_\_(lowest 4 zone); Max \_\_\_\_\_(lowest 5 zone+3 beats)
- **Drafting:** ON
- **Set fan at face level**

## **Workout:**

- Warm up well, at least fifteen minutes, before starting the motorpaced cruise intervals.
- Set the “Pacer Level” at something that is challenging and that will keep you in the 4 zone. For example, start at 400 watts and increase the Pacer’s power by pressing the “+” control until you find a suitable level. After that, you should record in your log what the level was in order to repeat the workout. The next time, try to increase the Pacer to a slightly higher power.
- Stay in the 6- to 17-foot zone behind the pacer throughout each repeat. Experiment to find the cadence and gears which keep your pulse consistently the lowest. Keeping your pulse as low as possible despite a high effort workout is an art that must be learned and will pay dividends in races.
- Recover for two minutes at the end of each 3-mile section by spinning in a light gear. Get your pulse as low as possible as quickly as possible during each recovery. The short recovery will allow you to improve your anaerobic threshold within a 5-zone effort.
- Complete 2-4 trips on the 3-mile course.
- If you find you feel lousy or overextended during the first rep, start the second anyway. If during that rep you don’t start feeling better, or your pulse rises faster than normal, or you find it extremely difficult to get your heart rate up, call it quits.
- Cool down and stretch the quads, hamstrings, and gluteus.

# Short Hill Repeats

**Purpose:** This workout will boost your power and aerobic capacity. Hill repeats is a very stressful workout and should be approached with caution.

## CompuTrainer set-up:

- **PC Course:** short\_hill\_repeats or
- **NES Program:** Custom Courses...Set as follows:

| Leg | Miles | Grade |
|-----|-------|-------|
|-----|-------|-------|

|   |     |     |
|---|-----|-----|
| 1 | 0.1 | 0.0 |
|---|-----|-----|

|   |     |     |
|---|-----|-----|
| 2 | 0.3 | 8.0 |
|---|-----|-----|

|   |     |      |
|---|-----|------|
| 3 | 1.0 | -9.9 |
|---|-----|------|

TOTAL 1.4

- **Race Against:** Pacer, Level\_\_\_\_\_
- **Your Weight:** (Actual Weight)
- **Target Heart Rate:** Min\_\_\_\_\_(Lowest 5 zone); Max\_\_\_\_\_(“Min” +10 beats)
- **Drafting:** OFF
- **Set a fan at face level**

## Workout:

- Warm up well, at least fifteen minutes before starting hill repeats.
- At the start of the 1.4-mile course, select a gear that will allow you to maintain at least 70 rpm while climbing in the saddle. This should be the biggest gear you can hold that cadence in. You may need to shift to an easier gear in subsequent attempts. Be cautious of your knees. If you have knee tenderness, select an easier gear that allows a high cadence, or don't do this workout.
- When you start up the hill, stay in the saddle, maintaining a cadence of 70 rpm or more. At 0.3 miles into the course (0.1 from top), shift to a harder gear, stand on the pedals, and attack the hill all the way to the top.
- While climbing in the saddle, experiment with your position on the saddle and handlebar grip. Be careful not to “strangle” the handlebars.
- Time each of your hill repeats and try to maintain or improve the time on each attempt.
- Following the hill, there is a long recovery. Get your pulse down as quickly as you can by spinning and relaxing.
- Complete 3-8 trips on this course.
- If you feel weak or overextended during the first attempt, stop the workout and just spin for a few minutes. This wasn't your day.
- Cool down and stretch the quads, hamstrings, and gluteus.

# Long Bike Brick

**Purpose:** This workout simulates the last two legs of a triathlon or duathlon. The emphasis of this workout is on completing a duration bike leg before finishing with a fast-paced run.

## **CompuTrainer set-up:**

- **Program:** Any course or combination of courses that take one to two hours to complete.
- **Race Against:** Pacer, Level \_\_\_\_\_
- **Your Weight:** (Actual Weight)
- **Target Heart Rate:** Min \_\_\_\_\_ (lowest 1 zone value); Max \_\_\_\_\_ (highest 3 zone value)
- **Drafting:** OFF
- **Set a fan at face level**

## **Workout:**

- Ride the course(s) keeping pulse in the 1-3 zones.
- Following the bike leg, transition quickly to a 20-minute run at race pace/effort.
- Cool down by walking and stretch well.

# Short Bike Brick

**Purpose:** This workout simulates the last two legs of a triathlon or duathlon. The emphasis of this workout is on completing a race-effort bike leg before finishing with an endurance run.

## **CompuTrainer set-up:**

- **Program:** Any course that takes 45 minutes to one hour to complete.
- **Race Against:** Pacer, Level \_\_\_\_\_
- **Your Weight:** (Actual Weight)
- **Target Heart Rate:** Min \_\_\_\_\_ (lowest 4 zone value); Max \_\_\_\_\_ (lowest 5 zone+10 beats)
- **Drafting:** OFF
- **Set a fan at face level**

## **Workout:**

- Ride the course using the first few minutes to warm up and then gradually build into the 4 and 5 zones. Treat this like a race by staying mostly in aero position.
- Following the bike leg, transition quickly to a 45- to 90minute run at an easy, long-run effort/pace.
- Stretch well afterwards.

# Race Simulation Brick

**Purpose:** This workout simulates the last two legs of a triathlon or duathlon. The emphasis of this workout is on completing a race-effort bike and run.

## **CompuTrainer set-up:**

- **Program:** Any course that takes one-third to one-half the time to complete as the course of your next most important race.
- **Race Against:** Pacer, Level \_\_\_\_\_
- **Your Weight:** (actual weight)
- **Target Heart Rate:** Min \_\_\_\_\_ (Depends on distance - long courses use lower heart rates)  
Max \_\_\_\_\_
- **Drafting:** OFF
- **Set a fan at face level**

## **Workout:**

- Ride the course using the first few minutes to warm up and then gradually build into the race-specific zone. Treat this like a race by staying mostly in aero position and riding at race effort.
- Following the bike leg, transition quickly to a run course which takes one-third to one-half the time to run as the course you will next race on. Run it at race effort/pace.
- Walk for a few minutes afterwards and stretch well.

# Long Climbs

**Purpose:** This workout will improve your anaerobic threshold speed, strength, general hill climbing ability, and concentration.

## **CompuTrainer set-up:**

- **PC Course:** Create a 3 mile course with a 6% grade
- **NES Program:** Custom courses... *Set as follows*

| Leg | Miles | Grade |
|-----|-------|-------|
|-----|-------|-------|

|   |     |     |
|---|-----|-----|
| 1 | 3.0 | 6.0 |
|---|-----|-----|

|       |     |  |
|-------|-----|--|
| Total | 3.0 |  |
|-------|-----|--|

- **Race Against:** Pacer, Level \_\_\_\_\_
- **Your Weight:** (Actual Weight)
- **Target Heart Rate:** Min \_\_\_\_\_ (lowest 4 zone); Max \_\_\_\_\_ (lowest 5 zone+3 beats)
- **Drafting:** OFF
- **Set a fan head-on at face level**

## **Workout:**

- Warm up at least fifteen minutes before starting.
- Stay in the saddle all the way to the top being very respectful of your knees with judicious gear selection. Maintain cadence at 70 rpm or higher. Experiment with gears and positions on the saddle. Keep your fingers nimble on the bars - no death grips.
- Your pulse should vary from the low-end of the 4 zone to five beats above anaerobic threshold, but generally rise throughout the climb.
- Beginning riders should complete no more than one trip over this course, while experienced riders may do three. Recover 8-12 minutes between trips.
- In your journal, note the time of each climb and the gears used plus anything you may have learned about position, cadence, or mental focus.
- Cool down and stretch the quads, hamstrings, and gluteus.

# Rollercoaster

**Purpose:** This workout will improve your aerobic capacity and power. This is a stressful workout for which you must be rested.

## **CompuTrainer set-up:**

- **PC Course:** union\_bay\_rollercoaster.crs or
- **NES Program:** Road Race/Course...Union Bay Rollercoaster
- **Race Against:** Pacer, Level\_\_\_\_(or "Last Race, PGM #75)
- **Your Weight:** (Actual Weight)
- **Target Heart Rate:** Min\_\_\_\_(lowest 5 zone); Max\_\_\_\_(lowest 5 zone+10 beats)
- **Drafting:** OFF
- **Set a fan head-on at face level**

## **Workout:**

- Warm up for at least fifteen minutes before starting.
- The one-mile course alternates between flat, downhill, and uphill including a 3.5% grade for 0.1 miles just before half way and 8% grade for 0.1 miles at the end.
- Set the Pacer for a challenging level and race the length of the course. Increase the Pacer's setting on each subsequent attempt. As an alternative, set the "Race Against" to "Last Race PGM #75" so that you can race against your own previous attempt. This also means that each trip will be harder than the previous one.
- Recover for three minutes after each trip. As the season progresses, decrease the workout time each time you do this workout or recover until your pulse reaches the lower end of your 2 zone. If your fitness is improving, the recovery times should get shorter throughout the season at the same heart rate.
- Another alternative is to turn the "Draft" on. As you finish each trip over the one-mile course, immediately push the "F1" key again to restart the race. Recover on the first part of the course by drafting the Pacer.
- Your pulse should rise well into the 5 zone by the end of each attempt.
- Beginning riders should complete no more than four trips over this course, while experienced riders may do up to ten.
- Cool down and stretch the quads, hamstrings, and gluteus.

# Strength 1

**Purpose:** This workout is a weight-room-type strength session on the bike. The purpose is to strengthen your legs much as lifting weights with high repetitions would do. Do this workout 3-4 times in 2-3 weeks before progressing to Strength 2.

## **CompuTrainer set-up:**

- **Program:** Stand Alone, ergometer mode
- **Target Heart Rate:** 4 zone
- **Set a fan head-on at face level**

## **Workout:**

- Warm up at least fifteen minutes.
- Using your handlebar control unit, increase the wattage load to **30%** of your most recent maximum power output on the Power Test.
- Then do 4-7 reps of 2-3 minutes each with a gear that maintains your cadence at 70-80rpm with your heart rate no higher than the 4 zone.
- Recover in a very easy gear and light wattage load for five minutes between reps.
- Cool down and stretch the quads, hamstrings, and gluteus.

# Strength 2

**Purpose:** This is a weight-room-type strength session on the bike. The purpose is to improve your power output by developing greater strength in a way specific to cycling. Do this workout 3-4 times in 2-3 weeks before progressing to Strength 3.

## **CompuTrainer set-up:**

- **Program:** Stand Alone, ergometer mode.
- **Target Heart Rate:** 4 zone
- **Set a fan head-on at face level.**

## **Workout:**

- Warm up at least fifteen minutes.
- Using your handlebar control unit, increase the wattage load to **4.0%** of your most recent maximum power output on the Power Test.
- Then do 2-3 sets of 3-5 reps with each rep 40-60 seconds long. Select a gear that maintains your cadence at 50-60rpm with your heart rate no higher than the 5a zone.
- Recover between reps in a very easy gear and light wattage load for five minutes. Between sets, spin for eight minutes.
- Cool down and stretch the quads, hamstrings, and gluteus.

## Strength 3

**Purpose:** This workout is the third stage of the weight-room-type strength sessions on the bike. The purpose is to maximize your force generation by developing strength in a way specific to cycling. Complete workout 3-4 times in 2-3 weeks. Stop this workout if it aggravates your knees.

### **CompuTrainer set-up:**

- **Program:** Stand Alone, ergometer mode
- **Target Heart Rate:** 5a zone
- **Set a fan head-on at face level**

### **Workout:**

- Warm up at least fifteen minutes.
- Using your handlebar control unit, increase the wattage load to **50%** of your most recent maximum power output on the · Power Test.
- Then do 2-3 sets of 3-5 reps with each rep 40-60 seconds long. Select a gear that maintains your cadence at 50-60rpm with your heart rate no higher than the 5a zone.
- Recover between reps in a very easy gear and light wattage load for five minutes. Between sets, spin easily for eight minutes.
- Cool down and stretch the quads, hamstrings, and gluteus.



# ABOUT THE AUTHOR

**Joe Friel** has trained endurance athletes since 1980. His clients include recreational and professional road racers, mountain bikers, triathletes, and duathletes. They are located around the globe from England to the Caribbean, from Alaska to Florida, and from Boston to San Diego. Joe has a masters degree in exercise science and is a certified USA Cycling coach.

His company, Performance Associates Corp., provides fitness services to a wide variety of clients via fax, US mail, and telephone.

Joe writes monthly training columns for *VeloNews*, *Inside Triathlon*, and *Colorado Racing* magazines, and contributes features to magazines such as *Runner's World*, *Masters Sports*, and *Women's Sports & Fitness*. He has written a fitness column for the *Fort Collins Coloradoan* newspaper since 1981.

He conducts workshops around the country on training and racing for endurance athletes and provides consulting services for corporations in the fitness industry.

An avid **CompuTrainer** user since 1991, Joe is an outstanding age-group competitor. He is a Colorado State Triathlon Champion in his age group, a Rocky Mountain region and Southwest region duathlon age-group champion, and has been named to an All-American team every year since 1991. A member of US Triathlon Federation's national teams in 1993 and 1994, he is a top contender in world-class events. He also competes in road-running races and USCF time trials.

From his home at the foot of the Rocky Mountains in Fort Collins, Colorado, Joe enjoys mountain biking in the foothills with wife, Joyce, lake swimming with friends, and hiking and cross-country skiing on mountain trails with son, Dirk - a professional cyclist.

## Comments

If you have training questions or suggestions for future revisions of this manual including your own CompuTrainer-specific workouts, or to schedule a clinic for your club or group, call Joe at (970)226-4967, fax (970)204-4221, or e-mail [jfriel@ultrafit.com](mailto:jfriel@ultrafit.com). Please send all written responses and inquiries to:

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# Electronic Bike Fitting Process

**By Roger Young, *former Olympic Cycling Team Coach***

Years ago, bike fitting was an art done by expert coaches with years of experience. Coaches would visually critique and adjust the positions by sight. Then along came the mechanical kit that allowed bike shops to measure riders. Expert riders had also defined equations and procedures for taking measurements to fit riders to bikes.

The problem with the kits and experts' books is there is no interaction and it is presumed that nobody has special conditions. The truth is everyone has special conditions, and there is always need for position tuning and fitting even when standard equations and procedures for taking measurements to fit riders to bikes.

Using a CompuTrainer, anyone can fit any rider expertly to his or her bike safely and accurately through electronic means. The process puts people on their own bikes riding under conditions similar to the level and type of riding they want to be adjusted to. The way it works is to compare heart-rate to watts of power output at various riding positions, adjusting to the lowest power "cost" for the specific riding speed and terrain chosen. Here are some of the advantages:

The process uses the person's own bike and equipment.

The adjustments to posture and position are done under real riding conditions.

Different positions may be defined for specific riding terrain and levels of riding.

It's easy to perform the fitting.

It's fun because of the rider interaction (riders see their riding become more effective throughout the fitting process).

The procedure is repeatable.

A person's performance is improved by 5-15% compared to standard fitting.

The theory behind the process is this: By using physiological responses to determine where the bike needs to be adjusted, a correct position is achieved. This assures that the bike complements the anatomy of the rider. It also means that a rider's bike may be finely adjusted to optimize performance under various conditions like climbing, time-trials, or sprinting. Since performance itself determines the best position, optimum performance is guaranteed.

## ***ELECTRONIC BICYCLE POSITIONING INSTRUCTIONS***

**Find out what level and type of riding the person will be doing.** Make sure you ask the person what the majority of their riding will be. For beginners, you will need help with determining common speeds and terrain that is common for your area. This will be an important reason for re-adjustment sessions with riders whose riding levels or types of riding change over time.

**Choose the speed and gear you will run in the position evaluation.** Here's a table you can use to select speeds for different groups.

| <b>Level</b>  | <b>Suggested Speed</b> | <b>Suggested Gear</b>                  |
|---|------------------------|--|
| <b>Beginner</b> (mountain biking)<br>(hilly road)<br>(road) | 8-12 mph<br>12-14 mph  | 42 X 18-21<br>42 X 18-18               |
| <b>Intermediate</b> (mountain biking)<br>(hilly road)       | 10-14 mph              | 42 X 14-16                             |
| <b>Recreational Racer</b> (mountain biking)<br>(hilly road) | 12-16 mph<br>16-20 mph | 42 X 14-16<br>53 X 16-18               |
| <b>Expert</b> (mountain biking)<br>(hilly road)<br>(road)   | 14-18 mph<br>20-24 mph | 46 X 15-18<br>53 X 18-20<br>53 X 16-18 |

Try and choose a gear that the rider can steadily pedal at about 80 rpm.

- **Configure the CompuTrainer for the course reflecting the specific type of riding.**

Set up three six-mile courses (flat, 3% grade, and 6% grade).

- **Check the screen to be sure the profile (top of the screen) reflects the course profile you want.**

Become familiar with CompuTrainer configuration processes.

- **Set the rider's weight (include the weight of the bike)**

- **Do a general bike positioning setup.**

Experienced riders should already have a general setting they are comfortable with. New riders should stand next to the seat of the bike facing forward (toward the handle bars with the bike level on the ground.) Then set the seat height about an inch below the rider's hip bone. You should be able to see the rider achieve a flat back when the elbows are bent 90 degrees (this should give the rider the beginning of an aerodynamic posture). You should also see maximum leg extension between 150-170 degrees (from thigh to shin over the knee). Once you do the general setting, you should allow the rider to sit in the posture that is most comfortable for the type of riding you're adjusting towards.

- **Put the bike on the CompuTrainer and perform the spin-down calibration of rolling resistance.**

If the handlebar controller does not accept the setting, reduce the pressure on the rear tire friction roller. A setting between 2.0 lbs and 3.0 lbs is typical.

- **Have the rider mount the bike, ride easy, clip on the earlobe heartrate sensor, and select the appropriate gear.**

- **Start the person riding at the chosen speed.**

- **When the rider's heartrate has stabilized, note the heartrate and watts, and have the rider dismount.**

Be sure the person is riding at a level that the rider will be able to repeat through the adjustment sessions.

- **Mark the position of the component you will be adjusting, make a modification, then repeat steps 9 and 10.**

- **If the modification shows lower heartrate, go back through steps 9-11 repeatedly, making modifications in one direction (up/down/front or back) at small increments (about 3mm) until you no longer see a continued drop in heartrate.**

- **If your first modification does not show a drop in heartrate, go back to the original setting and modify in the opposite direction, going back to step 9.**

- **When you observe a rise in heartrate, having modified in both directions, you should be able to identify the optimum setting for the component.**



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