ELLIPTIGO-INTEGRATED
TRAINING FOR PERFORMANCE ATHLETES

ELLIPTIGO®

Why ElliptiGO?

The ElliptiGO elliptical bike has quickly become one of the most sought-after cross-training tools to substitute and supplement runs. By engineering the ElliptiGO bike to be a weight-bearing, impact-free training tool that mimics the running motion, we have created the most efficient non-impact means of achieving running goals through cross-training. The biomechanical engineering of the ElliptiGO bike helps runners engage the same muscles required when running, but without the negative side effects of impact that can sideline an athlete and end a season.

By proactively integrating the ElliptiGO bike into training, runners can not only train harder, but they can stay healthy and remain mentally engaged while doing it. This approach keeps athletes more consistent and gives them a better chance of reaching their individual performance goals.

Opportunities for Integration

Cross-training has historically been viewed by the running community as a reactive means to combatting injury. While the ElliptiGO bike can definitely be used in this scenario, we believe in also being proactive in the approach to cross-training. We believe that a proactive approach will help athletes and teams avoid season-ending injuries, while still allowing them to reach their maximum performance potential. As Meb Keflezighi stated after his Boston Marathon victory, "Don't wait until you get injured to get on the ElliptiGO bike. If you can stay consistent and healthy, you will perform. The results speak for themselves." There are two basic ways the ElliptiGO bike can be integrated into a program: as a substitute and as a supplement.

As a substitute, the ElliptiGO bike can help injury-prone athletes continue training at a high volume without having to incur as much of the injury-causing impact that prevents them from training consistently season after season. In addition, athletes who may already be injured no longer have to fall behind or lose the effect of their hard-earned fitness. A recent study from Ohio University, as well as multiple case studies, has shown that over a 4-6 week period, highly trained runners are able to not only maintain, but improve, physiological biomarkers (VO2, RCP, LT, AT, etc.) just as they would when running. This is accomplished through the simple formula of matching time and intensity (HR) of the desired run session while riding the ElliptiGO bike. For more information on this research and to discuss the training protocol, contact athletics@elliptigo.com.

As a supplement, the ElliptiGO bike continues to help athletes safely push their limits and reach new levels of performance. Integrating ElliptiGO into current training regimens allows athletes to increase the total volume of work they perform without increasing the amount of impact-related stress and strain on the body. Unlike other cross-training modalities, the ElliptiGO bike provides an ability to hit a range of heart rates and training zones similar to when running. This allows coaches and athletes to add in not only additional quantity, but additional quality as well.

The Four Pillars of ElliptiGO Integration

There are four key types of ElliptiGO workout that will help coaches intimately understand the broad-spectrum applicability of the ElliptiGO bike and provide athletes with a comprehensive approach to supplementing and/or substituting their running. While the following suggestions provide a wide array of integration opportunities, studies have ultimately shown that any running session can be accomplished on an ElliptiGO bike by replicating time and intensity (Heart Rate) intervals.

1. **Short Hill Sprints or Intervals:**
   a. **GO Hard Hill Sprints (8-12 reps):** This session consists of :30 sprints up a 4-6% grade hill with a :90 coasting recovery back down the hill. This workout will help build power and motor recruitment in athletes throughout the posterior chain, while also putting them into a state of oxygen debt that will have their muscles fatiguing and fighting through lactic acid accumulation by the end of the session.

   b. **Lane-8 Intervals:** Any track session can be turned into an ElliptiGO workout with ease through the Lane-8 Interval concept. To achieve this session, have the ElliptiGO athlete complete their intervals in the outside lanes of a track while their teammates run the same workout on the inside lanes. The rider will undoubtedly ride faster than the runners, but will only stop his/her interval when his/her teammates reach their finish line. The rider then coasts around the track back to the starting line during the recovery interval so that they can start the next repetition alongside their teammates. By matching the time duration and HR (or Perceived Exertion) of the riding athlete to that of his/her running teammates, the same physiological benefits will be achieved.

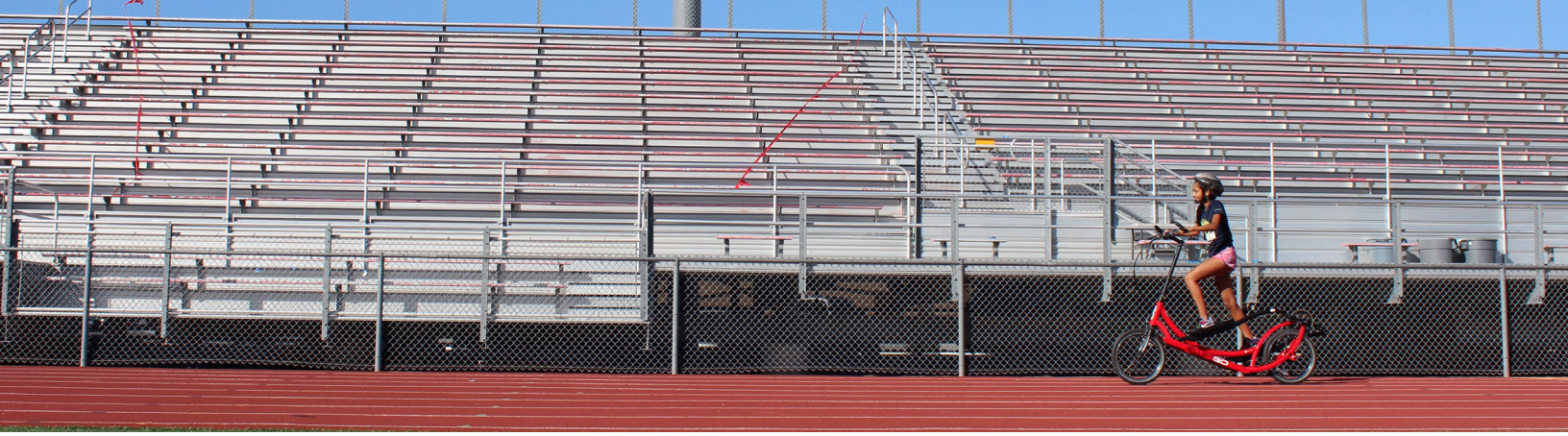
c. **ElliptiGO Intervals:** Three basic ElliptiGO workouts have also been created that, when adjusted for intensity (target HR) and recovery length, can accomplish a wide array of training goals. The effects of this type of workout can range from aerobic to high-end lactic based on the time of the interval/recovery and the TargetHR achieved (see intensity table – "IT"). The workouts are:

   i. GO 400s – 20x400m@TargetHR w/:45-:90 rest or a 200m coast directly into the next interval.
   ii. GO 800s – 10x800m@TargetHR w/:60-2:00 rest or 1 lap easy directly into the next interval.
   iii. SHIFT 600s – This is a high end lactate workout that requires a 200m build-up period straight into a maximum effort 400m sprint with full recovery between intervals. Aim for 3-5 intervals, or until the athlete's 400m sprint time slows by more than 3 seconds from their fastest interval.

2. **Consistent Hill Climb:** Generally, distance runners try to get in a longer steady state run once every 1-2 weeks. A continuous climb up a 5-10% hill grade for 60-90 minutes on an ElliptiGO bike will mimic this workout perfectly. This is one of the most powerful sessions an athlete can accomplish on the ElliptiGO bike, because in addition to the beneficial effects to AT, the athletes also build both muscular and mental strength throughout the duration of the climb. When riding on flat land and descents, it is possible for an athlete to disengage and coast from time to time. On a consistent climb, the athlete is forced to continue working in order to continue progressing, just as in running. When fatigue builds, the athlete will have to stay mentally engaged and tough to complete the workout, which they can accomplish without concern for major form breakdown and resulting impact-related injuries. Generally athletes will also recover relatively quickly after this session when compared to running for a similar duration at a similar rate of effort.

Tips to effectively completing this workout:

a. The more consistent the climb, the more consistent the athlete's HR will be throughout the interval, therefore better replicating the desired effects of a threshold or steady state effort.
b. Athletes have a tendency to want to power through a hill in a high gear. Instead, tell them to focus on maintaining a high rate of turnover and a good balance between turnover and forward progress. For a 5-7% grade, it is not unusual for an athlete to ride in gears 3-5, especially as the desired duration increases.



3. **Long Ride:** Distance runners typically get in one long run every week. On an ElliptiGO bike, athletes can get in a couple of long rides (2+ hours) each week. Without the impact, athletes can increase volume without taking away from the next workout on schedule. This can be accomplished a few different ways:

    a. **ElliptiGO Chaser** – In place of the typical mid-week, medium-length long run, an athlete looking to increase volume, one who has a hard time with volume or one recovering from injury can increase overall workload by doing a slightly shorter run and immediately hopping on the ElliptiGO bike for additional time. For example, if the goal of the Wednesday run is 90 minutes of time spent in an aerobic state, but an athlete is currently at or limited to 60 minutes of running, the athlete can still get the benefit of additional "time on their feet" at an elevated HR by adding the last 30 minutes on the ElliptiGO bike. This gives them the total goal volume for the workout (and physiological effect on biomarkers), without the impact or an increased risk of impact-related injury. This workout can also be applied to an athlete's weekly long run or other runs that seek to attain similar results.

Session Name	Goal: 90-minute Elevated HR	Realized Benefit(s)
Mid Long Run	90 minutes Running	Improved Running Economy, Aerobic Efficiency & Energy Utilization
ElliptiGO Chaser	60 minutes Running + 30 minutes ElliptiGO (immediately after run)	Improved Running Economy & Aerobic Efficiency Improved Aerobic Efficiency & energy Utilization

b. The DL (Double-Long) – For pure distance runners, volume and cardiovascular efficiency are important aspects of training. The typical schedule on a non-race weekend for any athlete mid-distance and up will generally include a Long Run and an easy recovery run, active recovery day or even day off. The DL allows athletes to receive the recovery benefits of increased blood-flow and reduced impact, while also getting the benefits of an additional weekly training session. Case studies have revealed that many athletes tend to feel better for Monday's training session when they follow up a long run with a lengthy ElliptiGO ride than they do after completing a recovery run or even taking the day off. For example, if the typical weekend schedule includes a 90 minute-2 hour long run on Saturday followed by a recovery session (3-5 miles easy, active stretching or day off), then the adjustment would consist of the typical Saturday 90 minute-2 hour long run, followed on Sunday by a 90 minute-2 hour long run DL ride.

Session Name	Goal: Non-Racing Weekend	Realized Benefit(s)
Weekend Session Sat: Long Run Sun: Recovery Day	90 minutes - 2 hours Running 5 miles easy, active recovery or day off	Improved Running Economy, Aerobic Efficiency & Energy Utilization Maintenance & Recovery
Double-Long Sat: Long Run Sun: Recovery Day	90 minutes - 2 hours Running (or) ElliptGO Chaser Combo 60 minutes - 2 hours ElliptiGO	Improved Running Economy, Aerobic Efficiency & Energy Utilization Maintenance & Recovery + Increased Bloodflow & Additional Aerobic Development

c. **GO Long** – For athletes who cannot run at all, the ElliptiGO bike provides the most run-specific replacement tool for non-impact, outdoor cross-training. During this time, the athlete can still maintain (and even increase) all the physiological effects on biomarkers such as VO2Max, AT, LT, etc. Plus, due to the lack of pounding, the athlete can even increase his/her typical volume in respect to time spent exercising without additional risk of impact-related injury or setback. It is encouraged that athletes also engage in supplemental strength/weight-bearing training during this time (to the extent that their injury will allow) to help mitigate the reduction of their running economy and ability to handle future ground-impact forces. Without the impact to stimulate neuromuscular connectivity, it is important that the athlete engage in these exercises as permitted by their physician.

Session Name	Goal: Non-Racing Weekend	Realized Benefit(s)
Long Run	90 minutes - 2 hours Running	Improved Running Economy, Aerobic Efficiency & Energy Utilization
Go Long	2 hours(+) ElliptiGO + Supplemental Weight-Bearing Strength Training	Improved Running Economy, Aerobic Efficiency & Energy Utilization + Increased Bloodflow & Additional Aerobic Development

4. **Tempo Ride:** If there is a long stretch of road or loop where an athlete can ride 20-35 minutes uninterrupted, he/she can replicate a tempo run while riding with the same rate of effort. The athlete can also replicate the physiological goal through cruise intervals with short rest by finding a 5-10 min loop or stretch of uninterrupted road. The athlete should do 4-8 intervals at a HR correlating to a Tempo/CI effort (see IT) and take minimal rest between intervals (min :30, max :90). To accomplish this session effectively, it is important that the athlete remain mentally engaged throughout the entire interval and resist the urge to back off or coast. Maintaining a certain HR level is the best method for ensuring that the workout is being completed properly.

Tips & Intensity Table (IT)

Adjusting a workout on the fly: There are two basic metrics that allow you to turn any run-training session into an ElliptiGO session at a moment's notice: time and heart rate – or time and perceived exertion if a HR monitor is not available. By matching time and HR (see IT) of any running session to an ElliptiGO effort, an athlete can receive the same physiological benefits. For example, if an athlete is scheduled to run 10x400 in :60 with :60 rest between intervals, then the correlating ride would be 10x:60 efforts at a HR equal to that achieved during the interval session with the same :60 rest in between. The results, as confirmed in a study by Ohio University, would be consistent improvements across physiological biomarkers such as VO2, RCP, LT, AT, etc.

Shifting & Cadence: Many athletes are not used to the physical shifting of gears throughout a training session, let alone efficient shifting. As high performance athletes, runners are always looking to push the limit and many athletes find themselves trying to muscle through higher gears instead of efficiently using a higher cadence to traverse their intended course. Whether it is an easy ride, long ride, or workout, we suggest the athlete utilize mid-to-upper range gears for the majority of their session, only getting into the ultimate top gears during top-end speeds and on descents (where necessary). Upon coming to a hill, the key to an efficient climb and avoiding HR spikes is to focus on maintaining consistent turnover as opposed to consistent pace. This can be accomplished by down-

shifting as needed when resistance builds and cadence slows. With little practice, an athlete will quickly be able to identify and predict a shift before it needs to occur. Likewise, when beginning an interval, it is better to start in gears 4-6 and upshift as momentum builds. The athlete will generally reach gears 7-8 by the time they reach top-end speeds for the interval. The faster the interval, the more efficiently they will be able to ride in a higher gear.

Beneficial Post-Ride Ancillary Work

1. **Hurdle Drills** – Performing hurdle drills after an ElliptiGO ride will help the athlete to retain quality range of motion (ROM), balance and proprioception. Hurdle Drills require the recruitment of muscle fibers under extreme flexion and extension. This will help the athlete to maintain strength of flexibility throughout their trunk, hips and the soft tissue of the lower extremities. They are also performed primarily on one foot at a time, which will help the athlete prepare for their return to on-ground running.

2. **Weight-Bearing Strength Training** – Due to the removal of impact through ElliptiGO-integrated training, it is important (especially in those athletes not running at all), to combat the reduction of the athlete's ability to handle ground-impact forces. Through an integrated S&C program (as approved by team doctors), the athlete will be more prepared when they return to their assigned levels of running.

Intensity Table

Workout	%HRMax, Range of PE
General Mileage	50-70%, 5-7
Easy/Recovery Run	50-70%, 5-6
Long Run	70%+ (will increase with fatigue), 7+
Tempo (10k-HMGP) Run	85-90%, 8-9
Steady (MGP) Run	83-87%, 8+
Intervals	87-92%, 9
Power Hills	100%, 9-10
VO2Max Hills	100%, 8-10

Questions/Comments?

For questions or assistance, please contact:
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