



4 WEEKS TO  
YOUR FASTEST  
LEG SPEED IN  
ANY SPORT

# SPEED RUNNER

**PETE MAGILL**

Creator of the SpeedRunner  
system, 19x national championship coach, multiple  
American and world age-group record holder

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# THIS IS SPEEDRUNNER

In sports, the difference between a star and an also-ran is tenths of a second.

Athletes who are faster, stronger, and quicker dominate. Athletes who lack these characteristics languish. This is true no matter the sport. In football, 40-yard-dash times can determine who gets playing time and who rides the bench. In soccer, the ability to execute a change-of-direction dribble can make the difference between a shot on goal or the defender clearing the ball. In basketball, there is no fast break on a team with slow feet. In tennis (which averages 3 to 5 changes of direction for 8 to 12 yards of movement per point), a sluggish first step can lead to a win—for your opponent. In baseball, your speed to first base can earn you a hit, while a middle fielder's speed and lateral quickness can rob you of the same. In volleyball, there's no spike or block without the vertical explosiveness to rise above the net. And in track & field, athletes who can generate the most horizontal and vertical force go home with the medals.

## » SPEEDRUNNER

A student of advanced human locomotion; someone who trains his or her nervous system and muscles to produce maximum speed, power, and agility

In sport after sport, it's the speed, strength, and agility you produce with your legs that determines what you can accomplish on the field, court, or track.

There's an old-school saying in track & field: "God makes sprinters, coaches make milers." This outdated belief stems from the erroneous assumption that you're stuck with the speed that God, evolution, and your parents gave you. Maybe you can build a bigger heart and better endurance to become a miler, but improve your speed? *No way!* Except that modern sprint coaches figured out a way, and in 2016, a total of 23 runners recorded 53 performances at 100 meters that were faster than Carl Lewis (*Sports Illustrated's* Olympian of the Century) ran for his 100-meter gold medal at the 1984 Los Angeles Olympics.

Across all sports, athletes are getting better, and their skill set of speed, strength, and agility is improving. When you consider that, in America, approximately 45 million youth athletes (ages 6 to 17) and 25 percent of the adult population are active in sports, coaches can be forgiven for skipping over athletes who aren't prepared. Frankly, if your skill set is lacking, you need to improve it. These days, showing up for a team-sports tryout or competition without a developed skill set is like taking on Joey Chestnut at Nathan's Famous International Hot Dog Eating Contest without an appetite.

Al Davis, the late, outspoken owner of professional football's Oakland (soon to be Las Vegas) Raiders, famously said, "You can't teach speed." Lucky for you, Al Davis was wrong. Speed *can* be taught. And it *can* be learned. In fact, not only can speed be learned—along with strength, agility, balance, and proprioception—but it's essential that any athlete looking to achieve his or her maximum potential do just that.

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## WHAT'S THE SPEEDRUNNER SYSTEM?

**THE SPEEDRUNNER SYSTEM** is a 4-week, 12-session program designed to improve your athletic performance. There are also modified schedules for athletes focused solely on speed (e.g., team-sports athletes already enrolled in agility and strength-training programs), endurance athletes looking for a once-a-week combination speed- and injury-prevention workout, and fitness enthusiasts who'd like additional, stand-alone sessions beyond the initial program.

SpeedRunner creates positive training adaptations by teaching your nervous system to better control your muscles and connective tissue (e.g., your bones and tendons). It targets three physical skills that are a requirement for every sport.

<b>SPEED</b>	<b>STRENGTH</b>	<b>AGILITY</b>
Your ability to accelerate from your first step through maximum velocity	Your ability to generate force using your nervous system and muscles	Your ability to change direction rapidly

Of course, it all begins with speed. Speed is a dividing line in sports, like height requirements for amusement park rides. Once you have speed—the ability to move from point A to point B faster than others on the field, court, or track—you’re already, literally, a step ahead of the competition. Add strength and agility, and you have a skill set that’s prized in every sport.

The SpeedRunner system grew out of my own five-decade involvement in sports. I was a multisport athlete growing up, but my turning point in workout philosophy dates back 35 years to my time in Eugene, Oregon (America’s track mecca), where I was training as a middle-distance runner. A friend of mine who ran with Nike’s elite Athletics West program would meet me once a week under the bleachers at Hayward Field—rain beating down on the track, our breath like fog in the frigid temps, both of us bundled in sweats—and teach me the technique drills he’d learned with the club. We’d skip, bound, march, and do the Ovett Drill (a variation of Quick Feet named after one of the world’s best milers), alternating reps of each drill with a sprint, for roughly two hours. The workout was designed to create nervous system adaptations that result in a more efficient stride. And, voilà, the next day my stride would be smoother and my pace faster.

A few years later, I was training at Brignole Fitness Club in Pasadena, California, which was owned by 1986 weight-class champion in the AAU Mr. America and Mr. Universe competitions, Doug Brignole. One of my workout partners, John, a beefy offensive lineman for a local junior college, a monster who bench-pressed more than 500 pounds, took me aside and said, “Pete, Ohio State’s offered me a scholarship, but only if I can drop three-tenths off my 40.” He knew I was a high school track coach—and that my team had won the league championship due to the domination of my sprinters. “Can you help me?”

I designed a program to get John those three-tenths, one that included the Oregon drills and other exercises. In the end, John signed with a Southern California school. But my interest was piqued: Just how much could a program that targeted nervous system adaptations improve speed in non-track athletes?

Flash forward to the summer of 2015. I put the results of years of training, coaching, and research to the test, finalizing the SpeedRunner system and offering it to

## Speed in Sports

Different sports use different metrics to define speed. The NFL Scouting Combine uses the 40-yard dash. FIFA utilizes the top speed reached during a match to rank its fastest athletes. In track & field, the Olympic 100-meter champion has traditionally been declared the world's fastest human. To see how a few well-known athletes from a few different sports compare, let's break down each sport's unique metrics into miles per hour [mph] and kilometers per hour [kph]:

Football	40-YARD DASH TIME	NFL COMBINE
Bo Jackson	4.12* sec.	19.86 mph or 31.96 kph
Chris Johnson	4.24 sec.	19.29 mph or 31.04 kph
Deion Sanders	4.27 sec.	19.17 mph or 30.88 kph

\* Jackson's time might not have been run at the NFL combine, and there is conjecture that his time might also have been inaccurately recorded. [Jackson himself, during a 2016 ESPN His & Hers interview, claimed to have run 4.13.]

Tennis	TOP SPEED WHEN SPRINTING 3+ YARDS DURING A MATCH
Novak Djokovic	22.38 mph or 36.02 kph
Andy Murray	21.67 mph or 34.87 kph
Roger Federer	16.17 mph or 26.03 kph
Simona Halep	14.31 mph or 23.04 kph
Maria Sharapova	12.81 mph or 20.61 kph
Serena Williams	12.75 mph or 20.52 kph

Soccer	TOP SPEED RECORDED DURING A MATCH
Gareth Bale	22.93 mph or 36.9 kph
Cristiano Ronaldo	20.88 mph or 33.6 kph
Lionel Messi	20.19 mph or 32.5 kph

Track & Field	100-METER DASH TIME	VARIOUS MEETS
Usain Bolt	9.58 sec.	23.35 mph or 37.58 kph
Carl Lewis	9.86 sec.	22.69 mph or 36.51 kph
Jesse Owens	10.20 sec.	21.93 mph or 35.29 kph
Florence Griffith Joyner	10.49 sec.	21.33 mph or 34.32 kph
Shelly-Ann Fraser-Pryce	10.73 sec.	20.85 mph or 33.55 kph
Evelyn Ashford	10.76 sec.	20.79 mph or 33.46 kph

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<b>Baseball</b>	<b>HOME PLATE TO FIRST BASE TIME</b>	<b>FASTEST RECORDED TIME</b>
Mickey Mantle	3.10** sec.	19.80 mph or 31.87 kph
Billy Hamilton	3.52 sec.	17.44 mph or 28.07 kph
Mike Trout	3.53 sec.	17.39 mph or 27.99 kph

\*\* Mantle's mark was hand-timed in the early 1950s, and there is no film or official timing data available to validate the mark—even so, Mantle was universally considered to be the fastest man in baseball during this period.

While it's impossible to reliably compare a football player's 40-yard dash and a soccer athlete's top speed [i.e., the former represents acceleration and the latter maximum velocity], it's safe to say that all these athletes are fast. If you're curious, the top speed ever recorded during an athletic event belongs to Usain Bolt, who clocked 27.8 mph (44.72 kph) from 60 to 80 meters during the 100-meter final at the 2009 Berlin World Championships in Athletics.

30 local high school student athletes. On Day One, all athletes were evaluated using four metrics tests:

1/ 40-yard dash 2/ 20-yard shuttle 3/ 3-cone drill 4/ Standing broad jump

The first test measured speed. The next two measured agility. The fourth measured explosive horizontal and vertical force. After four weeks of training, the student-athletes were tested again. Of those who had completed the entire program, 40-yard dash times improved by an average of 9 percent, with only one athlete failing to improve and all others lowering their times by at least three-tenths of a second. In the other tests, improvement varied between 10 and 15 percent.

There's nothing magical about the SpeedRunner program. Your nervous system controls your muscles. When you improve your nervous system's control of your muscles, while strengthening those muscles and their associated connective tissue (the tendons that connect each muscle to bone), you get faster, stronger, and quicker.

## **>> NEUROMUSCULAR**

Jointly using your nervous system and muscles; nervous system control of your muscles to create speed, strength, and agility

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## LET'S TALK THE SPEEDRUNNER SYSTEM

**THE SPEEDRUNNER SYSTEM** teaches your nervous system to use your muscles more effectively and efficiently. In Chapter 5, we'll cover this neuromuscular process in depth. For now, it's important that you have a general understanding of how this process works to produce movement.

As an athlete, you produce movement like this: Your nervous system sends signals to your muscles, your muscles contract, and then those muscles pull on tendons that connect to bones, altering the angle of your joints (e.g., bending a knee, straightening a hip, or flexing an elbow). Your nervous system doesn't control each muscle in isolation. Instead, it activates groups of muscles—what's called a “motor module”—in a specific sequence. It's those sequences that control movement. When you exercise using specific movements to generate speed, strength, and agility, your nervous system becomes more effective and efficient at recruiting the best motor module sequences to perform those skills. You get faster, stronger, and quicker.

How fast can these new nervous system activation patterns emerge? A 2016 study had subjects attempt a gait (similar to marching) with which they had no experience. By monitoring the subjects, the researchers were able to detect significant changes in neuromuscular activation “within the first few strides of attempting the new gait pattern” (Ranganathan et al. 2016). This indicates that the subjects' nervous systems began adapting immediately, experimenting with more efficient ways to perform the new gait.

A 1998 study defines this “initial, within-session improvement phase” as “fast learning” (Karni et al.). That's followed by a period during which your nervous system consolidates what it has learned, which might take several hours. After that, “slow learning” occurs, a process that might last days, weeks, months, or years—“consisting of delayed, incremental gains in performance emerging after continued practice.”

SpeedRunner utilizes your nervous system's ability to adapt as both a “fast” and “slow” learner. By the end of your first session, you'll already be developing nervous

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### »» SPEED

The rate at which you self-propel over the ground; your ability to accelerate [i.e., increase speed] or maintain a high maximum velocity [i.e., top-end speed]; a performance goal of being faster than your competition

system adaptations that will improve your performance. By the start of your second session, those adaptations will be absorbed. (Anyone who's practiced shooting free throws, skipping rope, balancing a barbell during weightlifting, or performing other athletic skills can vouch for the improvement that occurs between sessions.) By the end of your four-week program, the accumulation of *all* your adaptations will be hard-wired into your neuromuscular system. Best of all, those adaptations will stick with you as you segue into practice for your primary sport. Or, if you prefer, you can continue training the SpeedRunner way with weekly stand-alone sessions designed to maintain your fitness and continue your neuromuscular development.

One last point: Consistency and repetition are big parts of the SpeedRunner system. Consistency—building on previous fitness gains before they're lost by not skipping workouts—is like walking up the down escalator. Climb faster than the steps descend, and you reach the top. Take too long a break, and the escalator carries you right back to where you started. Repetition is how initial adaptations become hard-wired. By performing specific movements over and over, your neuromuscular system becomes better at controlling them. This doesn't mean doing the same exercises every session. SpeedRunner includes variety, but it's a variety that reinforces gains you've already made, hardwires neuromuscular activation patterns, and builds incrementally toward a faster, stronger, and quicker you.

## Let's Talk SpeedRunner Training

The SpeedRunner system Core schedule breaks your training into four categories of exercises and drills—acceleration, maximum velocity, strength, and agility—and then makes each category a focus for at least one of your three sessions per week:

Session 1	Session 2	Session 3
ACCELERATION & STRENGTH	AGILITY [including balance and proprioception] & STRENGTH	MAXIMUM VELOCITY

Note that all sessions include training for all categories. Acceleration relies on enormous leg strength to provide the push that fuels your first steps. Agility is, by definition, a form of acceleration (as you'll discover in Chapter 6). Maximum velocity is largely dependent on your ability to generate eccentric strength (see "Eccentric Running Wins the Race," page 15)—not to mention that the only way to achieve maximum

## **Peak Height Velocity: They grow up so fast!**

Peak Height Velocity (PHV) is a fancy term for the period in life when adolescents experience their fastest growth—you know, when they sprout like weeds. Puberty. Girls tend to experience PHV earlier than boys, beginning at around age 11. According to the Centers for Disease Control and Prevention (CDC), girls gain an average of 2 to 4½ inches (5.4 to 9 cm) in height per year during this period. Boys don't reach PHV until about age 13, but they grow more once they get there, averaging 2½ to 5 inches (5.8 to 13.1 cm) per year. For coaches, parents, and young athletes, this raises a question: How will PHV affect training?

PHV is driven by an increased release of growth-related hormones, which are chemical messengers within your body that govern all aspects of biological function. Hormones are secreted by your endocrine system, then enter your bloodstream and travel to muscles, tendons, bones, organs, glands, and other tissues. Once there, they exert a multitude of effects. Many performance-enhancing drugs (PEDs), banned by almost every professional and amateur sports organization in the world, are either hormones or synthetic versions of hormones. During PHV, both boys and girls experience a huge increase in human growth hormone (HGH), which builds muscles, strengthens bones, and determines height. Boys also get an enormous bump in testosterone, a muscle builder and the mother of all steroid PEDs, with girls seeing smaller increases.

This combination of surging HGH and testosterone makes PHV an ideal time to introduce new types of training. A 2014 study found that 12 sessions of resisted sled towing produced big improvements in speed, leg stiffness, and force production in young athletes who were mid- or post-PHV, while pre-PHV study participants saw no improvement. Multiple studies concur that PHV is the time when athletes begin to see the benefits of resistance training, whether that's weight-sled work or pumping iron in the gym. The same studies advise restricting pre-PHV athletes to nervous-system-oriented training, like plyometrics and unresisted sprinting.

There's no denying that PHV opens the door for big fitness gains. Because of this, it's been called a window of opportunity, although there's no solid evidence that similar gains can't be generated post-PHV.

As a parent, coach, or athlete, you should keep in mind that any changes in a strength and conditioning program should be based on biological age (i.e., once PHV has begun) and not on chronological age. After all, some boys don't hit puberty until age 14 or 15. It's about the volume of muscle-building hormones in the bloodstream, not the candles on the birthday cake.

velocity is to accelerate. And general strength training stabilizes your body during all athletic movements, as well as being your number one defense against sports injuries.

### SPEEDRUNNER SYSTEM FOCUS

The SpeedRunner system's primary focus is speed and agility. For strength, SpeedRunner offers training to stabilize your body during sprints and change-of-direction movements (i.e., agility), promote injury prevention, and improve whole-body strength (e.g., legs, core, and upper body) to the level required for successful team-sports participation. Athletes from some sports—such as football, rugby, and the weight events in track & field—might need to schedule additional sessions in the gym to increase their bulk muscle strength.

### SPEEDRUNNER TRAINING SESSIONS

The SpeedRunner training sessions are designed to be performed at local schools, parks, or anywhere that has enough open space to let you run unobstructed for 30 to 40 yards. Two types of exercises and drills are offered:

**Props:** These exercise and drills require equipment, such as weight sleds and medballs. They're geared toward athletes who are part of athletic programs or have access to props (e.g., through a gym or purchase).

**No-props:** These exercises and drills require no props. All you need is a pair of shoes, and now and then a few stand-in props—for instance, paper plates in place of cones. Substitutes for props are offered in Appendix B, "Props, No-Prop Options, and Prop Swaps" (page 259). Additionally, all "props" exercises have a "no-props" alternative.

### YARDS VERSUS METERS

All measurements are given in yards (unless I am referring specifically to the track, in which case I will use meters, or to scientific studies that relied upon meters for the purpose of measurement). If you are used to meters, don't let this confuse you. A meter and a yard are interchangeable in setting up your training:

$$1 \text{ meter} = 1.09361 \text{ yards}$$

For untimed exercises and drills, you can use meters simply by switching the recommended yards to an equal number of meters. For example: 15 to 20 yards = 15 to 20 meters.

Each session should last between 20 and 60 minutes, depending on the length of your warm-up, your recovery time between the exercises, and the specific exercises scheduled for that session. You should always feel free to add additional recovery between exercises.

## SpeedRunner Book

The SpeedRunner book introduces you to the SpeedRunner system. It lays out the foundation for training, explains each targeted skill in depth, and details the kinds of training that most benefit each skill. Here's a peek at the chapters to come.

- ▶ **Chapter 2:** We break down the gait cycle (i.e., your running stride), and examine how SpeedRunner training addresses each phase of that cycle.
- ▶ **Chapter 3:** We look at acceleration, the most important phase of speed for most athletes.
- ▶ **Chapter 4:** We tackle maximum velocity, your top-end speed.
- ▶ **Chapter 5:** This is the strength chapter—we discuss how the nervous system and muscles work together to produce force.
- ▶ **Chapter 6:** Along with agility, we discuss balance and proprioception, which make agility possible.
- ▶ **Chapter 7:** This chapter offers a quick breakdown of your energy systems (how each fuels speed, strength, and agility), and methods for increasing speed endurance.
- ▶ **Chapter 8:** We talk recovery—most athletes fail to understand that you don't improve while you're training, you improve while you're recovering.
- ▶ **Chapter 9:** Here you'll find photo instruction for all exercises and drills included in the SpeedRunner schedules.
- ▶ **Chapter 10:** All of the schedules are found in this chapter.

## SpeedRunner Metrics Testing

Metrics testing is how SpeedRunner tracks your progress. You don't have to test, but if you'd like to monitor your improvement from pre- to post-training, then the following metrics tests, performed in the order listed, will do the trick.

**40-Yard Dash:** Tests acceleration (40 yards is also far enough for most team-sports athletes to reach maximum velocity)

**Standing Broad Jump:** Measures explosive horizontal and vertical force

**20-Yard Shuttle:** Measures lateral agility

**3-Cone Drill:** Measures horizontal and lateral agility

Take at least a 3-minute break between each test (that's how long it takes to restock the energy system you'll be using). Breaks as long as 10 minutes are okay. Feel free to add tests of your own (e.g., vertical jump) but always begin with the four tests listed above. Also, limit additions to one or two tests, as nervous system fatigue will negatively impact your performance with more than 4 to 6 tests. Full instructions for each metrics test are included in Chapter 9.

## SpeedRunner System Results

You should begin to improve during your very first SpeedRunner session, although significant and long-term improvement will require the full four weeks. Keep in mind that although your nervous system begins to adapt within seconds of starting an exercise or drill, it will take your muscles and connective tissue longer. They'll require at least 48 hours to fully repair post-workout, and it will take weeks before incremental gains result in noticeable adaptations.

### CHAPTER 1 FINAL WORD

The SpeedRunner system is a science-based, experience-tested, 21st-century training program designed to improve any athlete's performance and fitness—no matter the sport. Equally beneficial to youth and adults, SpeedRunner targets adaptations in the nervous system to build speed, strength, agility, balance, proprioception, and explosive power.

## ABOUT THE AUTHOR



Pete Magill is the lead author of the book *Build Your Running Body*, author of *The Born Again Runner*, and a former senior writer and columnist for *Running Times* magazine, where his popular “Performance Page” column tracked the latest advances in exercise physiology. A five-time USA Masters Cross Country Runner of the Year, two-time USA age group runner of the year, and three-time USA masters



track and field age group athlete of the year, Magill holds multiple American and world age-group records and has led his clubs to 19 national championships in cross country and road racing. He’s a high school sprint coach, running coach for the California Triathlon Club, and masters coach for the Cal Coast Track Club, as well as co-owner of SpeedRunner LLC and head instructor for all Southern California SpeedRunner training and instructor certification programs. He lives in South Pasadena, California.

# THE SPEED YOU NEED...

▶ for outsprinting the competition ▶ for juking your opponent on the field or court ▶ for setting PRs and improving performance

**IN ANY SPORT THAT INVOLVES RUNNING**, the difference between the best and the rest is tenths of a second. From team sports such as football, soccer, and basketball to individual sports like track and triathlon, faster leg speed makes champions.

*SpeedRunner* is your key to speed. Renowned coach Pete Magill's groundbreaking program is aimed at building crucial leg speed. By targeting the neuromuscular system and strengthening muscle and connective tissue, the *SpeedRunner* program builds speed, strength, agility, coordination, balance, proprioception, and explosive power so athletes can excel.

Along with its core 4-week program, *SpeedRunner* offers speed-only training, once-a-week speed work for distance runners, and single-day sessions focused on injury prevention and whole-body strength.



***SpeedRunner* will make you FASTER ▶ STRONGER ▶ QUICKER—no matter your sport!**

**PETE MAGILL** is a running coach, athlete, and author. As a coach, Magill has led his masters clubs to 19 USATF National Masters Championships. He holds multiple American and world age-group records in the sports of track & field and road racing, and he is a 5-time USA Masters Cross Country Runner of the Year.

“Pete Magill must have found the fountain of youth. I coach college students, and he consistently outruns half my team! He must know something the rest of us don’t!”

—**STEVE SCOTT**, Head Track Coach at Cal State San Marcos, 3-time Olympian, former American record-holder in the mile

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