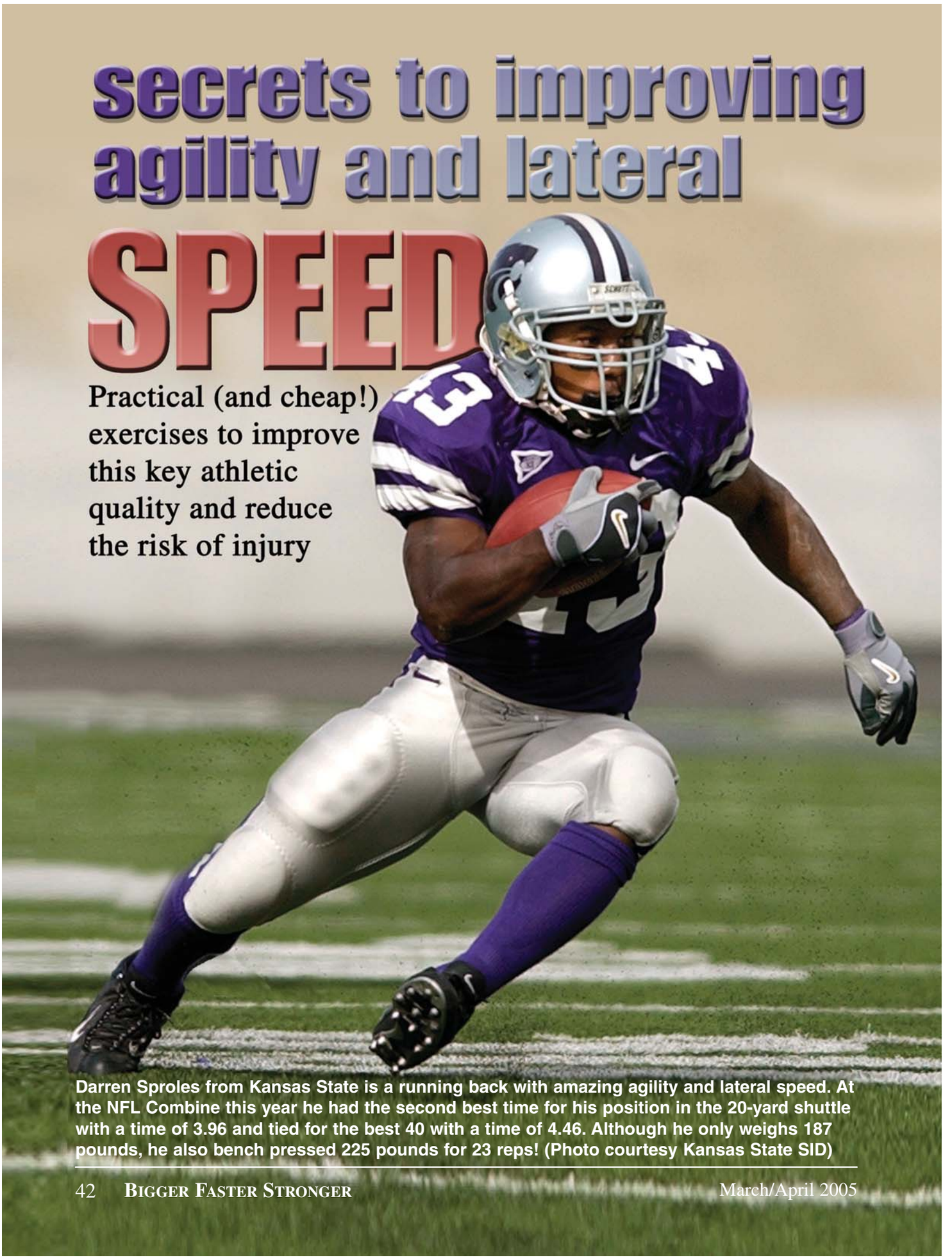
secrets to improving agility and lateral SPEED

Practical (and cheap!) exercises to improve this key athletic quality and reduce the risk of injury



Darren Sproles from Kansas State is a running back with amazing agility and lateral speed. At the NFL Combine this year he had the second best time for his position in the 20-yard shuttle with a time of 3.96 and tied for the best 40 with a time of 4.46. Although he only weighs 187 pounds, he also bench pressed 225 pounds for 23 reps! (Photo courtesy Kansas State SID)

by Kim Goss

Have you visited a fitness or sports trade show lately? Whether it's the latest wobble board, bungee cord apparatus or cable contraption, there's always some new training device being promoted as a surefire way to give athletes an edge.

But except for the possibility that some of this equipment can add much-needed color to dreary weightrooms, most of these high-priced toys offer very little value to an athletic training program.

One reason so many of these devices don't work is the same reason that Michael Jordan was a mediocre baseball player. One of the greatest basketball players ever, Jordan couldn't even stand out in minor league baseball. Certainly Jordan had great coordination, speed, explosiveness and jumping ability—physical qualities that would make him a good baseball player. But compared to his abilities in basketball, as a baseball player Michael Jordan tanked. Let me tell you why.

Baseball, especially batting, requires specific visual-motor skills. The parts of the brain responsible for these skills must be stimulated at a young age for these to fully develop into adulthood. This requirement also applies to language, music, art, dance and many other talents. Dr. Harold L. Klawans describes research to support this phenomenon in his book *Why Michael Couldn't Hit*. One of these studies, which was conducted by Edward Taub of the University of Alabama at Birmingham and two colleagues from Germany, used magnetic images of the brains of violinists.

"They found that those fiddlers who started playing early in life (age thirteen or younger) activated larger and more complex circuits in their brains than those who started learning to play their instrument later in life," says Klawans. "Those who hadn't started by thirteen never caught up. The circuits they activated were smaller, less complex, and more restricted. The time frame during which their brains could be guided to select those circuits had come and gone and left them forever without that ability."

This is not to say that sport skills cannot be improved in older athletes; it's just that abilities such as coordination are 90 percent established well before athletes enter adulthood. Further, athletic skills are sport specific. Sorry, but working on your golf game is not going to make you a better quarterback. And becoming a great swimmer is not going to improve your tennis game. Likewise, being able to juggle while balancing on a wobble board is probably only going to make you better at juggling while balancing on a wobble board—and amusing your friends at parties.

Other than playing the sport you want to be good at when you get older (which is why BFS encourages young athletes to play multiple sports), what is the best way to make athletes better? Well, you can start with the basics.

Get stronger with core lifts such as squats, and more powerful with Olympic lifting movements and plyometric drills such as box jumps. Perform auxiliary exercises that focus on the muscles emphasized in specific sports or areas of the body frequently injured. And stretch! But don't waste your time on gimmicks. To prove this point, and because this article promises to tell you secrets about improving lateral speed and agility, let's take a closer look at the slideboard.

The Case Against Slideboards

A popular so-called "functional" exercise, the slideboard is often used by strength coaches to help develop lateral speed, especially the ability to change directions (which some coaches refer to as lateral agility). It's also a favorite among sports medicine specialists to rehabilitate lower leg and ankle injuries.

The slideboard is, quite simply, a board with a slick surface. Most are about eight feet long, two feet wide, and have a two-inch tall "stopper" at each end to push off from and break your momentum at the end of your slide. For maximum slide, the user wears wool socks or special "booties" and may cover the surface with a light coat of wax. Although a top-of-the-line slideboard can cost as much as $300, you can make one for about $30 out of a large piece of linoleum. For a slideboard workout, you simply put on the booties or socks and slide laterally, using the outside edges of the feet to push off and stop. When you use the arms to help you slide, the motion looks very much like speedskating.

The angle of the slideboard (insert) places harmful shearing force across the knee when the foot hits the stoppers on each end. In contrast, the angles of the footboards on the BFS Plyo Ramp enables you to train lateral speed safely.

The individual most responsible for making us aware of slideboard training is Eric Heiden. Heiden, who won an unprecedented five gold medals in speedskating in the 1980 Olympics, attributed much of his record-breaking success to the slideboard. The slideboard was Heiden's "secret" weapon. Because slide training appeared to be low impact and fulfilled the requirements of a "functional closed-chain exercise" (an impressive-sounding description that is, in fact, nonsense), slideboards became a key fixture in many rehabilitation centers. But the claims about the value of slideboard training are based more on fallacies than on facts.

First, let's get one thing straight: Slideboard training is not biomechanically specific to skating. In a presentation made at the International Skating Union, a coach from Finland showed through EMG testing that the slideboard had the least specificity to the skating stride of the dryland training methods he examined. In fact, the muscles of the legs *are not* the primary muscles responsible for initiating lateral motion during slideboard training. According to the late sports scientist Mel Siff, PhD, the muscles of the trunk are the prime lateral initiators of movement during slideboard training.

As if being non-sport-specific weren't enough, slideboard training can place excessive, harmful stress on the knees. This is because having to stop at the ends of a slideboard can create excessive shearing force across the knee because of the angle of the foot. "If sudden changes of direction produce a twisting or tilting action of the knee, then the resulting torque can damage ligaments, capsule and inner structures of the knee, such as the menisci," said Siff. "Also, prolonged repetition of such lateral drills can lead to overtraining. Even fatigue and lack of focus produced by this type of monotonous activity can disrupt motor skill and lead to injury."

These precautions don't apply just to athletes. Paul Gagne is a Canadian strength coach whose has trained over 70 NHL players and two Olympic champions in figure skating. He said that at his former gym they had to cancel the slideboard classes because the found the activity was directly responsible for many hip and knee injuries. Likewise Charles Poliquin, who has trained over 400 Olympians including several world record holders in speed skating, says that he doesn't use slideboards because "they are damaging to the knee."

The lesson here is not so much that slideboards are pretty much a waste of money and may increase the risk of injury—although it's true—but that attempting to mimic athletic qualities such as lateral speed with sport-specific exercises usually doesn't work. Or at least the return in athletic performance isn't worth the time training with this equipment or the money it costs.

Becoming Great, One Leg at a Time

Back in the late '80s and early '90s when I was a strength coach at the Air Force Academy, one thing that puzzled me was why some football players who had great squatting ability had poor agility and lateral speed. Plyometric jumps on angled boxes helped, but I found that the *fastest* way to initially improve lateral speed was to have these athletes perform one-legged squats.

Think about it: When you're moving laterally or changing direction, you have to be able to control the forces your body is exposed to while supporting yourself on one leg. Often, these forces can be quite extreme. It's been estimated, for example, that the ground reaction forces in the lower extremities can be as much as five times bodyweight when a person drops from a height of just 12 inches. Similar forces occur when a football player or soccer player has to "brake" when changing direction on the field.

If an athlete does not have sufficient single-leg strength, he or she takes longer to stabilize their bodies so they can change direction. With all the cutting that takes place in athletics, especially in sports such as soccer and basketball, those fractions of a second can make the difference between winning, losing or even making the team.

In the area of injury prevention, single-leg strength also helps reduce stress on connective tissues by allowing for proper alignment of the foot, ankle and leg (i.e., toes aligned, knees aligned). Further, having good single-leg strength makes it more comfortable for an athlete to bend the knees. The result of doing deeper knee bends is less stress on the ACL and increased stability of the athlete.

A few athletes can perform single-leg squats the first time they try, but they are the exception. I've worked with figure skaters since 1988, many who competed in the Olympic Games, and even within this elite class of athletes it was rare to find athletes who could perform the exercise properly. However, I found I could often create rapid improvements in the ability of a skater to land jumps simply by having them perform single-leg squats. With that sales pitch, here is a progression to use in performing this exercise.

Single-Leg Squat, Assisted. This exercise is the easiest variation of the single-leg squat and requires the assistance of a partner who will spot you. You'll need to stand on a sturdy box, preferably one that has a base broader than its top (such as a BFS Plyo Box), as this design is more stable. Without the box, you have to keep one leg elevated throughout the entire exercise, which can be quite challenging and detracts from your concentration.

Stand on the edge of a sturdy box and let the outside leg rest in open space. The spotter will stand at your side, place one hand on your wrist and the other hand just above the elbow as shown. Keeping the knee of the working leg in line with the long toe,

squat down as low as possible without buckling the knee. Keep the foot of the working leg flat—don't allow the heel to rise. As athletes become stronger and more stable, less assistance is required. After a few workouts most athletes will be able to do a rock-bottom, single-leg squat with little assistance.

SINGLE-LEG SQUAT, SELF-ASSISTED. This variation, which I learned from BFS president Bob Rowbotham, is the next step in single-leg squatting. It is recommended only after the athlete can perform a full, assisted single-leg squat with very little help from the spotter. Stand on the edge of a study box and let the outside leg rest in open space. Keep the heel of the other foot flat on the box and the knee in line with the long toe. Now press the free leg against the side of the box to create friction between your foot and the box. This friction increases your stability

and helps slow the descent. Keep the foot of the working leg flat—don't allow the heel to rise. Go as low as comfortable while maintaining perfect knee alignment.

SINGLE-LEG SQUAT. You're ready for this exercise when you can perform a full, self-assisted single-leg squat. Stand on a sturdy box and let the outside leg rest in open space. Keeping the knee in line with the long toe, squat down as low as possible without the knee buckling. Keep the foot of the working leg flat—don't allow the heel to rise. After a few weeks most athletes will be able to perform a rock-bottom, single-leg squat with perfect form.

SINGLE-LEG SQUAT, WEIGHTED. Soon the single-leg squat with just bodyweight will become too easy. Just increase resistance by holding a weight in front of you at arms' length. You can start with a medicine ball; but as you get stronger, you may need to switch to a weight plate or a dumbbell. If your knee starts to buckle, the weight is too heavy.

Although you could perform single-leg squats while standing on a wobble board, this is an advanced exercise and carries a higher degree of risk. Also, wobble boards do not necessarily duplicate the athlete's activities on the playing field. With a wobble board the foot essentially rotates around the lower leg, whereas in athletics the playing field is flat so that the lower leg rotates around the foot. And there are other reasons to avoid wobble boards.

Dr. Michael Ripley has worked with dozens of male and female athletes who have won medals in sprinting at the last two Olympic Games. Ripley says that most athletes, especially beginners, should avoid wobble board exercises. "Exercises on wobble boards are often too advanced, even for the world-class athletes I work with, because few athletes are structurally sound in their trunk and lower extremities. It's better to work on a flat, stable surface because for most athletes performing these exercises of a wobble board could place excessive, harmful stress on the joints and connective tissues."

If you're on the BFS program, you can perform single-leg squats as an auxiliary lift, or do a few sets after your plyo workouts on the Tuesday/Thursday workout. Whatever you choose, it takes only a few minutes and reaps great benefits. If you're using the BFS program, follow the guidelines for auxiliary lifts. Two sets of 10 reps will create tremendous improvements—if you perform fewer reps, more sets would be needed. But the main idea is that the single-leg squat is simply a great auxiliary lift. Build overall strength with core lifts such as squats, exercises in which heavier weights can be used to create greater tension on the muscles and therefore higher strength training effect.

Occam's razor is a principle that states that the simplest answer is generally the best, and the idea hold true in this case. There are always new, colorful exercise gimmicks, but they're usually not all that great for improving athletic performance and may even increase the risk of injury. For the most bang for the buck, you simply can't beat the single-leg squat for improving lateral speed. And hey, if your weightroom lacks color, try paint! BFS

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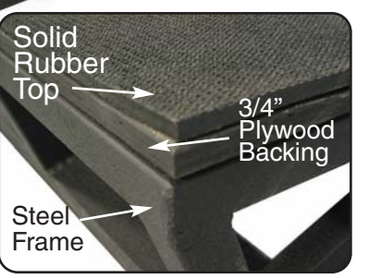

DRILLS 1 & 2: Right & Left

DRILL 3: Up & Back

TRAINING TIP

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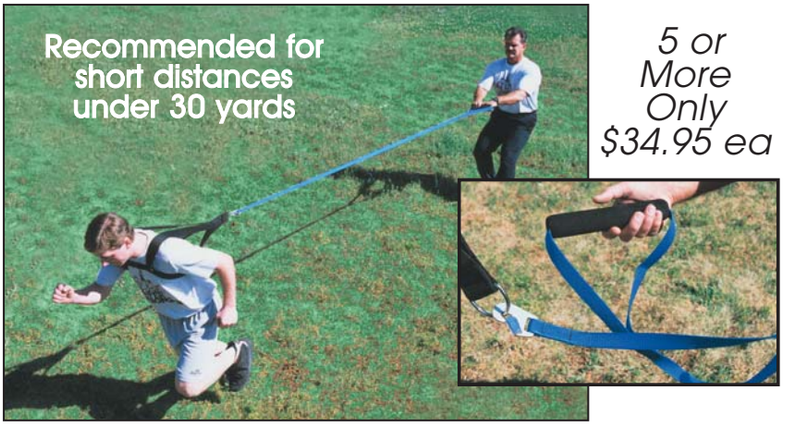

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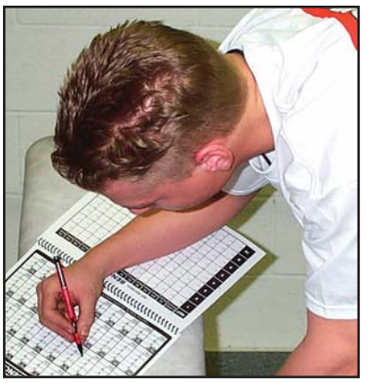

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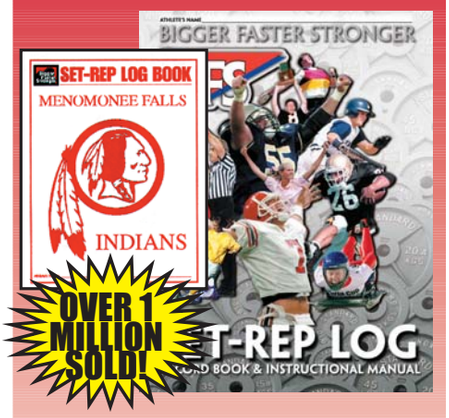

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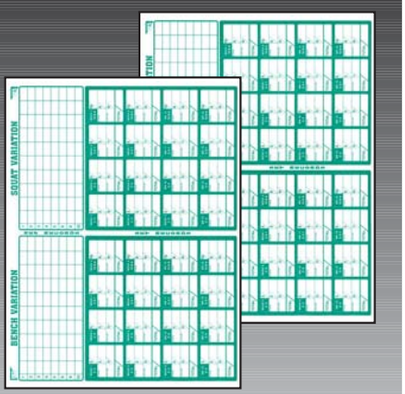

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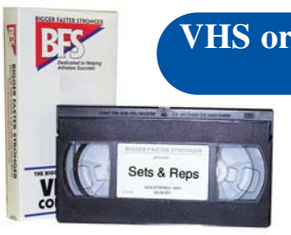

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