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How to Pick the Right Putter

Putting boils down to getting aim right, tracing the correct path and dialing in the right speed. There's a feel element to nailing these factors for sure, but when the putter in your hands matches the way your eyes see putts, it all comes together as if by magic.



The Master Fitter David Edel

PGA teaching professional and club manufacturer, Edel Golf, Liberty Hill, Tex.

The creator of the most advanced putter-fitting system in the world has over 16 million ways to build you the perfect putter, and proves to you that when it comes down to solving the mysteries of putting, the arrow—not necessarily the Indian—is getting in the way.

WHY IS IT THAT some players putt the lights out without giving their stroke anything but a passing thought, while others have to gnash their teeth to sink the simplest four-footer? It took me 14 years of researching and building putters to finally come up with a solid answer: *good putters putt with the right gear.*

I'm sure the putter that's currently in your bag is a fine flatstick, but is it absolutely the right one for you, and how would you know if it was or it wasn't? When you went to purchase it you were obviously

swayed by its looks, or by the fact that your favorite Tour pro endorsed it. Either way it was a hasty decision, and not once did you ask about the head weight or grip options, nor inquire about the loft. I'm also willing to bet that you didn't carefully examine the head shape or the hosel design, or whether the putter was face-balanced or toe-weighted. These are more than just add-ons, like the sport package option on a new car. Design elements such as these are fundamental to the way any putter performs and, more important, how it reacts to your senses and stroke.

The industry wants you to believe that redemption lies at the nearest pro shop. I'll prove to you that redemption lies with *you*, and how the right combination of putter design elements can help you see the line in a whole new light—the perfect line from the ball to the hole.

5 Things I'll Teach You In This Chapter

1 Why putting is an enigma—and how finding the right putter can solve it.

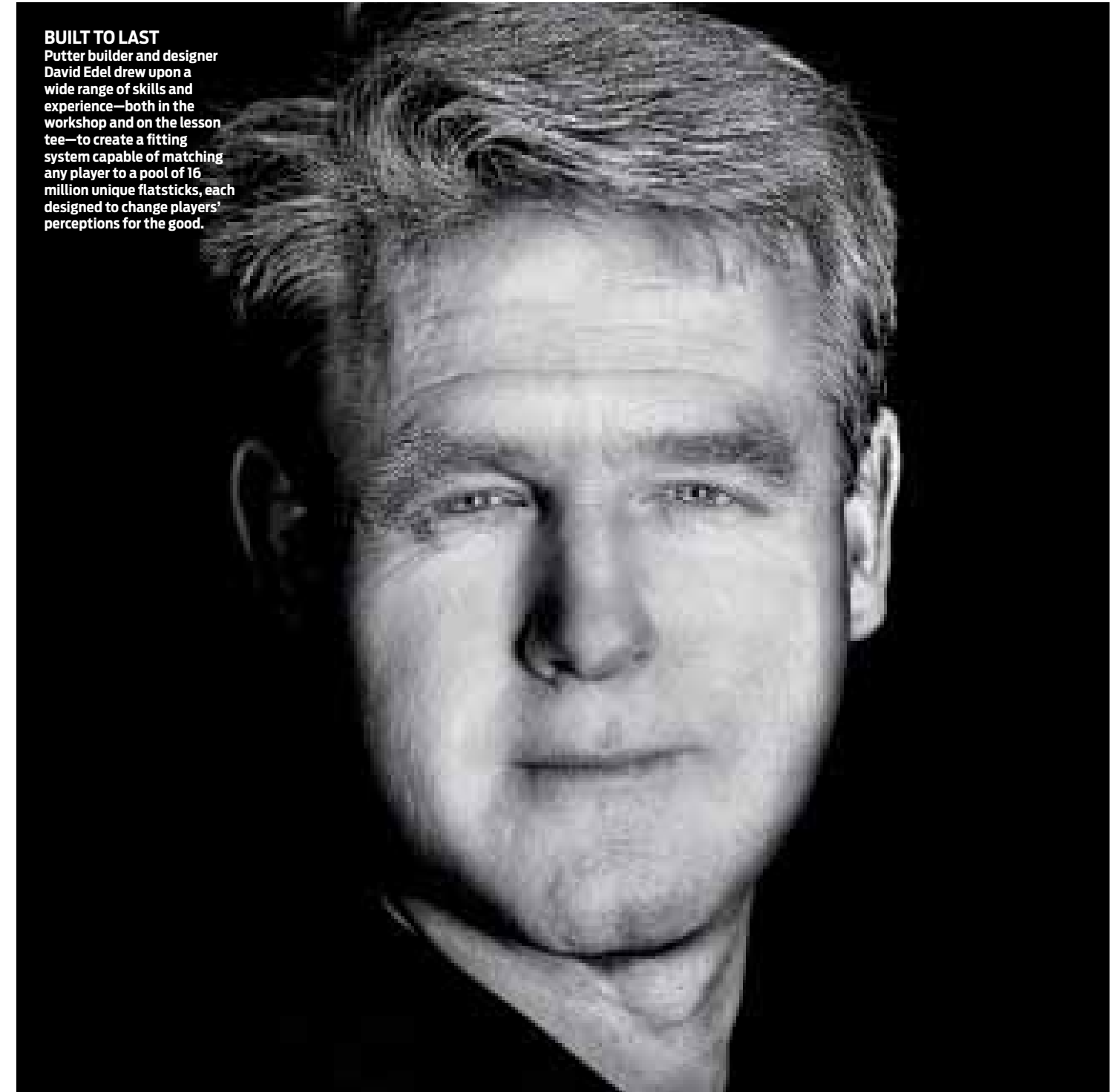
2 The three components to successful putting and how you can master them with a simple putter change.

3 How key design elements such as hosel and head shape affect your ability to aim.

4 How to enhance your touch and feel on the greens by changing the weight distribution in your putter.

5 The link between your putter's design, your perception of the line and green reading.

BUILT TO LAST
Putter builder and designer David Edel drew upon a wide range of skills and experience—both in the workshop and on the lesson tee—to create a fitting system capable of matching any player to a pool of 16 million unique flatsticks, each designed to change players' perceptions for the good.



ALL ABOUT ME

Name: David Edel
Where you can find me: Edel Golf, Liberty Hill, Tex.
Teaching since: 19TK
Where I played: TK
Where I've taught: TK
Who I've built putters for: TK
Awards I've won: (TK)
My best contribution to the game: TK
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ASK ANY OF the golfers you know—even yourself—what makes a putter a good putter and the concept of “feel” will almost certainly be broached, although nobody can ever seem to define it. Is it how soft the grip feels, or the sound the putter makes, or its weight or loft? What about the shaft, head style, aiming lines or the hosel? Never before has a golf termed been used with such frequency without anyone knowing really what it means.

My teacher, Ben Doyle, taught me early in my career that to be successful at anything you had to be able to define and sustain its core principle. He used the example of a boat: what is it? The core principle of any boat, he said, is buoyancy. That’s it. If you can make it float, you’ve made a successful boat.

So the million-dollar question: What’s the core principle of feel? My studies show that it’s a combination of three factors: aim, path and speed control. Every decision you make on every putt is based on these three factors, and they’re tightly interrelated—if you try something different in your aim you’re going to get something new with your speed and path. That’s why I call it the Putting Triad. For example, let’s say you typically aim left of your target (many people do). Over the years you’ve learned to compensate for your left-aim bias by opening the putterface or cutting across the ball at impact. Then, you suddenly learn how to aim

WATCH & LEARN



When you see this icon go to golf.com/bestputtingbook for a free video lesson with David Edel.

“Certain head shapes, hosels, aim lines, shaft lengths and other design variables promote different patterns of aim.”

straight. Good for you, but now your path and speed don’t match your aim. You’re going to miss right if you don’t change the other parts of the Triad.

The most important thing to know about the Putting Triad—and to fully grasp the core principle of putting and feel—is that it’s dominated by aim. Aim is step one to becoming a great putter. It’s the reason why you stroke putts a certain way (like in the left-aim bias example above). Your mind senses where you aim and makes the necessary adjustments.

A lot of what you’ll read in this book deals with improving your aim, but it won’t mean a thing unless you have a putter that allows you to. I began making putters 14 years ago for Henry Griffitts, and helped develop their fitting system with fellow professional Chris Aoaki. During the process we discovered that the physical makeup of a putter created aim bias. In other words, certain head shapes, hosels, aim lines, shaft lengths and other design variables promoted different patterns of aim—left, straight and right. Thus, we built a system to test and evaluate different combinations of components to create consistent aim patterns in individual players. I’ve recently adapted these principles to my own company, Edel Golf, where we have the ability to build 16 million different putters with various component combinations to enhance aim and performance. While it may be hard for you to believe that a few extra grams of head weight or a hosel swap are the difference between a make and a miss, it’s nonetheless true—a fact you’ll come to accept as you learn more about the different components and their effects on the Triad.

THE PUTTING TRIAD

1. Consists of aim, path and speed control.
2. Aim is the dominant member of the Triad, and you can aim correctly only if the putter in your hands features design variables that allows you to.

AIM OF THE GAME
 Putting success is determined by your aim, path and speed. The most important of these is aim, which you can master only if you have the right putter.



AIM IS KING

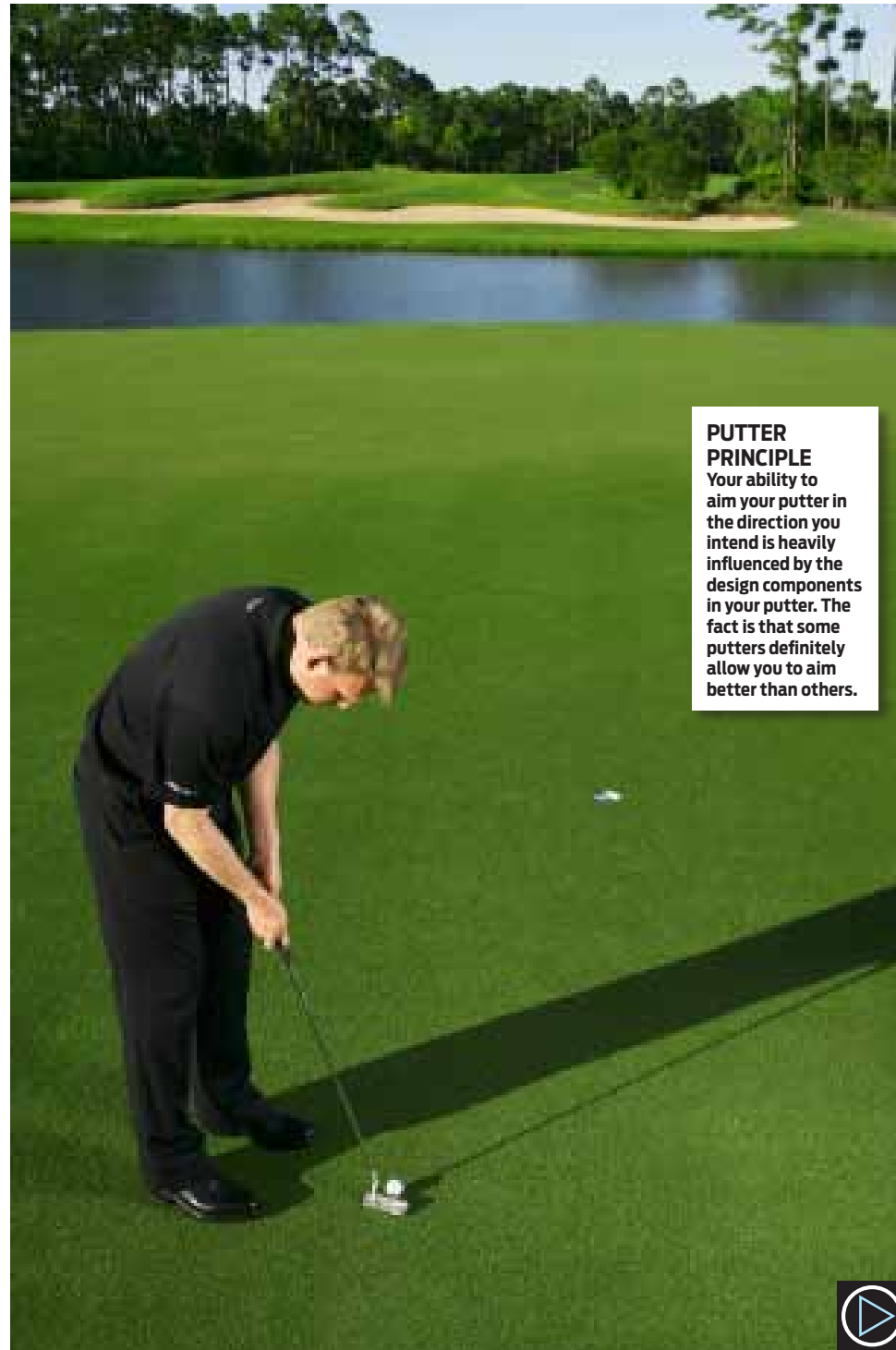
DESPITE THE GLUT of putting instruction articles and training aids that deal with stroke path and acceleration, the direction your putts travel is primarily determined by the putterface and where it's pointed. That's an easy enough concept to get one's head around—the ball goes where the face goes. But there's more to aim than pointing the face left, right or center. Aim is also a vertical concept. Not only do you have to aim the putter in the right direction laterally, but also up and down.

GAUGE YOUR PERSPECTIVE

If you have the chance, set up to putt to a mark on a wall about three-quarters of an inch above the floor. Make it from 12 feet or so. Then, have a friend attach a laser to your putterface (you can pick one up at any pro shop) and see where it points. A wide majority of golfers will not only miss the mark to the left or the right, but also above and below. They miss in two dimensions. They miss laterally because they're pointing the face left or right of where they think they're aiming, and above and below because a) they're not aware of the exact amount of loft in the putterface, or b) they set their hands ahead or behind the putterface, which tilts the entire head up and down.

Nearly everyone fails this test because most golfers don't give any thought to the various design elements built into their putter and how these elements affect aim. Putters aren't just putters. They're a conglomeration of complex shapes, curves and angles—visuals that your eyes have to sort out in order to point everything in the right direction. Your eyes can't do it if any of these shapes don't look good to

“Not only do you have to aim the putter in the right direction laterally, but also up and down.”



PUTTER PRINCIPLE
Your ability to aim your putter in the direction you intend is heavily influenced by the design components in your putter. The fact is that some putters definitely allow you to aim better than others.



you or inhibit your perspective. Since golfers aren't fully aware of this fact (evidenced by the fact that 90 percent of the players I test can't aim straight on a six-foot putt), they make compensations in their strokes—again, altering each segment of the Triad in a desperate attempt to get the ball in the hole.

CUSTOMIZING YOUR PERSPECTIVE

The laser test mentioned above is the first step of my fitting process. The test I use is a bit more sophisticated, but the same principle applies [see panel, right]. Once I know a player's aim bias (up and left, down and right, etc) I start manipulating the angles, lines and curves in their putter until they match their eye. I do this with a proprietary system that allows me to change 10 key putter design variables with what amounts to a simple turn of an Allen wrench. Each one of these variables affects your perception of where you're aiming the putterface. It sounds crazy, but it's true—a putterhead with two aiming lines will cause you to aim differently than one with three, and an S-shaped hosel gives you a totally different perspective than an L-shaped hosel. These aren't new discoveries—we've known about them for the better part of 14 years. I'm sure you've heard the story about bad habits and them being hard to break.

While there are many design variables that go into every putter and which affect your visual aim, we'll cover the primary pieces in this chapter to give you a solid understanding of how each and every one changes your perspective and each component of the Triad. Armed with this knowledge you'll be well on your way to making much more informed purchasing decisions and aiming your put-

AIM MODIFIERS

HOSEL
LIE ANGLE
HEAD SHAPE
LOFT
LINES
LENGTH
GRIP TYPE

SPEED MODIFIERS

HOSEL
HEAD WEIGHT
COUNTER WT.
SHAFT FLEX

AIM TEST

Aiming is a multi-dimensional concept: there's a left/right component and an up/down component. I assess a player's aim by reflecting a laser beam off a mirror that I attach to the player's putterface. This allows me to pinpoint both the vertical and horizontal aim tendencies. Nearly everyone mis-aims in both dimensions, but they can improve aim by swapping putter components that confuse their eyes for ones the look good to them.



STEP 1

I point a laser beam at a ball and have the student aim the putterface back at the laser. With perfect aim, the mirror on the putterface should reflect the laser back to its origin.



STEP 2

Once the student is comfortable with his aim I remove the ball. In most cases, the rebound of the laser off the mirror misses the target to the left or right as well above or below (a backboard behind the laser shows exactly where the putterface is aimed).

AIM MODIFIER #1: THE HOSEL

THERE ARE A number of putter models where the shaft dives straight into the head, but most of the putters you'll see on the market feature a distinct hosel—that funny-shaped connecting piece between the end of the shaft and the putterhead. Hosel type has a lot to do with the overall balance of your putter. Certain shapes create face balancing and varying degrees of toe hang—design traits that are easy to pick up (just balance a putter on your index finger just above the hosel to see how it's weighted). What isn't so concrete is the effect different hosel types have on your perspective and aim. As it is with all of the putter design variables that we'll discuss in this chapter, the shape of the hosel has a definite influence on your ability to point the putterface in the direction you intend.

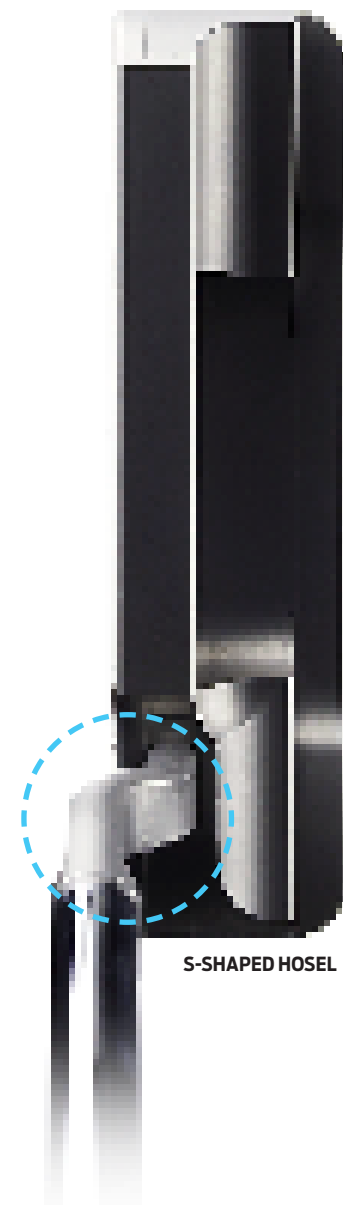
The easiest way to survey any hosel is to break it down by shape (usually, S shaped or L shaped) and by offset (usually, 0 to 0.5 inches). Hosel offset and shape produce optical geometries that create aim responses in your subconscious. Some tend to aim you more to the left and some tend to aim you more to the right. The critical word here is "more"—a certain hosel may aim you more right or more left, but not necessarily right or left of dead center. The hosel is the only putter component that we'll discuss that doesn't seal the deal in and of itself. Also notice that I used the word "tend" because everyone is wired differently.

That being said, here are some general rules that hold true for the majority of players:

1. L-SHAPED HOSELS (also known as plumber-necks) tend to create more of a leftward aim bias than their S-shaped counterparts.

2. HOSELS THAT FEATURE OFFSET tend to aim players more to the left. It's a progressive relationship; the greater the offset the greater the left-aim bias.

3. ONSET HOSELS (those that set the putterface ahead of the shaft) tend to aim people more to the right.



PICK YOUR HOSEL

Check the hosel designs on these pages (as well the view you get with each one when you stand over the ball). Even though these are simple photographic representations, you should be able to sense how your perspective changes with each one. My fitting system uses five S-shaped hosels and six L-shaped hosels (I machine an L-shaped hosel with a forward shaft insert that isn't pictured here) with varying offset to create 11 unique views at address.



NOTE If a person uses a putter with a lot of offset but tends to aim right, giving him a putter with zero offset will most likely change his aim bias to the left. Like I mentioned previously, every player is wired differently. We never know how a player will respond until we test them using the laser and take a full inventory of their current putter preferences.

S-SHAPED HOSELS (slant necks)

Offset created with curved rather than straight angles. As the offset increases, so does the tendency to aim more to the left.



L-SHAPED HOSELS (plumber necks)

Offset created with the addition of a 90-degree bend in the hosel. Because of the straight lines designed into these hosels, L-shaped necks tend to aim players more to the left.



AIM MODIFIER #2: LIE ANGLE

LIKE YOUR IRONS, wedges and woods, your putter is built with a specific lie—the angle that shaft makes as it enters the hosel measured from the ground. Most off-the-rack putters are built with around 70 degrees of lie.

Lie angle has a lot to do with putter aim—the manner in which it combines with the loft of your putterface and the overall length of the shaft can drastically alter your perspective. The best example to help explain how lie affects aim is when the putter is too upright. Most players compensate for too much lie by simply dropping their hands, a move that causes the toe of the putter to rise off the ground. I’m sure you know of someone who putts this way. This toe-up position almost always forces players to aim more to the left. It’s the same phenomenon as setting up to the ball on a sidehill lie with the ball above your feet. The ground, lie angle and loft automatically change the clubface position and point it to the left. That’s why you’re told to aim out to the right on these shots because they naturally want to fly to the left.



“The manner in which lie combines with loft and shaft length can drastically alter your perspective.”

LIE ANGLE
Defined as the angle the shaft makes with the ground. Upright lies tend to aim you more to the left; flat lies tend to aim you more to the right.



AIM MODIFIER #3: HEAD SHAPE

IF YOU WALK into any pro shop there’s a good chance that the sheer number of head designs will overwhelm you. You’d think that there were at least as many head designs as there are golfers. But when it comes down to looking at head shapes and their affect on aim and the other factors in the Triad, you can easily pare down the offerings into just a few discernable shapes.

At one end of the spectrum are large, mallet shaped putters, like the popular Odyssey 2-Ball putters. At the other end are your standard heel-toe putters, like the PING Anser. Every other putter is a deviation of these two models. The primary difference between the two ends

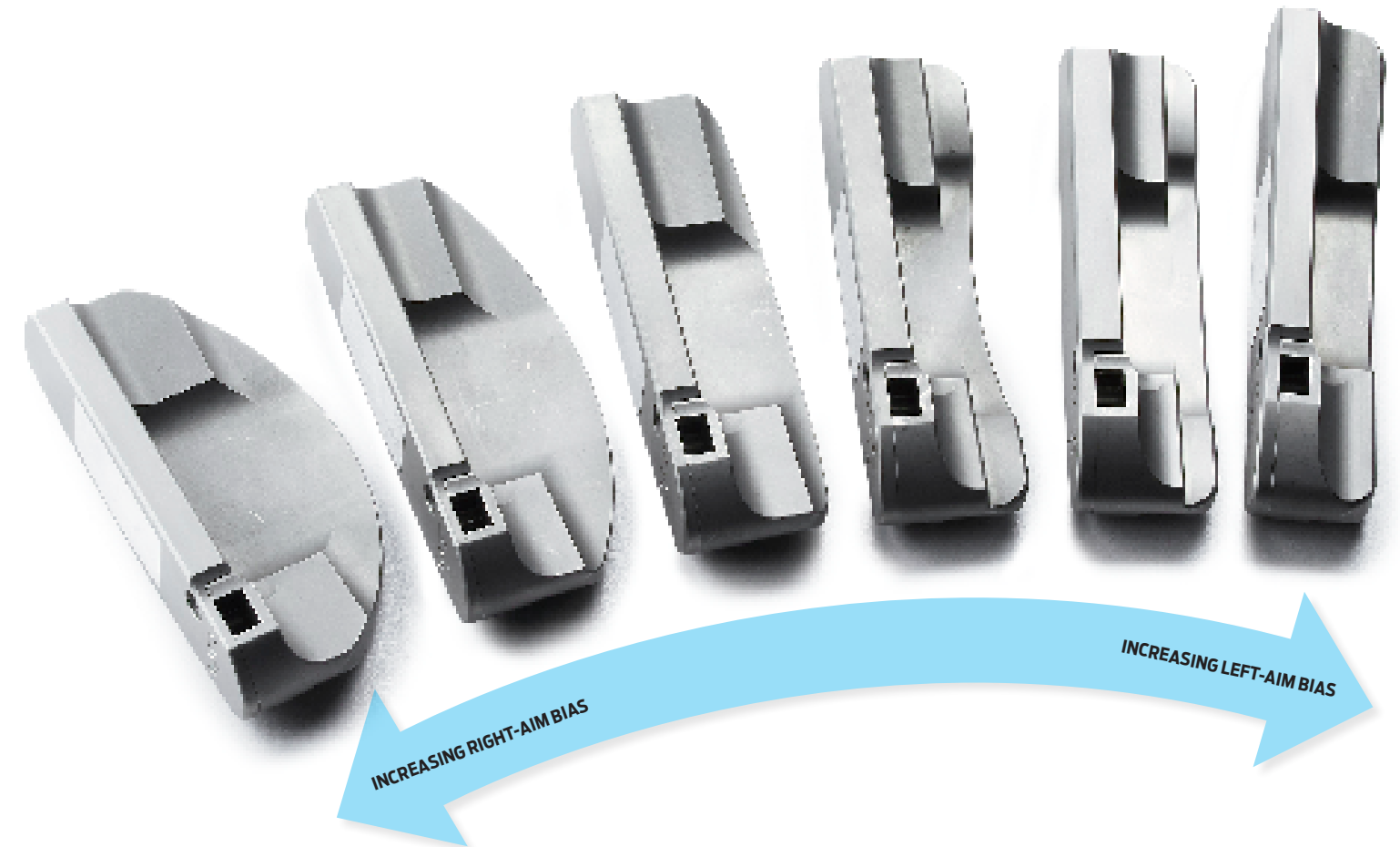
of the spectrum, other than size, is the geometry in the back. Mallets tend to have curved trailing edges; blades and Anser-style putters tend to feature straight back edges with a lot of parallel lines built into the head. The back geometry of any head shape is the secret to its effect on aim. Here are some general rules:

- 1. The more circular the putter’s trailing edge, the more likely it will cause you to aim more to the right.**
- 2. The straighter the putter’s trailing edge, the more likely it will cause you to aim more to the left.**

Much of this aim bias is based on where a putter forces you to look when you’re setting up at address. Because a mallet features a circular back, you have to look to the leading edge to set the face perpendicular to your target line. With an Anser-style putter you can use either the back edge or the lead edge since both are parallel.

SHAPE SHIFTS

When surveying any putterhead, look to the back edge. The greater the curve built into the trail edge, the more likely that putter will cause you to aim more to the right.



AIM MODIFIER #4: LOFT

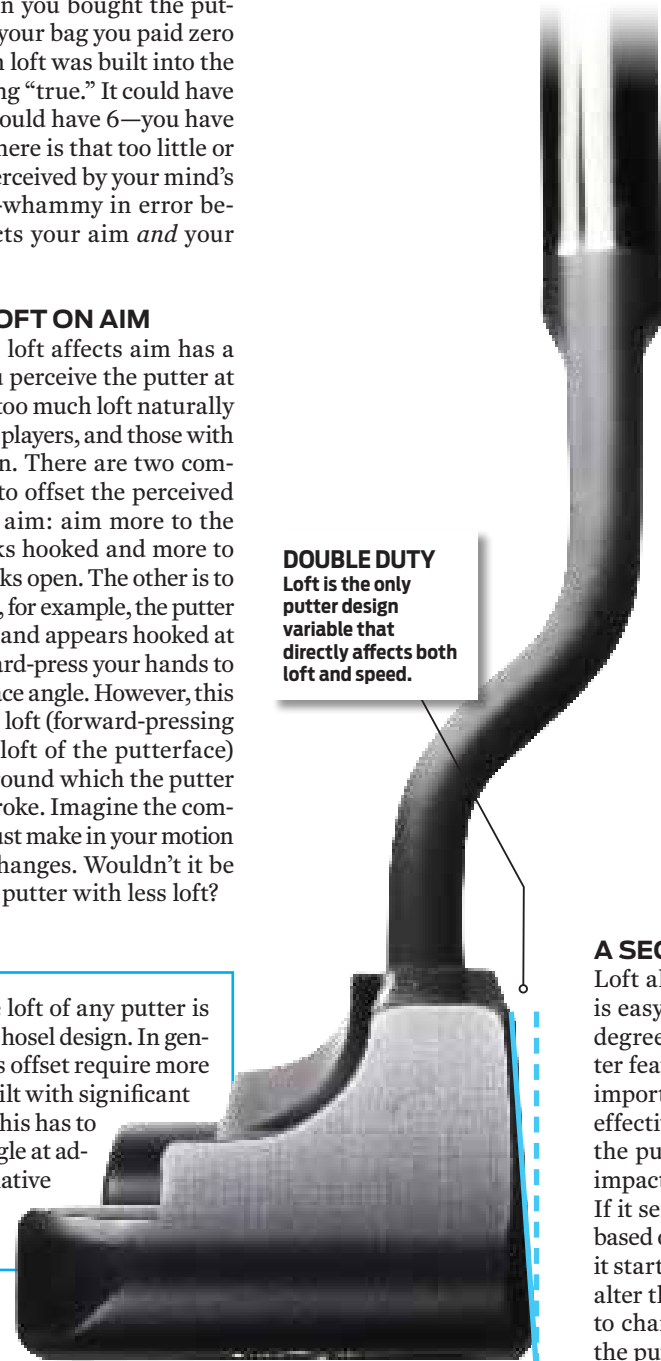
TRUE OR FALSE: When you bought the putter that's currently in your bag you paid zero attention to how much loft was built into the putterface. I'm guessing "true." It could have 3 degrees of loft or it could have 6—you have no idea. The problem here is that too little or too much loft, as it's perceived by your mind's eye—causes a double-whammy in error because it directly affects your aim *and* your speed.

THE EFFECT OF LOFT ON AIM

The manner in which loft affects aim has a lot to do with how you perceive the putter at address. Putter with too much loft naturally appear hooked to most players, and those with too little loft look open. There are two commonly used methods to offset the perceived look. One is to adjust aim: aim more to the right if the putter looks hooked and more to the left if the putter looks open. The other is to adjust hand position. If, for example, the putter features too much loft and appears hooked at address, you can forward-press your hands to correct the perceived face angle. However, this move also changes the loft (forward-pressing reduces the effective loft of the putterface) and shifts the point around which the putter rotates during your stroke. Imagine the compensations you now must make in your motion to offset this glut of changes. Wouldn't it be better to simply buy a putter with less loft?

DOUBLE DUTY
Loft is the only putter design variable that directly affects both loft and speed.

NOTE: The effective loft of any putter is tightly related to the hosel design. In general, hosels with less offset require more loft, while hosels built with significant offset require less. This has to do with the shaft angle at address and impact relative to where the hosel positions the head.



OPEN LOOK
As loft decreases, the more open the face looks at address.

HOOKED LOOK
As loft increases, so does your perception that the face is hooked (pointing to the left).

A SECONDARY EFFECT: SPEED

Loft also influences the speed of your putts. The base effect is easy to understand: a ball struck with a putter built with 1 degree of loft will travel further than one struck with a putter featuring 5 degrees of loft with the same stroke. The more important effect is a little tougher to grasp, and has to do with effective loft (the true loft of the club plus the angle at which the putter ascends into the ball). As your putter approaches impact your mind is subconsciously calculating effective loft. If it senses that your putterface has too much or too little loft based on the roll distance it computed when you made your read, it starts making adjustments. Since your mind can't magically alter the shape of your putterhead, it manipulates your stroke to change the ascent angle and get the effective loft it thinks the putt needs. This, obviously, is a slippery slope.

AIM MODIFIER #5: LINES

THE LINES DRAWN on your putterhead are also critical to the aim scenario. Most people assume that you need to have lines on the putter, and that lines ensure that you'll aim straight. We see them on airstrips, highways, railway lines and race tracks, and it makes sense that we think that they're helpful. However, lines can exert both positive and negative effects depending on how your eyes interpret them. Not only is it a question of whether or not to have aim lines, but also where they should be placed and how many be used.

We created a line template as part of our fitting system that allows us to easily test line arrangements and gauge aiming ability. The results are incredible. Here's a quick recap:

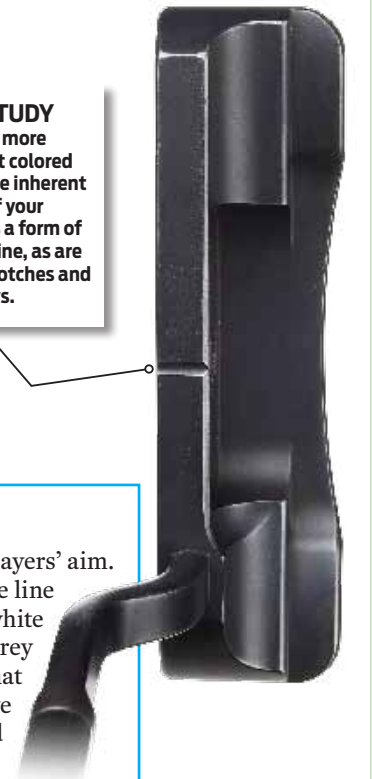
1. Lines, in general aim, tend to make people aim left.
2. The further back the lines the more they will tend to aim you left.
3. Lines near the toe of the putterhead influence aim less than those placed nearer the heel.
4. An absence of lines tends to create a right aim bias.

The reason for these biases is that lines and the way they're patterned affect which part of the putter you look at. If there are more lines on the back cavity than on the leading edge, you're more likely to look at the back cavity. If there are more lines on the topline than then the back cavity, your attention will be drawn to the front of the putter, changing your perspective of the hosel, the putterhead—everything. Most people are drawn to things that look busier on a conscious level because they assume that those markings are there for a beneficial reason, but on a subconscious level they can confuse—your mind sees them as just another series of inputs it needs to sort out.

NOTES ON COLOR

Our line study also proved that the color of the lines affects players' aim. A grey putter with a black line and a black putter with a white line create different aim values, all other things being equal. A white line on a black putter is more evident than a black line on a grey putter. Green and red lines affect aim differently than those that are blue or yellow. Colors mean a lot to people and they can have negative, positive, and neutral associations with them, so it would make sense that they would affect how people value them.

LINE STUDY
Look for more than just colored lines. The inherent shape of your putter is a form of aiming line, as are milled notches and cutaways.



SPEED MODIFIERS

SO FAR YOU'VE learned how different putter design components can affect your ability to point your putter correctly at your target. (There are a few other components that affect aim which we didn't discuss, namely shaft length, shaft flex, grip type and grip size. If you're interested in learning more about these components, then visit www.edelgolf.com.) But what about the other elements of the Triad? As you can guess, the physical makeup of your putter also influences your speed and path.

Without getting into the techniques and concepts of how to produce better speed, I'll show you how putter design variables affect your ability to control it. As with most of the concepts discussed thus far this isn't a one-sided affair. Really, when I talk about speed control I'm dealing with several variables that change your sense of touch and feel.

THE NOTION OF SCALES

Have you ever thought of your hands as pressure scales? Probably not, but if you think about it, it makes sense. Our hands can sense hot and cold, smooth and rough. They can also sense weight.

When you grab something you don't immediately grab it with maximum force. You use just enough effort to lift it. If your hands then sense that the object is heavy, they'll increase the pressure. If your hands sense that the object is very heavy, then your body starts a complex reaction to ready and activate other muscles in your arms and torso—your legs if need be—to complete the task. All this happens, however, in relation to the sensory input provided by your hands when they first lifted the object. Over time you program how much effort you need to lift certain objects, which is why you never have to think too much about the amount of energy you need to lift most items.

When you putt, the same scenario applies—your fingers and hands are the primary source for information transfer. As you make your putting stroke the stresses of the motion create load patterns in your hands. The load patterns inform your hands if the motion is too quick

or too slow and, in nanoseconds, your body adjusts (i.e., hits the brakes or steps on the gas). This is about as close to an explanation of “feel” as you're ever going to get—a biomechanical sense of load and pressure. Over the years you've programmed the energy you need to hit putts of certain lengths (just like you learned how much pressure to use to lift everyday items), but as you're about to discover this program rarely works because the conditions affecting your putt, namely green speed, are constantly changing.

“There are ways to manipulate the weight of your putter to generate the same feel and control speed on any type of green.”

HOW WEIGHT CONTROLS SPEED

Now that you know your hands receive pressure, and your brain computes a value to this pressure for a given activity, you can start to move forward with the idea that the physical makeup of your putter can affect your ability to control the speed of your putts.

Let's assume that you're a golfer that typically plays on greens that roll around 9 on a Stimpmeter (a solid average on most of the courses you'll play). Today, however, you're playing on greens that roll 11. You can guess what happens. You send your first few putts screaming past the hole, then get tentative and start coming up way short. By the time you reach the seventh hole you haven't come close to sinking a putt, the psychological bombs are detonating in your head and you haven't a clue what to do.

This is where weight comes into play, and the reason for all this talk of scales. Golfers have difficulty controlling the speed of their putts because they haven't learned to outsmart their feel senses to get what they want. In other words, there are ways to manipulate the weight component of your putter to generate the same feel and control speed on any type of green—fast, slow, whatever. The trick is to make your hands sense more weight or less weight than they expect so they relay new information to your brain, which then tells your body to move the putter faster or slower than what you have already programmed. Viola!—instant speed control.

Here's an easy way to understand how the system works. Pick a spot 10 feet in front of you. Imagine tossing a ping-pong ball to that spot. Now, toss a bowling ball with the same force you used with the ping-pong ball. The bowling ball travels less not because of a change in force or velocity, but rather because of a change in weight.

This explains why, if you're old enough to remember, pros used to add or remove lead tape from their putters before play. If they didn't have enough practice time to adjust their previously programmed strokes to the pace of that day's greens, they'd make their putter heavier or lighter to force their hands to adjust for them.

ALTERING WEIGHT FOR YOUR GOOD

Manipulating weight is the fast track to nailing the speed part of Putting Triad. There's more to it, however, than simply beefing up the gram weight in the head. Weighting covers a variety of putter-design properties, including counterweighting (adding weight to the grip end of the shaft) and, believe it or not, shaft flex. It's important to fine tune these variables so that they can work with your natural touch system. Trust me—there's a system to dialing in these components. Once you become familiar with the system on the following pages you'll see that the problems you've had controlling the speed and distance you hit your putts haven't been your fault at all.

SPEED CONTROL
If you have difficulty controlling how far you hit your putts, then you're in need of a head weight change or a different shaft flex.



SPEED MODIFIER #1: HEAD WEIGHT

HEAD WEIGHT IS exactly what you think it is—how much does that puppy weigh? The best overall head weight for you is the one that matches the speed of the majority of greens you play (i.e., those at your home course or your most frequently played muni). If, however, you tend to play a number of different courses, then your best putter is one that allows you to easily add weight or remove it, since you're going to experience several different green speeds over the course of a year and you'll need the ability to adjust. (Keep in mind that as the seasons change, so do the conditions of the greens, so even if you play the same course over and over you may benefit from an adjustable-weight putter).

As a rule, you should use a lighter putter (less than **TK** grams) on slow greens and a heavier putter (more than **TK** grams) on fast greens. I know it makes sense that you'd do just the opposite since a heavier putter transfers more energy to the ball than a lighter one with the same stroke, and that's the last thing you want on fast greens. It doesn't work that way, however. Your hands sense that the putter is heavy and, therefore, will swing it with less effort.

If you remember your high school physics you'll recall the formula $E=MV^2$. It's the equation for Energy, which is equal to the Mass of the object multiplied by the square of its Velocity. Regardless of the grade you received in physics, it's easy to see just by looking at the formula that velocity has a much greater influence on energy than mass.

GETTING THE WEIGHT RIGHT

So how do you figure out how to get the weight right in your putterhead? Simple, tack a piece of string on the putting green, set up 10 feet away from it on level ground and roll a few putts toward it [photo, right]. If you hit most of the putts long and short of the string, then you know that you lack the touch to control distance with the weight built into your put-



WEIGHT WATCHER
The addition or removal of weight from the head is key to dialing in the correct speed on the greens you typically play.

ter. I guarantee that if you change the weight, you'd fine-tune your distance control and hit the string every time. If you hit most of your putts beyond the string your putter is too light. You're moving it too fast because your hands sense the lack of weight. If the majority of your putts stop short of the string, then your putter is too heavy. You're moving it too slow because your hands sense too much weight. Remember, velocity has a greater effect on energy than mass.

Of course, some golfers hit putts farther with a heavy putter and some hit putts shorter with a lighter putter, but not because of the weight. When you putt with a putter that's too heavy for your senses, it starts off moving at a slower pace as discussed. What can and very often happens is that your brain picks up on the movement and sends the message to accelerate. The acceleration, however, happens too quickly, too late and at too rapid a pace—you jab at the ball (can you say “yips?”). The opposite can and often happens when you swing a putter that's too light. This time, once your brain senses that the putter is moving too fast (because your hands sense the lighter weight), it dumps the power and you decelerate—a very common and serious error.

The key is to experiment with the string drill using putters of various weight (I'm sure your local pro shop has a row of differently weighted putters and a practice putting mat—take advantage of it). My fitting system allows me to change the weight in the head up to **TK** grams in a matter of seconds. It's an important part of the Edel Golf system. Usually we can nail distance control in just a few strokes.

“You should use a lighter putter (less than **TK grams) on slow greens and a heavier putter (more than **TK** grams) on fast greens.”**



SELF TEST
Rolling balls to a string tells you a lot about the consistency of your stroke and the putter components you need to change to get the right speed and direction every time.

SPEED MODIFIER #2: SHAFT FLEX

THE SHAFT ON your putter does more than connect the grip to the putterhead. Its length is a key component to nailing your aim (we'll save that for another time) and its flex is an important speed determinant. Flex is closely tied to the weight of your putterhead and the manner in which you accelerate as you make your stroke. Softer flexes make the head feel heavier and stiff flexes make the shaft feel lighter. Here's an example. I had a customer that returned his putter because he wanted me to add more weight to the putterhead. From his file I knew that the current head weight was absolutely perfect for him, so instead of altering that spec I simply put a softer shaft in. The customer rang after a few days to ask me how much weight I added to the putter because he was rolling the ball perfectly!

You can discover the best flex for you the

same way you discover the appropriate head weight. Go back to rolling balls to a string and experiment with different shaft flexes until you can consistently hit the distance on the money. Changing the flex is the same as changing the weight—softening the shaft makes the putterhead feel heavier and stiffening the shaft makes the head feel lighter. (The opposite also holds true: adding weight makes the shaft feel softer and removing weight from the head makes the shaft feel stiffer).

ACCELERATION EFFECTS

The weight/flex relationship isn't the only one that affects speed. The relative softness or stiffness you feel in the shaft has a lot to do with the way you accelerate the putter as you make your stroke. The faster you accelerate, the more than the shaft will flex. Less acceleration makes the shaft feel stiffer.

There are two ways you can accelerate:

1. Radial Acceleration: A motion originating from the center and working outward, like a slingshot. This is the acceleration found in arc strokes (see Chapter 4).

2. Linear Acceleration: A motion originating from a thrust that's parallel to the ground, like the back-and-forth motion of a piston. This is the acceleration used in most pendulum strokes and in Maggie Will's Brush Stroke (Chapter 5).

Most golfers prefer to accelerate one way or another, which may help explain why certain golfers prefer to swing their putter on an arc (radial accelerators) or straight back and through (linear accelerators). Problems

happen when you mix and match. In other words, you either look like Jack Nicklaus, a linear putter, or Tiger Woods, a radial putter, or you look frustrated because you try to look like both.

YOU KNOW YOU'RE A RADIAL ACCELERATOR IF:

- You tend to make long strokes and accelerate the putter gradually.
- You like to adjust for putt distance by varying the length of your stroke, not the force of it.
- Your backstroke is usually longer than your forward-stroke.
- You're good at speed putts and lags.

EQUIPMENT PRESCRIPTION:

Go for heavier head weights and softer shaft flexes.

YOU KNOW YOU'RE A LINEAR ACCELERATOR IF:

- You tend to keep your stroke length the same and add or remove thrust to control the distance you hit your putts.
- You prefer a short backstroke and an accelerating through-stroke
- You're okay on short putts but longer putts give you fits.

EQUIPMENT PRESCRIPTION:

Opt for stiffer shafts, and extra weight either in the middle of the shaft or at the grip (counterweight).

SPEED MODIFIER #3: COUNTERWEIGHT

HAVE YOU EVER changed your putter grip? A lot of golfers do to create a new look or feel in their flatstick, or to adjust to their hand size. While these types of changes are always made with good intentions, they seriously alter the overall performance of your putter. Standard grips can vary in weight as much as 30 to 40 grams even though they look and feel similar. Gripping your putter with a midsize or jumbo grip can add up to 110 extra grams. What golfers don't realize is that adding weight to the handle makes the head feel lighter, which you've already learned has drastic implications when it comes to speed control.

Manipulating weight at the grip end of the putter, also known as counterweighting, is a relatively new concept in putters. In the grip example above the counterweight was used as a negative. Under the watchful eye of a fitter, however, adding weight to the handle—and sometimes the middle of the shaft—is an effective way to improve the way the putter reacts in your hands. Our fitting system is replete with multiple ways to alter the weight of the grip end and the shaft to not only match the speed-control needs of individual players, but

also their aim. Here's how it works:

IF YOU TEND TO AIM MORE TO THE LEFT...

● **Experiment with counterweights either in the handle or the shaft.** My research shows that counterweights promote a sense of blocking, which helps left aimers compensate for their bias. Also, left aimers tend to be more linear in their acceleration patterns, and the extra handle weight gives them something to push against. (Once a left-aim bias is corrected, however, counterweights are no longer effective for these individuals.)

IF YOU TEND TO AIM MORE TO THE RIGHT...

● **Avoid counterweights and experiment with different head weights,** since the extra handle or shaft weight promotes a sense that you're blocking the putt—a double whammy. Once you correct your right aim, however, counterweights can be of great service. Most right aimers tend to retain the outside-in stroke they used to compensate for right aim even after they learn how to aim straight. Counterweighting relaxes this outside-in motion since its more difficult to release the putterhead with extra weight toward the handle.

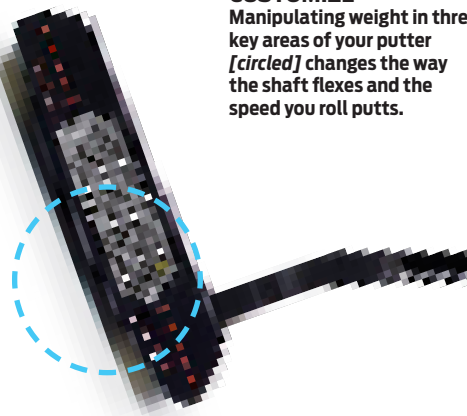
HOW MUCH COUNTERWEIGHTING, IF ANY IS RIGHT FOR YOU?

Again, the string test holds the key. Also, since counterweighting affects aim as well as speed, putt balls to a specific target to gauge how the weights affect your direction (left or right) as well as your distance. You can easily add weight to the handle or shaft with simple lead tape (available in any pro shop).

“Adding weight to the handle makes the head feel lighter, which has drastic implications when it comes to speed control.”



PUTTERHEAD
Adding weight closer to the head makes any shaft feel softer.



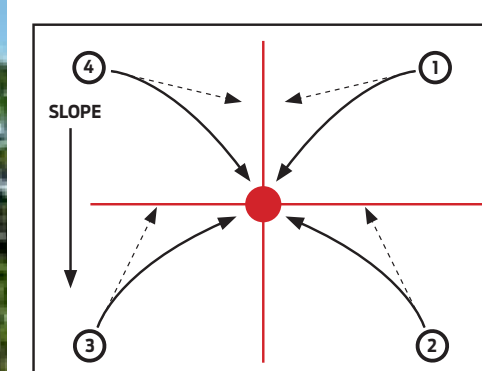
CUSTOMIZE
Manipulating weight in three key areas of your putter [circled] changes the way the shaft flexes and the speed you roll putts.



SHAFT
Weighted shaft inserts can enhance the feel of a straight-back-and-through stroke.



GRIP
Counterweighting is a powerful tool to improve the shape and feel of your stroke.



QUAD PUTTING
 This chart shows you the difference between the true aim and the expected path for each putt in all four sections of the quad. If your bias—or putter—forces you to aim left or right of the true aim point, you'll have to adjust by manipulating speed and the path of your stroke. This is difficult to pull off with consistent results, mandating the need to get aim right in the first place with a putter that allows you to.

COMPLETING THE TRIAD: PATH

WE'VE TALKED a lot about aim and speed, but what about the third member of the Triad, path? There's not much you can do to your putter to affect path compared to aim and speed, but it's important to know that the path of your stroke is entirely dependent on where you aim and at what speed you hit the putt, two components of the Triad that can definitely be affected by changing your putter. So, in a sense, the physical makeup of your putter has a lot to say about how you swing it back and through.

DEALING IN QUADRANTS

The best way to see how your putter makeup and the Triad work together is to recognize that every putt you'll ever face starts in one of four quadrants surrounding the hole. Basically, there are four sides to every cup situated around what's called a fall line, which is the line on which the ball rolls without any curve (you'll learn all about this with green reading pioneer Mark Sweeney in Chapter 6). Check the photo at left to see how the quadrant works and pay attention to how mistakes in your aim affect your path and speed.

- Quadrant 1:** Downhill right-to-left putt.
- Quadrant 2:** Uphill right-to-left putt.
- Quadrant 3:** Uphill left-to-right putt.
- Quadrant 4:** Downhill left-to-right putt.

When Your Putt is in Quadrant 1, the true aim point is right of the hole. If you have a right-aim bias, you'll miss the putt wide right unless you alter your path by pulling the ball or hit the ball with less speed. If you have a left-aim bias, you'll miss the putt on the left unless you alter your path by pushing the ball or add speed to remove some of the break.

When Your Putt is in Quadrant 2, the true aim point, again, is right of the hole. If you have a right-aim bias, you'll miss the putt wide right unless you alter your path by pulling the ball or hit the ball with less speed. If you have a

left-aim bias, you'll miss the putt on the left unless you alter your path by pushing the ball or add speed to remove some of the break. There's the additional problem in that this putt, as is the putt in Quadrant 3, is uphill and every golfer has a built-in tendency to hit this putt harder to track the right line.

When Your Putt is in Quadrant 3, the true aim point is left of the hole. If you're a left aimer you're already pointing your putterface above the true aim point, so there's no help in hitting the ball harder like you subconsciously do on uphill putts—you'll just miss to the left quicker. A speed adjustment may help a right aimer since it will offset the fact that they're setup to play less break.

When Your Putt is in Quadrant 4 the left aimer is already aimed above the true aim point (left of the hole), but since this putt is downhill, changing the path by pushing the ball is a scary proposition because of the speed. Similar trouble awaits a right aimer—any additional speed here or a change in path will make for a scary second putt if the first one misses.

In conclusion path always changes to meet the requirements of speed and aim, and as the four quadrants show, altering path—as well as speed—to compensate for aim makes things very difficult. Use your equipment to fine tune your aim and speed and your path will almost always correct itself on its own, holing putts from each of the quadrants a matter of simply making a good read and then smoothly pulling the trigger.

“Path always changes to meet the requirements of speed and aim, and altering path to compensate for aim makes things very difficult.”

BUILDING THE PERFECT PUTTER

I HOPE THAT the information in this chapter has helped you realize the value of playing with the correct putter. Within this realization lies the platform to develop a competent putting game and take your scoring to new lows. The complexities built into this aspect of the game are many, so taking a nonsensical approach can be dangerous. That's the real value I see in my fitting system: there's a concrete, justifiable reason behind every hosel change and additional gram added to the putterhead. Each alteration is made with the same goal in mind: improving all of the factors in your Putting Triad. As I mentioned previously, I can build 16 million unique putters with the components stocked in my fitting cart [photo, right]. With the right knowledge, you can weed out the ones that won't work for you based on your tendencies and find one that helps you putt the lights out.

My views on putter fitting and enhancing the Triad are not mine alone. Many have contributed to both my and the system's development. I would like to thank my friend Mike Schy a great teacher and professional for listening to my theories and providing positive feedback; David Orr, Director of Instruction at Campbell University PGM Program

for contributing to my knowledge and testing ideas to validate the value of putter fitting; Bobby Dean, for selling enough putters to keep us alive; Mark Sweeney for giving us his knowledge about green reading (chapter 6) and creating the final major piece to the

putting puzzle; Geoff Mangum for tenaciously studying the putting game and sharing his information; and teaching legend Chuck Cook, my first account, who gave me the credibility to reach out and expand this exciting new world of putter fitting to outlets nationwide.

THE PERFECT PUTTER IN 20 SECONDS



LOFT
I have specially designed face plates with 0 to 5 degrees of loft that attach and un-attach easily to the head.



TURN STYLE
I can change 10 different head and shaft components with a special tool of my own design in an instant.



HOSEL
A choice of 11 hosel styles makes it easy to fit a student for his aim bias after I assess his aiming tendencies with the laser.



AIM LINES
Another of my inventions is a stencil that allows me to experiment with multiple aim lines and arrangements when dialing in a student's aim.



READY TO GO
Once all the pieces are in place, the specs for the fitting are noted and built into hand-milled putters machined at my shop in Dallas, Tex.

FIT FOR SCORING
My fitting system allows me to match golfers with a putter that improves aim, speed and path in a matter of minutes.

