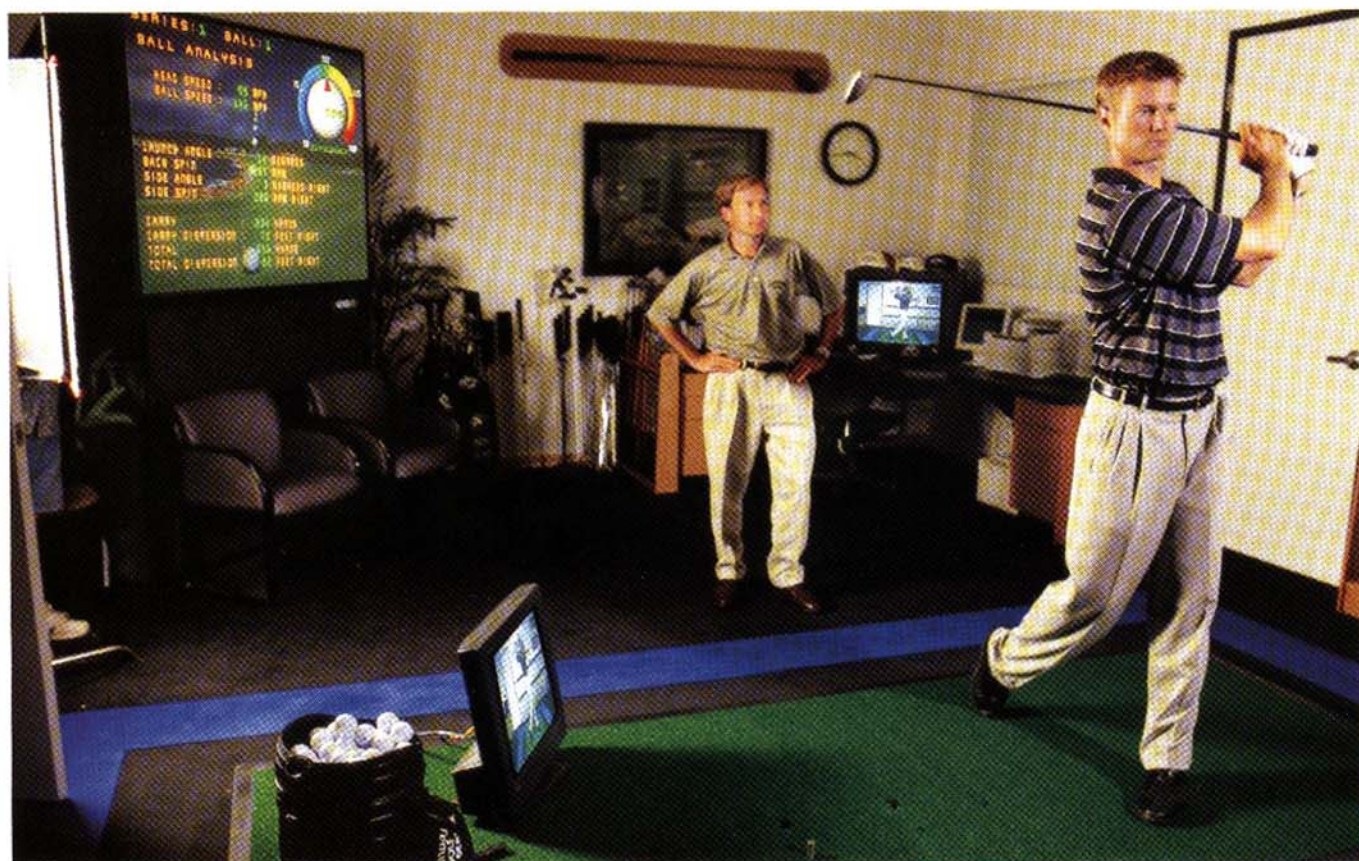


Fit for a Swing

New computerized technology makes custom-fit clubs the only way to go.

BY A.G. POLLARD JR.



COURTESY OF CALLAWAY GOLF

A MAN WALKS INTO AN EXCLUSIVE Savile Row haberdasher, fingers a nice dark gray worsted wool suit, and tells the clerk, "I'll take this one. Wrap it up."

"But sir," the clerk protests. "Wouldn't you like to try it on first? The trousers are unhemmed, and so are the sleeves of the coat. You may require an adjustment at the waist, or at the vents, and we don't even know which way you, er, *drape!*"

"Not to worry," the customer says. "I'll make it all work somehow."

As unlikely as this scenario is, it happens every day. Not on Savile Row, but in pro shops and golf stores everywhere. Instead of a fine worsted suit, buyers are picking sets of golf clubs off the rack, untested and unfit. For those serious about scoring better, it's sheer insanity.

It's easier than ever to get kitted out with a customized set of clubs. Virtually every major manufacturer offers some kind of program designed to match one's swing idiosyncrasies with made-to-order clubs. New technologies make it easier to gather the data

club makers need to arm golfers with weapons that make it easier to hit the ball in the desired direction.

Karsten Manufacturing began the custom-fitting craze about 30 years ago with its color-coded Ping Eye clubs. Although the system relied on "static" measurements—height, arm length, and hand size—golfers felt that they received something of value because a golf pro wielded the tape measure.

Today, the buzzword in custom-fitting is "dynamic" measurements. In addition to the static data, club fitters also take into account what happens while a club is in motion, measuring an individual's swing path, swing speed, and angle of attack. Along with the resulting ball flight, whether real or virtual, those elements, which can be captured by new laser-guided computer sensors and high-speed digital cameras, provide club makers with reams of data that enable them to tweak a 5-iron to the perfect fit.

These dynamic measurements are obviously vital to getting the right kinds of clubs for each individual's game. Consider swing speed. Few of us have the same

effortless power of Tiger and his pals, who can move the club at speeds of 110 miles per hour and more while keeping their swings under control. Those guys have a combination of skill, physical prowess, and perhaps something delivered from the gods. Most of us swing the club at a top speed of about 90 mph.

Swing speed helps determine the proper shaft flex for one's club. The slower the swing, the more flex or "bend" in the shaft is needed to properly load the club on the backswing and have it unbend or kick at the moment of impact. Too stiff, and the golfer loses control.

Another key determinant is clubface angle at impact. Here is where our individual quirks are truly revealed: Some of us close down a club's loft at impact, while others leave it open a hair. Only the new computerized sensors can truly determine what's happening at impact. A good club maker can tweak a set of irons to compensate for this minute imperfection and make the ball start off in the right direction.

Then there's good old-fashioned lie angle. The static Ping fitting system "prefigured" the lie angle, the angle between the shaft and the bottom edge of the clubface. But the angle of attack into the ball is unique for each golfer. Measured dynamically, computers can pick up a swing that's upright or flat, and a simple bend of the hosel increases the odds that the club's sweet spot meets the ball swing after swing.

Golfers can find computerized test centers almost everywhere these days. During "demo days" at clubs and public facilities, manufacturers like Titleist, TaylorMade, and Cleveland wheel out carts of test clubs and set up hitting stations equipped with the new computerized sensors. The testing is usually free in the hope that a few "eureka" swings will lead to the sale of a new set of irons.

Callaway Golf recently announced a new dynamic fitting system that utilizes a laser-measurement device connected to an IBM ThinkPad laptop. The system collects the necessary data from a golfer's swing and calculates the proper club specifications, which the attending golf professional submits to the factory. The system also works with A-STAR video for use as a teaching tool.

A similar laser-guided measuring system is the GolfAchiever, invented by Stanford University engineer Yi-Ching Pao, who wanted some qualitative information to help his own game. Using a mere 10 swings (indoors or out), the GolfAchiever captures a heap of data about the swing: speed, face angle at impact, launch angle, side- and back-spin rates, and more. Both custom club fitters and golf professionals use GolfAchiever.

Dave DeJohn developed a custom fitting system for putters, originally for Bettinardi, which he recently took out on its own to sell to pros and custom-fit shops. His putter fitting system uses high-speed digital cameras to capture the moment of impact on the putting stroke so that problems with loft as well as open and shut faces can be addressed in the manufacturing process. The machine can't guarantee a yip-free stroke, but it can ensure that players use the right equipment.

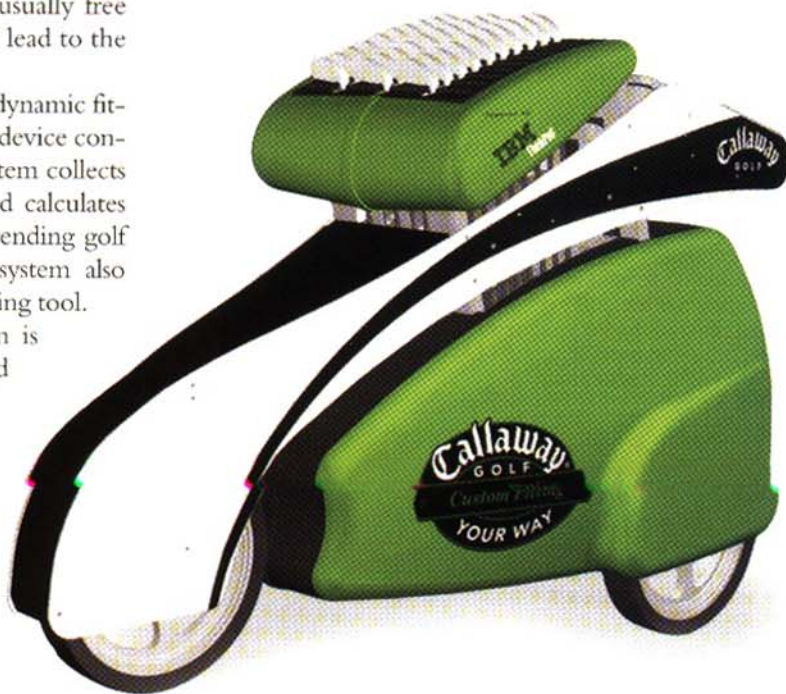
Even an old brand name in golf, MacGregor, is jumping on the custom-fit bandwagon. MacGregor's program, however, goes much further than any other in the industry. For a price of around \$8,000 per set, the golfer is flown to MacGregor's factory in Albany, Ga., measured both statically and dynamically, and then invited to watch while a new set is forged out of blocks of steel. Then the player goes to the range, tries a few early prototypes to make sure the specs are right, and journeys home to await the finished product.

That might sound like overkill to all but serious golfers, but professionals routinely go through such a process to obtain their moneymaking sticks. Today's technology, however, is now available even to those of us who only play for the occasional \$2 Nassau, and we'd be silly not to take advantage of it.

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Callaway's new state-of-the-art fitting system marries laser technology to an IBM ThinkPad.



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