



GFW Technology

FUTURE GOLF

Forget *Harvey Penick's Little Red Book*: The age of digital-assisted golf instruction has arrived.

By MIKE STACHURA

WHEN YOU'VE BEEN SHOOTING 140 for longer than you can remember, one of two things needs to happen. You either have to dramatically change what you're doing, or you have to quit the game. This is the Road to Damascus moment Diane Harper came to a few years ago.

"I had been taking lessons at a local course for six months and I wasn't seeing any improvement," says Harper, 44, a mother of four grown children who lives in Denver. "I really needed help."

So Harper decided to give golf one more shot. Only this time, instead of traditional instruction, she opted to go to a new kind of school: a local GolfTEC franchise in Denver. GolfTEC is the leader in a growing wave of software-based teaching methods and facilities that use digital video and motion-capture-analysis technology to help golfers improve their games. At a GolfTEC "store" (which can be a boutique within a larger retail store or a stand-alone facility), players put on a lightweight belt and shoulder harness equipped with sensors that detect a variety of body movements: hip turn, arm angle, shoulder turn, head position, swing plane and forward tilt at address. A teacher then assesses how a particular movement compares to any of 150 tour players in the GolfTEC database. Then, as a bit of Pavlovian self-improvement, the teacher programs a system of alerts (usually

beeps) that sound when a player strays outside the optimal range of motion.

Harper began working with GolfTEC director of instruction Ty Walker, whose step-by-step method started with attacking the misaligned angles in Harper's setup. "Her posture was very bad," Walker says. He showed Harper that she needed to increase her forward bend at the shoulders and at the hips. GolfTEC's system also revealed that Harper's hips were rotating open only 10 degrees at impact. Through the use of its digital camera system, Walker explained to Harper how she could improve the angles in her address posture. By bending forward 10 degrees farther from the shoulders and four from the hips, Harper was able to rotate her hips more efficiently. Now she registers at more than 30 degrees and is trending toward the elite-player paradigm of more than 40 degrees. She also corrected the bend of her left arm at impact, and as a result stopped topping the ball. "Instead of working on a lot of different things," says Walker, "we could show her the numbers."

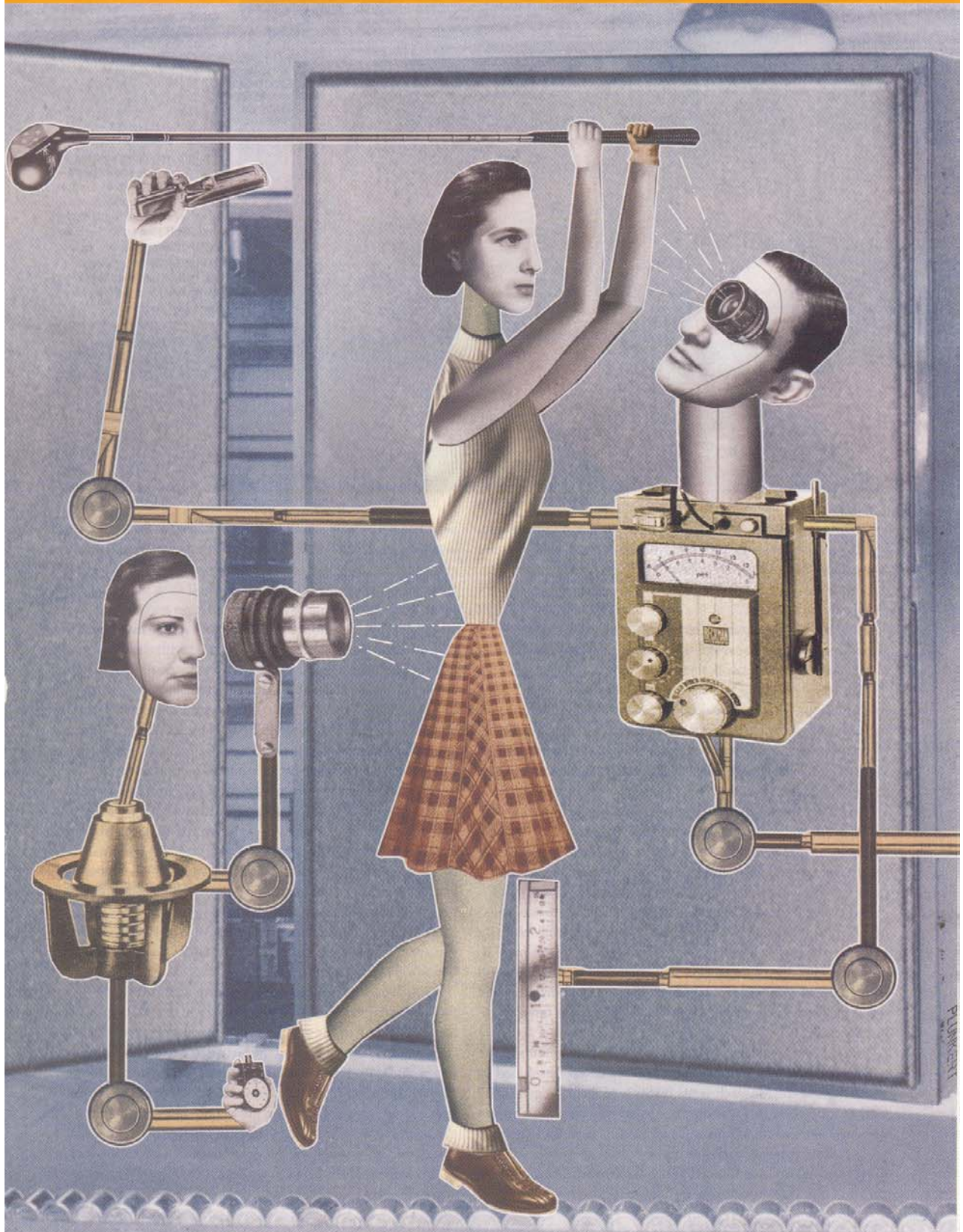
And the numbers clicked with Harper. "Right away, I thought, 'Gee whiz, this will probably help me out,'" she recalls. "They broke down every single aspect of my swing. Before, there were a lot of distractions. Now I can really concentrate on specifics."

GOLF FOR WOMEN

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INDOOR LEARNING



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Inside Moves

Left: Top Swing's computer-controlled robot allows beginners to feel the correct motion from the very first swing. (It's not yet available in the U.S.) Below: Golf simulators such as the P3ProSwing identify impact flaws on-screen after every shot; golfers can then apply what they've learned outside, on the golf course.



That "gee whizz" moment occurred two-and-a-half years ago, and Harper has been taking a half-hour lesson at GolfTEC every week since. "Now I can play golf with strangers, and I enjoy it. I'm not out there making a fool of myself and not knowing why. It's made a huge difference."

How huge? Last summer, Harper shot a career-low 94. That's about a 50-stroke improvement, the sort of extreme makeover usually reserved for network television.

This brave new world of biomechanical feedback is changing the landscape for golf learning. The game's long lament about players never getting better may be about to end, thanks to those twin towers of innovation, the digital camera and the computer. It is as if golf instruction has fast-forwarded from the crank phone to the cellular phone in the blink of an eye.

Any player who's seen her swing on video and thinks she's experienced high-tech golf teaching needs to take a seat. The new landscape of golf instruction includes motion sensor vests, virtual reality goggles and grips embedded with microchips. One of the more ingenious setups belongs to Accelerized Golf, an Atlanta-based company. Its program features a multi-camera-based indoor hitting system, where players hit electronically teed-up balls off a mat into a net and a teacher sets up "Hot Lines" to guide a player developing a new skill. Stray into the hot lines and a mechanism removes the ball from the tee. In short, the only way a player can actually hit the ball is to execute the new fundamental correctly.

You don't even have to leave home to reap the benefits of the new technology. Iclub is a swing-monitoring device developed by researchers at the Massachusetts Institute of Technology's (MIT) Center for Sports Innovation. It consists of a grip attachment designed to measure tempo and swing path, as well as the Body Motion System, a backpack-like harness that can measure everything from hip rotational speed to hip-turn-versus-shoulder-turn

ratio. The P3ProSwing analyzer offers a home version of its professional system that combines swing and impact information with a golf simulator. It works with your personal computer to provide feedback on 11 different elements of a golf shot, including swing speed, ball speed, swing path, impact location and face angle.

But fear not, technophobes: High-tech golf instruction is distinctly user-friendly. In fact, some familiar with simulator-based learning believe it has the potential to drastically reduce golf's tendency toward early intimidation and frustration.

"The indoor experience of the game tends to be more inviting," says Bill Bales, CEO of AboutGolf, one of the leading golf simulator and launch monitor software companies in the U.S. AboutGolf's simulators, where golfers hit balls into projection screens of digital versions of famous courses, are increasingly being used for instruction. At the PGA Tour Superstore in Roswell, Ga., some 9,000 indoor lessons have been given on the store's 10 AboutGolf simulators over the last 18 months.

"It takes away a lot of the intimidation, and it lets beginners learn at their own pace," explains Bales. "And the players react to the immediate data, even though they don't realize it. We are a culture of instant gratification, and I believe this applies to golf, too. If you are able to see measured results instantly, that can be motivational. You react to it and improve."

Golf simulators like those developed by AboutGolf and Full Swing Golf, whose systems have been used by top instructor Jim McLean in his teaching centers, provide feedback about shot distance and direction, allowing a player to self-monitor her progress on the spot. Not only that, they're fun. Indoor golf centers are popping up across the U.S., offering a new, vibrant space in which the game can grow. One intriguing example is the Evergreens Indoor Golf Center in Queensbury, N.Y. With its five AboutGolf simulators, the shop is a mecca for golfers looking to practice or play during the winter months. But it's Evergreens'

THIS PAGE FROM LEFT: COURTESY OF TOPSWING; COURTESY OF P3PROSWING; OPPOSITE PAGE: COURTESY OF K-VEST



INDOOR LEARNING

weekday-morning Swings Golf Performance program that could well spark a mini revolution. It's set up like a Curves workout program. Each of the five simulator stations features a specific swing skill for players to work on. Ten players with three instructors use the simulators for five to 10 minutes a time, with golf-specific stretching exercises in between each station.

"The great thing is that there's no pressure," says owner Ken Reynolds. "Our women are always the ones saying, 'Wow, it's over already?' when the hour is up." He has added a personal trainer to the program and plans to upgrade the simulators with a new electronic sensor system that reveals weight shift information.

According to Mike Clinton, senior vice president at GolfTEC and a PGA pro, his system and other interactive swing analysis systems offer a paradigm shift in both understanding how improvement happens and then producing it. "We've known that there are different types of learning—auditory, visual, kinesthetic," he says. "That's what is happening all at once with our system. It's given us a platform to say, 'Here's what's going on with the golf swing.' Now, in one swing I can get you to feel the right motion."

New research appears to support Clinton's claims. At a recent golf technology conference at MIT, GolfTEC's Joe Assell presented the results of a study showing that a group of Colorado section PGA pros were only able to correctly diagnose swing flaws 30 percent of the time without motion capture analysis at their disposal. In Assell's early days as an assistant pro at Denver's Cherry Hills Country Club, where he used an early swing analyzer computer, he observed that members improved when they regularly spent time checking the data being churned out by the machine: face angle, swing speed, etc. "We were not computer experts by any means," says Clinton, who formed GolfTEC a decade ago with Assell. "But we really started to see people improving faster here. They could see it and they could feel it."

"I go onto the golf course," says Harper, "and if I'm missing shots, I know what's going wrong now."

"I think because of television and the daily dependence on computers and the Internet, people are far more visual learners than they used to be," says PGA Master Professional Bill Baraban, who directs the indoor lesson program at the Roswell, Ga., PGA Superstore, which combines simulators with video instruction. "Look at it this way: Flight simulators have been part of learning to fly for years. It's a pretty important part of that learning curve. There's no question this technology gets them to the first tee with much more information and much more confidence."

That is clearly the mission of the current crop of tech-based golf instruction evangelists. Michael Bentley is the mind behind K-Vest, a swing analysis sensor that digitally translates the biomechanics of a player's golf swing in three dimensions. Using motion capture analysis, Bentley has researched golf swing improvement—or the lack thereof—for the last 15 years. What have he and others discovered? Not only is the golf swing itself an unnatural series of movements, but *understanding* those movements is neither natural nor easy. "If you really look at the

golf swing, a good 80 percent of it happens outside the player's field of vision," says Bentley. "Without having a framework for immediate feedback, learning something this complicated becomes almost impossible.

"You talk to any of the motor-skill-learning experts, and they will tell you that you have to find a way to break down the skill to its most basic level. You see that in martial arts, where a student first learns the body movements long before getting to hold a weapon. Then, he learns to combine the body movements with the weapon before beginning to practice on a target. Only then is the target brought into the skill. In golf, we're combining body movement, weapon and target all at once, right from the start."

GolfTEC has a wall of fame at each of its stores, where its students' achievements are celebrated with a commemorative golf ball tacked to a bulletin board. But Diane Harper doesn't want a ball with her name on it yet: She's waiting until she breaks 90.

"The improvement I'm making is what keeps me coming back," she says. "I know I wouldn't have stuck with it had I been taking the same old lessons. This program is making it easier for me to want to work on my game. I go onto the golf course, and if I'm missing shots, I know what's going wrong now. It makes me want to get better as fast as possible." ●

WHERE TO GET DIGITAL

ABOUTGOLF: It has simulators in Golf Galaxy stores nationwide and PGA Tour Superstores in Roswell, Ga., and Myrtle Beach. A 40-minute lesson starts at \$25; aboutgolf.com.

ACCELERIZED GOLF: Facilities with Hot Lines devices are located in six cities, including Los Angeles, Atlanta and Wilmington, N.C. A five-week lesson plan with unlimited practice is \$600; accelerizedgolf.com.

FULL SWING GOLF: The hitting bay dispenses shot-by-shot readings on distance, dispersion and launch angle. For locations and prices, go to fullswinggolf.com.

GOLFTEC: There are 63 stores in 15 states. Evaluations start at \$165; weekly packages run \$75 per lesson; golftec.com.

ICLUB: The grip-based system costs \$3,600; iclub.net.

K-VEST: To find a teaching pro who uses this harness-based system, go to k-vest.com. Lessons start at \$75 per hour.

TAYLORMADE MATT SYSTEM: Motion Analysis Technology takes swing and body motion measurements and creates an animated 3D image of the player. Prices start at \$300; for locations, go to taylor-madegolf.com/matt.asp.

P3PROSWING: The swing analyzer software runs \$700; p3proswing.com.

VIRTUALLY PERFECT GOLF: The learning system employs virtual reality glasses to help a player see and feel her swing. Lessons start at \$100; virtuallyperfectgolf.com.



In a K-Vest class, golfers get instant swing feedback via sensors that transmit data to a computer.