

TWGT, GOLF DIGEST JOINT RESEARCH

After months of preparation and analysis, test results from the joint driver research conducted by *Golf Digest* and Tom Wishon Golf Technology were recently published in *Golf Digest*. The article, written by TWGT owner and chief clubhead designer Tom Wishon, reviews the effects of changing driver loft and its effects on shot distance for a wide range of golfer swing speeds.

According to *Golf Digest*, the magazine's editors trusted TWGT to provide precisely crafted clubheads of different driver and 3-wood lofts assembled onto shafts, so that the test results would be as consistent as possible. In addition, TWGT driver heads were selected because of the close tolerance to the coefficient of restitution (COR) that TWGT designs maintain.

Research information was derived from tests conducted by Golf Laboratories, an independent facility in San Diego, Calif., and all tests exclusively used clubhead designs from Tom Wishon Golf Technology. The test compared the launch angle, carry distance, total distance, ball velocity and spin rate of the Wishon 915CFE drivers (360cc) hand-selected to lofts of 9-, 10-, 11-, 12- and 14 degrees, all assembled with the Wishon ZT Series graphite shafts that were selected for total bend profile consistency. In addition, a Wishon 720w 3-wood (16°) and built to 3-wood length with the same shafts was included for comparison to the driver results. Each club was robot tested at 10mph increments of swing speeds from 65mph to 115mph and all data was reported to *Golf Digest* for further analysis and publication.



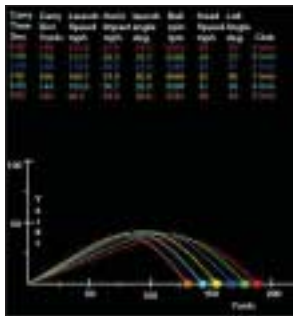
DRIVER LOFT RESEARCH was a main focus of the November 2003 issue of *Golf Digest*. The article, written by Tom Wishon, discusses the results of research from the combined efforts of Tom Wishon Golf Technology, Golf Laboratories and *Golf Digest*.

A longest-standing member of the *Golf Digest* Technical Advisory Panel, Wishon remains the only technical expert from the component clubmaking industry asked to sit on this prestigious panel. Other members include the heads of engineering or product development from Callaway, Ping, Mizuno, Nike, TaylorMade, Royal Precision, Nicklaus Golf and Golf Laboratories.

IMPORTANCE OF LAUNCH ANGLE

Launch angle is the most critical clubfitting factor for determining shot distance. While ball velocity is, indeed, a major factor in how far a ball travels, ball velocity is primarily a factor of the golfer's athletic ability and can only be increased slightly when matched up with the right clubhead. This is especially true since the U.S. Golf Association placed limitations on the clubhead's spring-face effect (aka coefficient of restitution). However, if a clubmaker can see and evaluate the launch angle of the golfer, TWGT

research indicates that an increase in launch angle will provide most golfers with more distance, particu-



LAUNCH ANGLE, one of the most important ball flight parameters in custom fitting, can provide most golfers more distance. The TWGT Trajectory and Launch Parameter Software, illustrated at left, provides high-tech analysis of launch angles which is critically important in helping clubmakers to understand this important factor. See also, page 74.

larly those golfers with driver swing speeds less than 90mph.

Aerodynamic ball flight occurs when the golf ball is launched with such speed and backspin that the ball generates its own lift. This combination of high ball speed and lift 'holds' the ball in the air longer, thus accounting for more hang time and greater carry distance. Ballistic ball flight is flight with little or no lift and is more like the action of throwing a ball, where little more than the launch angle and the lower launch velocity keep the ball in the air. Hence, with ballistic flight, hang time and carry distance are less.

Golfers who swing the driver less than 90mph create more ballistic flight. While a well-engineered and fit 'thin/spring-face' driver can add some ball velocity, the increase will be in single-digit increments of miles per hour. That is where launch angle helps. By increasing launch angle by increasing clubhead loft and then choosing a shaft that enhances the launch angle, the right combination of head and shaft can provide significant distance gain for golfers with average-to-slower swing speeds.