

VIDEO GOLF

Looking for an accurate way of measuring golf shots, engineer

George Nauck conducted research in libraries and found that there were available a great many systems — cameras, sensors, computers — for analyzing the golf swing. But, he also found, the typical golf practice range provides virtually nothing in the way of measuring the result of a golf swing, the quality of a golfer's performance.

"As an engineer," he says, "I know something about the need for measurement and feedback to improve any process, and I felt that golf was no exception. There was clearly a need for down-range measurement on a practice range and for immediate accurate feedback to the golfer."

So Nauck filled the need by developing such a system himself, with a technological assist from NASA. Marketed by Nauck's company — known as ENCORE!!!, Jacksonville, Florida — it is called the ARPM (Advanced Range Performance Measurement) Video Golf System. An elevated camera located behind the tee follows the flight of the ball down range, catching the point of impact and subsequent roll. Instant replay of the video on a PC



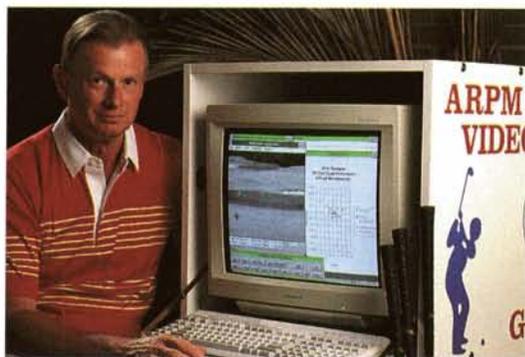
monitor at the tee (**above**) allows measurement of the carry and roll. Distance and deviation from the target line are measured, as well as distance from a target when one is selected.

Groups of shots at a target are statistically scored to provide quality of performance information that serves either as an immediate basis for making adjustments or as a permanent record of skill level progress for golfers of all levels seeking to become a low handicapper. Such information is also important to the competitive professional golfer; tour pros have used the system to get immediate, precise information about carry and roll distances for every club in their bag.

In developing the system, Nauck found that library research was not enough for a determination of exactly what technologies were needed for a golf range measurement system. He contacted the Alabama Technology Assistance Partnership (ATAP), whose mission is to assist small businesses in identifying and accessing advanced technology. ATAP assisted him in preparing a problem state-

ment for submission to the Technology Transfer Office at Marshall Space Flight Center (MSFC). The request for assistance outlined Nauck's general concept and specifications for a golf range measurement system and asked what technologies might be applicable to such a system.

MSFC studied the concept, suggested video and image processing/computing technology, and also provided leads on commercial compa-



nies dealing in the pertinent technologies. Nauck (**shown above**) contracted with Applied Research Inc., Huntsville, Alabama for development of a prototype system, which was successfully field tested, debugged and refined in the summer of 1994. In October of that year, the ARPM system was introduced to the commercial market.