

THE DAWN OF THE WATER MANAGER



The spectacular ninth hole approaches the clubhouse and a large waterfall.



Richards Jenkins, irrigation supervisor at Gainey Ranch, checks the valve output pressure to the heads.

By Kenneth B. Christley

As the first light of dawn breaks across nearly every golf course the distant purr of a turf vehicle can be heard among the calls of morning birds and the chatter of sprinkler heads. It is the superintendent checking his course before the first four-some tees off.

The sharp eye of the superintendent will catch imperfections such as poor tee or pin placements, untrimmed cart path edges, uneven mowing patterns, fertilizer deficiencies and any condition inconsistent with nature at its best.

One of the most frequently observed conditions of all is the lack or overabundance of irrigation on the course. As the system concludes its early morning cycle, its flaws are most obvious. The superintendent can observe problems with water application, leaking joints, malfunctioning valves and stuck heads. He makes notes for the water manager to take corrective action primarily to keep the system operating as it was designed.

Today, the superintendent has an additional purpose in mind when he checks his irrigation system. Stringent new laws on water conservation are now in effect in many states to control dwindling water supplies in the face of rapid growth. If rising water and pumping costs aren't enough, governmental agencies will soon require proof that water conservation practices are being implemented. Every superintendent must face the fact that he now has to put forth a determined effort to conserve one of our most valuable resources.

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Lakes allow Gainey Ranch Golf Course to take full advantage of rain and to store reclaimed water for irrigation.

Water Manager

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Both superintendents and general managers are realizing they have to focus more of their attention on conservation techniques and employ experienced "water managers" to implement them. Most superintendents or general managers simply do not have enough time to devote to the maintenance or operation of today's computerized control systems. Experienced people who have installed irrigation systems or worked for irrigation supply houses tend to make good water managers. But, even with their years of experience in system design, maintenance and operation, they may not fully understand what's involved with new computerized systems.

When a facility warrants the use of a computerized irrigation system, it also needs a full-time water manager on staff. Golf courses, such as The Phoenician Golf &

Tennis Resort in Scottsdale, the Gainey Ranch Golf Club in Phoenix, the Phoenix Country Club, and many other facilities that use computers to manage their irrigation systems, are currently utilizing training programs for water management personnel. These programs help owners of large irrigation systems to get the full benefit of modern irrigation hardware and software, to provide optimum turf and landscape conditions, and to prove to legislators and the public that the turf industry has a genuine interest in conserving water.

Irrigation management on golf courses in the Desert West started to change in the early '80s when the first computerized central controls were installed. The potential savings of the computerized irrigation were unfortunately hampered by the relative complexity of its operation. The superintendent didn't have the time to devote hours to programming and the irrigation specialist



Water and sand hazards make the fourth hole a tough par 3.

on the course often found the computer difficult to understand. I was one of those irrigation specialists, so I know.

When The Phoenician Golf & Tennis Resort installed the first Rain Bird Maxi II in 1980, I was suddenly being asked to change from a skilled irrigation installer and repairman into a computer operator. All programming was done by numerical codes, not with common English used by personal computers today (such as on the Maxi III). Rain Bird representatives worked closely with us to get the system up and running. It took weeks before I really understood how the computer worked.

But it was that experience with an irrigation computer that raised me up a notch from repairman to water manager. Suddenly I was more valuable to the course because I was able to make that computer do wonders.

From the very beginning, we started utilizing the computer to save water. Because we could control any station on any of the field controllers from the central computer, commands that were difficult to set up on previous controllers became easy. Short repeat cycles were programmed to replace longer continuous cycles to match application with percolation into the soil. If the weather turned cool and calm, the entire system (or portions of it) could be instructed to have shorter cycles since evaporation was less than normal.

It wasn't long before we started monitoring the pump system with computer. Sensors were installed to monitor the on/off operation of each pump. By recheduling the irrigation cycles, we prevented the pumps from running during peak electrical use periods when rates are highest. In one year alone, we saved \$8,000 in pump power usage.

My previous experience with irrigation system maintenance became very helpful in adapting the computer to save water. By combining this experience with many hours behind the computer keyboard, I was able to develop a list of computer-assisted water management practices. This has largely been the basis for the consulting work I do today. After the irrigation manager or the superintendent and I have spent 20 to 60 hours looking at his system, he links his knowledge of golf course water needs to the powers of the computer. The combination of his knowledge and the capabilities of the computer enable him to get the maximum use out of all system components.

Irrigation equipment manufacturers, along with irrigation consultants designing today's systems, are striving to provide water managers with the "tools" to achieve precise water application. They are incorporating pressure-regulating valves, low flow loss sprinkler heads, check valves, matched precipitation nozzles and high-quality drip irrigation equipment with the latest in central control equipment. Never before has more emphasis been placed on designing and manufacturing central control equipment that can allow the water manager to have virtually unlimited flexibility in irriga-



Christley (right) explains some of the capabilities of the central computer controller.

tion. Personal computers for central control now have a firm hold in the golf and commercial irrigation industry.

The computer is only limited in capability by your imagination. In the past, central

control equipment was built for one specific purpose. Termed "hardware" today, upgrading this equipment or adding new features was very costly, not only to the owner, but to the manufacturer as well. As old dedi-

cated systems became outdated or obsolete, you were stuck with a dinosaur.

The personal computers used in irrigation today operate with a combination of hardware and software. The software is constantly being updated, making it possible to upgrade your system or increase its capabilities without the need to replace your hardware. Within seconds a system can be upgraded simply by inserting a new program disc into the computer. Even amateur programmers can customize their systems to best meet their needs.

Now that these high-tech systems are available at our fingertips, we must use our imagination to take full advantage of their features. With a little training, you can open the door to all kinds of new system capabilities without leaving your desk. Some of these include; flow monitoring, field satellite monitoring, individual station control, total or partial system water budgeting, repeating cycles, pauses, link start capability, and sensing (and reacting to) changes in wind or rain. The list grows monthly.

Computers make various in-field sensors more practical by utilizing two-way communication. They can alert the water manager to specific problems in the field, such as a pressure loss caused by a ruptured pipe or a malfunctioning sensor. Important water-saving devices, which once required a trip to the field to check, can now be monitored

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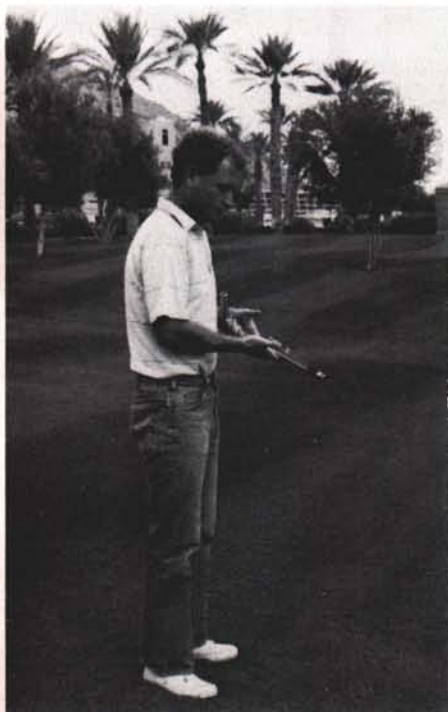
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Steve Collins, irrigation manager for The Phoenician Golf & Tennis Resort, checks the moisture content and root depth in a core sample.

at the computer terminal.

Most critical to the success of making these "tools" work for you is making a few adjustments in your thinking. First of all, remove the fear that a computer is too complicated to learn. Secondly, get over the myth that a computer is supposed to do everything by itself. Although computer commands are very basic today, you still have to give it certain precise instructions before it will respond.

Learning these commands takes time and practice. One of the best things you can do before installing a computerized control system is take advantage of training for yourself or your personnel. The computer has the ability to do much more than most operators know how to tell it to do. Training gives

the water manager a big advantage on the system against those who chose not to be trained.

By getting the absolute maximum benefit from your computer control system and incorporating a full time water manager, in turn, you will be well on your way to enhancing your own professional career. 

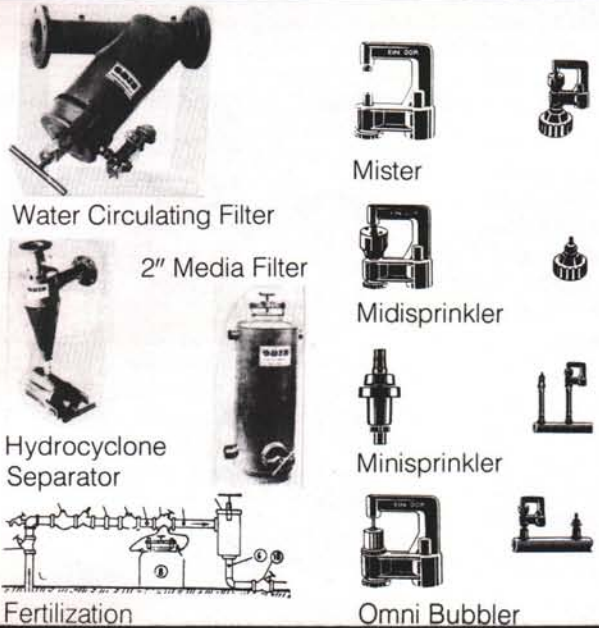
EDITOR'S NOTE: Kenneth B. Christley is a water management consultant based in Phoenix, AZ. He is a member of the Turf Growers Advisory Committee of the Department of Water Resources, State of Arizona, and the American Society of Irrigation Consultants.

A FEW GOOD WATER MANAGEMENT PRACTICES

1. Separate monitoring and recording of water use for turf, landscape and lakes.
2. Obtain evapotranspiration (ET) data for your area and follow these guidelines for irrigation purposes.
3. Always maintain the pumping system and the irrigation system in top condition (set up and follow a schedule).
4. Place a high priority on monitoring pumping costs and operation.
5. Keep a constant watch on individual irrigation zones, cutting back on the application until minor stress is noted. Then, adjust the cycles to just above that level.
6. Use soil probes to physically and accurately measure soil moisture levels.
7. Use all of your central control's system capabilities.
8. Develop water conservation techniques and guidelines and stick to them.

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