

Personal Computers - A New Chip for the Course

by JAMES FRANCIS MOORE
Director, Mid-Continent Region,
USGA Green Section

AT FIRST GLANCE, micro-computers and the art of golf course management seem to have little in common. The sensitive touch of a superintendent determining soil moisture and the need for irrigation is not the same as the inhuman logic of a semi-conductor. In similar fashion, the ability to sense the likelihood of an outbreak of a particular disease even without the weatherman's sophisticated instruments seems impossible for even the most advanced computer.

Golf course superintendents have been given credit for insight of the workings of Nature. Can this special insight be captured on the magnetic media of a floppy disk and distributed by the computer? Can a clever programmer create a cookbook for the care of a golf course and all it entails? Can you grow bermudagrass in full shade? The obvious answer to all three of these questions is no. However, in growing numbers superintendents employ the computer in their maintenance operations. There are applications where this combination of chips, circuit boards, and plastic excels. The simple truth is, the computer is an excellent tool whose potential is not yet realized.

Actually, computers are not new to the golf course. Superintendents have used less recognizable computers for years. Although the first irrigation controller, made up of springs and gears, bore little resemblance to the sleek desktop machines we see in offices, it, too, was a computer. The argument can be made that pump stations are actually servo-mechanical computers that control pressure and flow to the irrigation system. Pressure switches, relays, timers,



and valves are all decision-making entities — just as is the transistor. Modern pumping plants react to constantly changing parameters quickly and efficiently. They are very computerlike. By strict definition, even the board on the shop wall used to keep track of the maintenance schedule is a form of computer.

Although desktop computers have been in industry for many years, only recently have they shown up in the superintendent's office. This is surprising, since golf course superintendents are notoriously innovative. Many of the new pieces of equipment introduced each year are the offspring of a superintendent's idea. When a maintenance problem is identified, usually some superintendent modifies or builds a piece of equipment suitable to the task.

In recent years the superintendent's role has expanded to include many other responsibilities besides mowing, watering, and fertilizing. His new charges now include budget development and control, personnel management, chemical management and possible environmental impact, and the proper maintenance of equipment inventories that can quickly exceed half a million dollars. Again the superintendent has adapted the computer

as a tool to help him accomplish his goals more efficiently. Superintendents find this new technology can help them to be more efficient, accurate, and effective.

The computer is especially well suited to particular areas of golf course management:

Preventive Maintenance of Equipment

Most superintendents are aware of savings that can be realized by preventive or periodic maintenance. Scheduled maintenance not only reduces down time of equipment, it often significantly prolongs the life of that equipment and results in a tremendous savings to the club. If all the equipment on a golf course was the same, preventive maintenance would be relatively simple to schedule. It is quite common, however, for a course to have 30 or more different types of equipment, each requiring its own schedule. The computer is extremely well suited for such diversified scheduling.

Once the necessary records are entered into the computer, the superintendent can determine what equipment is due for maintenance over whatever period he chooses. Scheduling becomes a simple matter of searching the computer's memory for the equipment due this week

or this month. A search that may take only seconds is as accurate as the information put into the computer.

The list of equipment due maintenance can be printed for the mechanic. Maintenance records are easy to keep and can be as detailed as necessary. Periodic review of such records can often help the mechanic spot trouble before it happens.

If it's wanted, cost of replacement parts, mechanics time, and depreciation can all be monitored to develop the cost-per-hour of operation. All this can be done on paper, but it requires considerably more time, paperwork, and effort.

Budget Development and Control

The term number crunching is used to describe the computer's ability to manipulate budgets. A good budget that provides guidelines for the year's expenditures is flexible. It should be prepared and presented in a professional manner. At the same time, it should be constantly monitored and updated. The computer is better adapted to these criteria than the ledger and the eraser. Budgets can be modified to reflect the current financial state. Projected figures based on current spending allows the superintendent to adjust accordingly. It is a relatively simple matter to determine how much is spent on a particular piece of equipment, with a particular company, or on a specific maintenance task.

Record Keeping

Good superintendents already have detailed records of every chemical application they make. They also record employee performance, purchase orders, daily events, weather information, and a wealth of other data. The collection of this type of information is referred to as a data base. The computer does not necessarily make the recording of this data easier; rather, it allows the extraction of the data according to particular criteria.

Questions like: "How many man-hours have we spent on bunker repair and maintenance?" or "How many air filters part #123 will we need over the coming year?" or "How much nitrogen, phosphorous, and potassium have we applied to #11 green this year versus previous years?" can be answered quickly. Any type of record system should allow you to answer these questions. With a computer you find the answers much easier and faster.

Even the best kept records are of little use if they cannot be found easily. Record

keeping is a task most superintendents do not enjoy. As a result, there is a tendency to keep as few (if any) as possible. Again, the computer can be a big help. Some types of records superintendents are currently using the computer to keep are:

1. Equipment maintenance
2. Pesticide and fertilizer applications
3. Daily maintenance tasks
4. Personnel records
5. Purchase orders
6. Weather information
7. Tournament schedules
8. Irrigation

This list grows as more superintendents acquire computers.

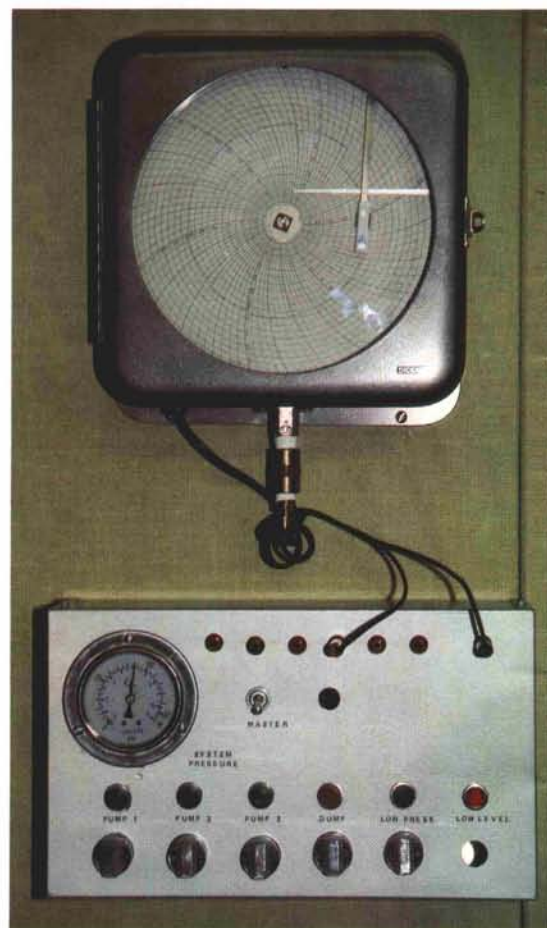
Irrigation Management

Hopefully we are aware of the desperate need to make better use of water, perhaps our most valuable natural resource. The development of automatic irrigation controllers provided a valuable tool for watering the golf course. The computer can now provide far greater control. Instead of merely turning the heads on and off, the computer can provide valuable information about the current status of the irrigation system and produce printouts detailing irrigation practices over specific time periods.

Tracking system pressure can help identify overloaded zones and satellite controller operation. By monitoring the gallon per minute demand and supply, pump station performance can be evaluated throughout the night.

The computer also makes it simple to track how much water is applied to various areas of the course and to shut the irrigation system off if sufficient rain falls during a water cycle. Remote operation of the system is possible through the use of a telephone modem — a device that allows one computer to exchange information with another over the telephone lines. In this manner the system can be shut down or even monitored from the superintendent's home.

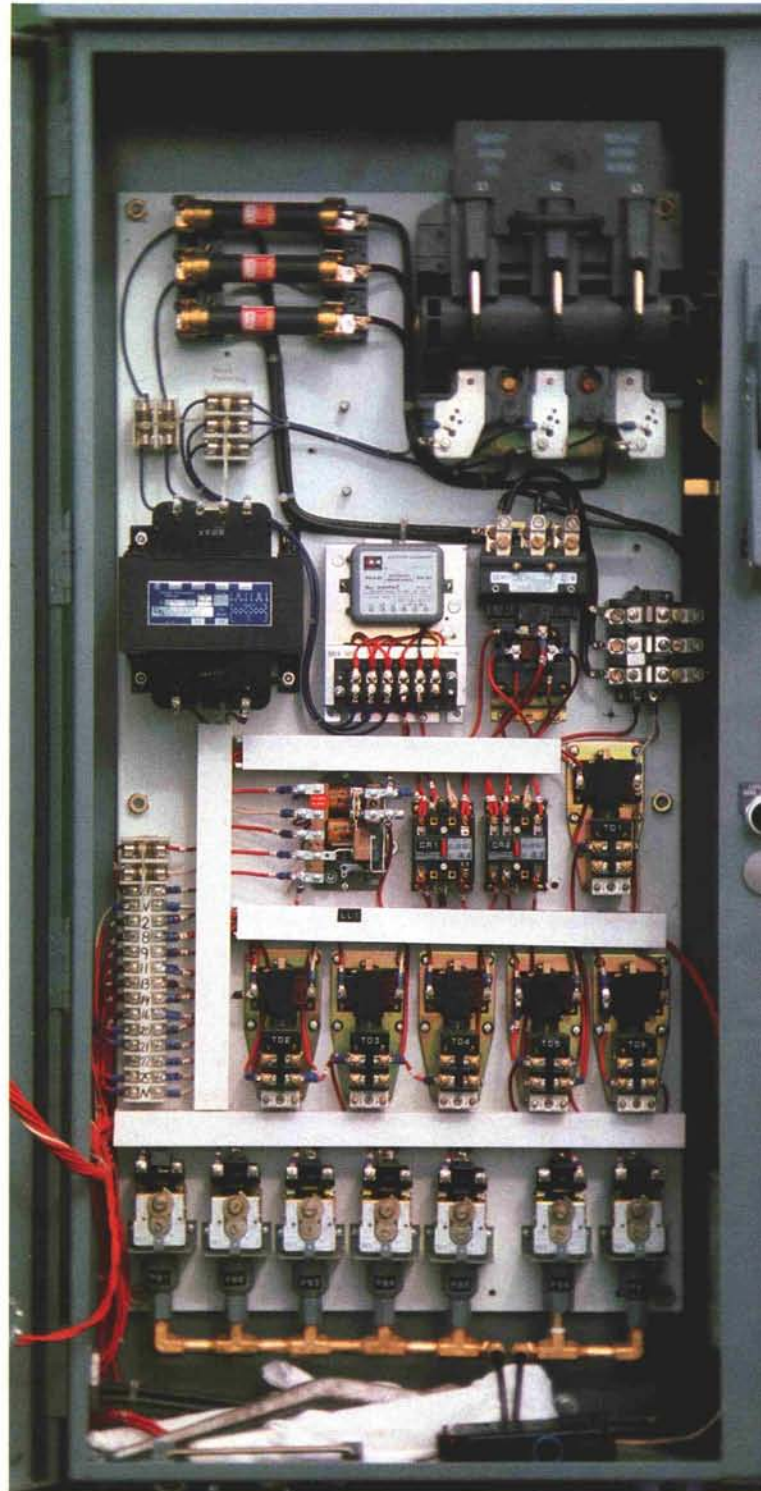
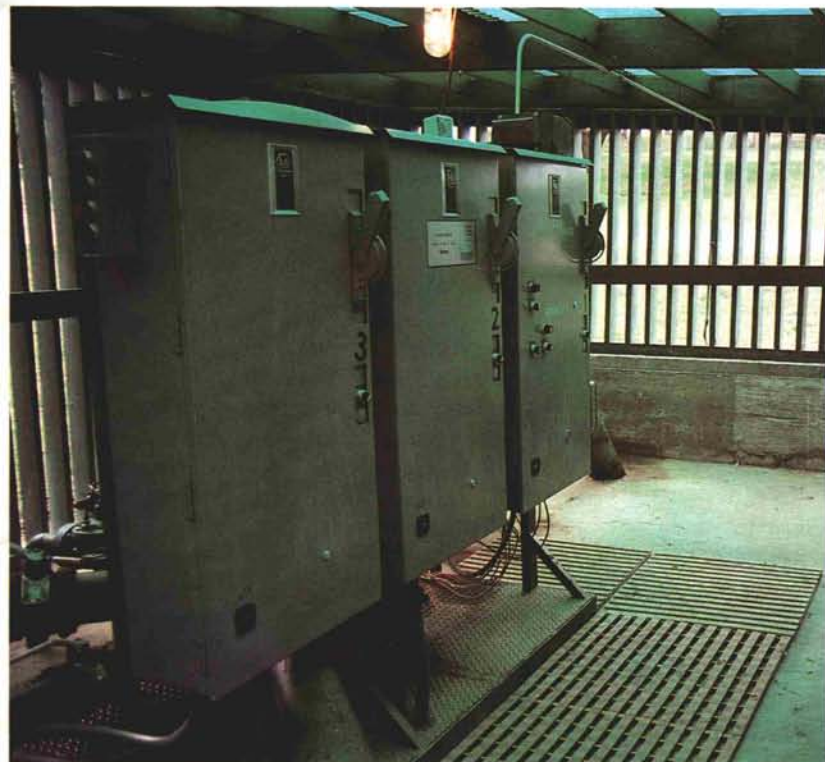
Obviously, the potential for improvement of watering practices is great. Just as great, however, is the possibility of careless water management. Even the best computer graphic display is no substitute for a keen eye and a soil probe. The computer should be viewed as a tool to help improve water management, not as a replacement for common sense. The overused phrase "the computer is down" may work for other industries, but not for the golf course.



Turfgrass Information Center

In the future, the personal computer will connect the superintendent directly to the USGA Turfgrass Information Center, located at Michigan State University. In addition to the extensive O. J. Noer Memorial Turfgrass Collection, nearly all journals and newsletters devoted specifically to turfgrass will be available for review. Information on practically every aspect of turfgrass research and maintenance will be as close as the telephone. The superintendent will be able to locate the most current information on a wide variety of turfgrass subjects.

Another aspect of the service being developed at MSU will be the bulletin board, a program that allows users to trade information through the host computer. This exchange of information and ideas with other professionals should be useful to the turfgrass manager.



*(Opposite page) What did the irrigation system do last night?
(Top, left) Computers can monitor the weather.
(Above) Very "computerlike."
(Left) Pumping stations are a form of computer.*

**STATEMENT OF OWNERSHIP,
MANAGEMENT AND CIRCULATION**

(Act of October 23, 1962; Section 4369, Title 39, United States Code.) 1. Date of Filing — November 18, 1985. 2. Title of Publication — USGA GREEN SECTION RECORD. 3. Frequency of issues — Six issues a year in January, March, May, July, September and November. 4. Location of known office of publication — Golf House, Far Hills, N.J. 07931. 5. Location of the headquarters of general business offices of the publishers — Golf House, Far Hills, N.J. 07931. 6. Names and addresses of Publisher, Editor, and Managing Editor: Publisher — United States Golf Association, Golf House, Far Hills, N.J. 07931. Editor — William H. Bengeyfield, Golf House, Far Hills, N.J. 07931. Managing Editor — Robert Sommers, Golf House, Far Hills, N.J. 07931. 7. Owner (if owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding 1 percent or more of total amount of stock. If not owned by a corporation, the names and addresses of individual owners must be given). If owned by a partner, partnership or other addresses — United States Golf Association, Golf House, Far Hills, N.J. 07931; President — James R. Hand, Golf House, Far Hills, N.J. 07931; Vice-Presidents — William J. Williams, Jr., and William C. Battle, Golf House, Far Hills, N.J. 07931; Secretary — C. Grant Spaeth, Golf House, Far Hills, N.J. 07931; Treasurer — Charles M. Pyle, Jr., Golf House, Far Hills, N.J. 07931. 8. Known bondholders, mortgages, and other security holders owning or holding 1 percent or more of total amount of bonds, mortgages or other securities — None. 9. Paragraphs 7 and 8 include, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, also the statements in the two paragraphs show the affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner. Names and addresses of individuals who are stockholders of a corporation which itself is a stockholder or holder of bonds, mortgages or other securities of the publishing corporation have been included in paragraphs 7 and 8 when the interests of such individuals are equivalent to 1 percent or more of the total amount of the stock or securities of the publishing corporation. 10. This item must be completed for all publications except those which do not carry advertising other than the publisher's own and which are named in sections 132.232 and 132.233 Postal Manual (Sections 4355a, 4344b and 4356 of Title 39, United States Code).

	Average No. Copies Each Issue During Preceding 12 Months	Single Issue Nearest to Filing Date
A. Total No. Copies Printed (Net Press Run)	14,500	14,500
B. Paid Circulation		
1. Sales through Dealers and Carriers, Street Vendors and Counter Sales	0	0
2. Mail Subscriptions	1,800	1,800
C. Total Paid Circulation	1,800	1,800
D. Free Distribution (including samples) by Mail, Carrier or other means	12,400	12,400
E. Total Distribution (Sum of C and D)	14,200	14,200
F. Office Use, Left Over, Unaccounted, Spoiled after Printing	300	300
G. Total (Sum of E and F)	14,500	14,500

I certify that the statements made by me are correct and complete.

Robert Sommers, Managing Editor

Possible Pitfalls

Indeed many uses for the computer are being developed by superintendents, programmers, and industry, but before you purchase a computer, consider the following cautions:

1. Disk drives, keyboards, and printers do not function well in dusty environments. They should be placed in a clean, cool, and comfortable work place. You may find yourself spending quite a few hours setting up your system. Mistakes are easy enough to make without constant interruption and mechanical failure of the equipment itself.

2. Power surges can wipe out hours of work and could result in permanently lost records. Most maintenance facilities include electric welders, compressors, and battery chargers. These items and others can cause significant fluctuations in the line current. A surge protector can provide protection for your files and the computer's delicate electrical components. Static electricity can also cause major problems for your system. Inexpensive grounding mats provide excellent protection.

3. Do not expect to benefit from the computer immediately. Preparing and entering the information is time consuming. Learning to use the computer is not difficult, but is absolutely mandatory, especially when it comes time to deal with the glitches that invariably develop. Allow plenty of time to develop your system, time to change it, and time to change it again.

4. Also, be sure to allow plenty of time in your schedule (or your assistant's or secretary's) for the constant entry and updating of your records. The computer slogan "garbage in - garbage out" is appropriate. Remember that computers have no common sense and are only as good as the information you supply.

5. Keep only pertinent and valuable records. Superintendents find themselves spending hours accumulating information that may make impressive graphs but have little practical value. Used properly, the computer can free many hours of your time for other things. However, it is not uncommon for a person to become so interested in the machine and its uses, they spend whatever free time they have developing new records to keep.

Conclusion

Are you a candidate for a computer? Ask yourself the following questions:

1. Do you keep good records now? If not, don't expect a machine to change your ways. It can help organize your

methods, but it can't enter the information for you. If you have tried to keep records but never seem to have time to write the information, you probably will not have time to type it either. If your problem is finding the necessary information when you need it, the computer is the right tool.

2. Do you know enough about the machine and its abilities to make a wise purchase? Unless someone is available who knows exactly what your requirements are, you will have to determine what equipment is right for your situation. Be prepared to learn a new language. Most computer salesmen know as little about maintaining a golf course as superintendents know about computers. Don't expect to find the right machine the first time you walk into the store. Do expect to find someone who is convinced he has the right machine for you. The best bet is to contact other superintendents using computers in their operation. Resist the temptation to buy quickly.

3. Have you identified exactly what you intend to use the computer for? This can be very difficult to someone new to computers. How do you identify these areas if you don't know what the machine is capable of doing? Software (the programs that actually run the machine) is as important as the equipment itself.

A number of programs could be right for you. Software is available written specifically for the golf course. These programs allow you to be up and running in a relatively short time. However, they are somewhat limited in that you must rely on someone else's ideas of what applications you need.

Many programs are not industry specific and extremely versatile; using these programs, you develop the applications specific to your operation. To do so, however, you must become proficient with the program (you do not have to become a programmer). This will require time, effort, and patience. Budgeting (spreadsheets), filing (data base management), and word processing programs are available. Finding the one best suited to your operation can be difficult. Again, contact others for their opinions.

It has often been said that being a good golf course superintendent requires a special blend of art and science. There are aspects of managing a golf course that cannot be learned in school, written down in a book, or stored into a computer's memory. These skills require both hard work and time. Technology, however, has always been important in our industry. The computer is a promising new tool.