A BRIEF HISTORY OF COMPUTERS

By Dennis Thorp

Editor's Note: We are introducing a new feature for the Grass Roots and reintroducing a former member of our profession. Dennis Thorp is a 1971 graduate of UW-Madison and was one of the first students to start and finish under J.R. Love in the Turf Management Program. He left the profession in 1975 and is now returning to it. During his absence, he gained extensive experience with microcomputers. He purchased an Apple computer in 1979 and has worked both in sales and consulting. He is currently employed by Blackhawk Country Club.

There is a growing interest in microcomputers among Golf Course Superintendents. One has only to look to the literature of our own industry to see the number of articles about computers or references to their use. But there seems to be an absence of hard information on "how to use" and "what to do with" a computer once a superintendent has decided to jump into this field. As if there was not enough to do as agronomists, purchasing agents, personnel managers, public relations experts, etc., now we are expected to master another technology. The purpose of this column is to give some sound advice on what to buy as far as hardware and software and how to use it once you have it. We will attempt to answer any questions as they come up or at least point you in the right direction to find a solution. For those who have computers gathering dust in a corner, we offer a ray of hope.

The first outline of what eventually became the modern computer was created by an Englishman in the 19th century. But he was limited by the technology of his time and his dream was not realized until some 70 years after his death. The first operational electronic digital computers were developed during World War II. The British developed a series of computers to crack German codes and materially contributed to victory in the war. Americans plunged into action two years after the British when a project was initiated to develop a machine to help "compute" firing tables for the military. Mathematicians were employed to manually calculate firing data, and since over 500 factors had to be accounted for in each calculation, it could take up to three months to solve each problem. Hundreds of people were employed by the government to produce their tables and rush the information to the battlefield. A project was funded to produce a machine to solve these mathematical problems, but it was not completed until 1946. ENIAC was born—Electronic Numerical Inter Active Calculator or something like that. Too late for World War II, but a new industry was created.

About this time, the first "bug" was discovered. The early computers were room-sized devices with thousands of vacuum tubes and very critical cooling requirements. As Grace Hooper, a recently retired Navy Admiral, tells the story, she was working on one of the first machines and it began to behave erratically. The technicians were confused and checked the machine for days. Finally, a large moth was discovered deep inside the machine, shorting out some circuits. Forevermore, when a computer or piece of software behaves in an unexpected or erratic manner, it has been said to have a "bug" in it and the process of finding and fixing it has been called "debugging".

We will move forward to the 1960's. Transistors have been invented and computers are becoming smaller and more accessible. They still do not have display screens or keyboards. Instructions are entered by means of a paper tape with holes punched into it and output was delivered in a similar manner. But some students at MIT began to experiment with one. They were members of the model railroad club at the university and their passion was figuring out how things worked. Before the computer arrived they would spend hundreds of hours rewiring the switches on their railroad layout. Beneath the racks were miles and miles of wire leading to the various switches. As they experimented with the computer, they found amazing similarities between the switches and wiring of the railroad setup and the computer. If anyone takes a close look at the main board of a microcomputer and forgets all the jargon, it is only a series of wires running from point to point. Some early boards actually had wires soldered in to correct designing flaws. Taken in its simplest form, that is all a computer is: a series of switches that are either on or off. It works on the binary codes (Base 2) that some of us learned as the "new math" of the 1960's-1's and 0's. "1" is on and "0" is off. What they discovered is that by changing the wiring, they could change the function. This was a very radical thought for this time, when computers required special environments and only a very select few people would have access to them.

Now we will jump to the mid-1970s. A garage near San Francisco is the site for Steven Jobs and Michael Wozniak to invent and begin to ship Apple computers. They tied the floppy disk disk drive to the microcomputer and used a television set for a display screen, but they did something even more dynamic. They conceived the theory of "open architecture": the hardware had slots for aftermarket plug-in devices that users could install to make the computer do different things. Radio Shack, Commodore and other early microcomputer manufacturers restricted the market to devices that they designed and sold. Since all ingenuity did not reside within those companies, end users found that the Apple was more flexible. This translated into more sales. When IBM entered the market, they followed the "open" route. This was a departure from their previous corporate policy of requiring that

everything installed into or on one of their computers only come from IBM. "Open architecture" greatly increased the speed with which microcomputers became accepted by the general public.

There was still one element missing. No matter how sophisticated the hardware is, without instructions (program, software) the computer is only good at being a boat anchor or door stop.

Let's go to MIT where the first widely-used, general purpose software was written: VISICALC. Before this time, a user had to be a programmer or buy a program that would only do one specific task. The relative simplicity of Visicalc opened the door to wide use and acceptance. This piece of software did more than anything else to put microcomputers on the desks of businessmen. It was no longer a toy or curiosity, but a way to use information at the lowest possible levels. Visicalc led to Lotus 1-2-3 which led to Symphony which led to ?. Once the hardware was widely accepted, everyone jumped on the bandwagon and the microcomputer revolution was here.

All this history is nice to know, but isn't much help to the superintendent who has a computer gathering dust or is contemplating a purchase. Read the articles in the November 1987 issue of *Golf Course Management* for more general information. What we hope to accomplish here is to give specific recommendations on hardware and software. Future articles will deal with the "nuts and bolts" of electronic spreadsheets, word processing, data base management and telecommunications. We will review various pieces of software and tell you how to get up and running with some of the most popular ones. Those of you with specific questions are encouraged to write letters to the editor and I will do my best to answer them. Some of you may even be able to give me a clue as to what topics would be most interesting to our readers. We will try not to get too tied up with the jargon of the industry, other than to tell you enough about RAM and ROM, bits and bytes so that you can be considered "computer literate".

The tentative topic for the next issue is: "Hardware—what to buy and how much to spend."