NEW CONTROL SYSTEM FOR GREENHOUSES

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One of the booming areas in computers are programmable controllers or "PCs". PCs are small computers that can be programmed to actuate several other devices or **implementation** systems to operate a manufacturing process. In the case of greenhouses, this would be temperature, humidity, CO_2 levels, etc. These systems have considerable potential for technological advance in greenhouses, and Europeans are further ahead, having studied application for several years. However, their computer facilities may not be as advanced as ours.

I was able to spend a day with Oglevee Associates in June at Connellsville, PA (Fig. 1), to look at their new programmable control system for greenhouses (Figures 3 and 4). The system represents a change from existing "staged" controllers where the control requires a temperature difference from the set point to turn on, or off, the various parts of the implementation system (fans, heaters, steam valves, etc.). The magnitude of the difference determines the number of stages actually on. Oglevee's system integrates the temperature sensed from one or more locations over time, and the result is used to change the implementation system in order to return temperature to the set point. Thus, this newer system will tend to maintain the set temperature, whereas existing systems may operate above or below the set point, depending upon magnitude of the heating or cooling loads. Miniaturization permits several inputs to be used to control temperature, dehumidification cycles, etc., and to

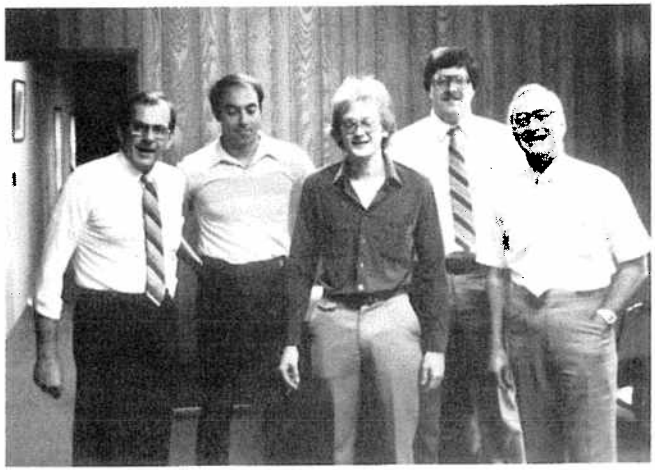

Figure 1: Part of the headquarters group at Oglevee Associates in Connellsville, PA. From left to right, Bob Oglevee, Randy Love (engineer), Kirk Oglevee (programmer), Dick Oglevee, and Jim Tammen (President of Oglevee Associates). Jim was, for several years, pathologist at Pennsylvania State University, and was instrumental in clean stock programs for the industry. He was later Experiment Station Director at the University of Minnesota before joining Oglevee's.

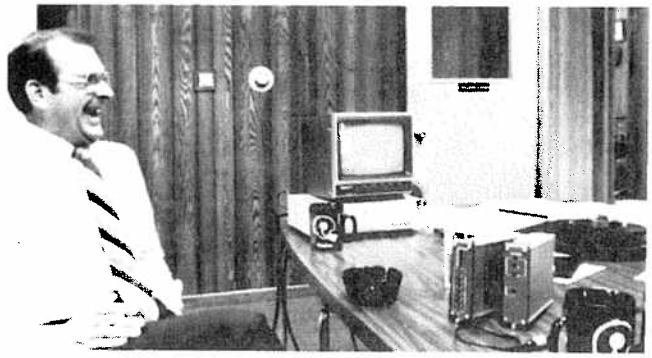

Figure 2: Bob Oglevee amused. On the table are two electronic plug-in units for environmental control. Bob is instrumental in clean-stock programs for geraniums and has managed to keep the majority of the family interested and devoted to the greenhouse business.

Figure 3: Two greenhouse module controllers. Set points, control points, integration, etc. can be set from these units.

Figure 4: The little unit to the left of the CRT (cathode ray tube) and Apple II Computer is the programmable controller in a configuration for experimentation. The system gives input readouts (temperature, light intensity, wind, humidity, etc.) on the CRT. These may be instantaneous, averaged, programmed to give maximum or minimums, etc.

set the temperature in accordance with outside climate conditions.

A few of these systems have been installed in commercial ranges, and we can expect one in the Denver region sometime this winter. Hopefully, CSU may have one for tests to compare with conventional thermostatic and staged control systems. Certainly, PCs offer the opportunity for increased flexibility in operation and should give increased energy efficiency if handled correctly.