# Table of Contents

<table>
<thead>
<tr>
<th>Description</th>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>System Overview/Getting Started</strong></td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Devices and Definitions</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>System Overview</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Intro to Programming</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Getting Started</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>Start Up</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>Assigning Communication Ports</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>Designating System Device Type</td>
<td>13</td>
<td></td>
</tr>
<tr>
<td>Setting Up System Data Tables</td>
<td>18</td>
<td></td>
</tr>
<tr>
<td>Defining Multiple Courses</td>
<td>23</td>
<td></td>
</tr>
<tr>
<td>Defining Special Areas</td>
<td>24</td>
<td></td>
</tr>
<tr>
<td>Default Course Data</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>Default Sprinkler Data</td>
<td>28</td>
<td></td>
</tr>
<tr>
<td><strong>Creating a Map of Your Course</strong></td>
<td>2</td>
<td>31</td>
</tr>
<tr>
<td>Scorecard Map Creation Method</td>
<td>33</td>
<td></td>
</tr>
<tr>
<td>Import File Map Creation Method</td>
<td>34</td>
<td></td>
</tr>
<tr>
<td><strong>Course Data Builder</strong></td>
<td>3</td>
<td>44</td>
</tr>
<tr>
<td>Hole Markers/Numbers</td>
<td>46</td>
<td></td>
</tr>
<tr>
<td>Area Markers/Numbers</td>
<td>47</td>
<td></td>
</tr>
<tr>
<td>Predefined Other Area Markers/Numbers</td>
<td>48</td>
<td></td>
</tr>
<tr>
<td>Creating New Areas</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>Station Assignments</td>
<td>54</td>
<td></td>
</tr>
<tr>
<td>Adding Sprinklers to Defined Stations</td>
<td>57</td>
<td></td>
</tr>
<tr>
<td>System Layers</td>
<td>59</td>
<td></td>
</tr>
<tr>
<td><strong>Flo Manager/Data Builder</strong></td>
<td>4</td>
<td>60</td>
</tr>
<tr>
<td>Adding a Pumping Station</td>
<td>62</td>
<td></td>
</tr>
<tr>
<td>Adding Branches</td>
<td>64</td>
<td></td>
</tr>
<tr>
<td>Adding FloZones</td>
<td>68</td>
<td></td>
</tr>
<tr>
<td>Assigning Stations to a FloZone</td>
<td>72</td>
<td></td>
</tr>
<tr>
<td>Reviewing Station Properties</td>
<td>75</td>
<td></td>
</tr>
<tr>
<td><strong>Group 3 Toolbar Access for Stratus™ II/Nimbus™ II Users</strong></td>
<td>78</td>
<td></td>
</tr>
<tr>
<td>Pumps</td>
<td>78</td>
<td></td>
</tr>
<tr>
<td>Branches</td>
<td>80</td>
<td></td>
</tr>
<tr>
<td>FloZones</td>
<td>81</td>
<td></td>
</tr>
<tr>
<td>Stations</td>
<td>82</td>
<td></td>
</tr>
<tr>
<td>Description</td>
<td>Section</td>
<td>Page</td>
</tr>
<tr>
<td>--------------------------------------------------</td>
<td>---------</td>
<td>------</td>
</tr>
<tr>
<td><strong>Station Detail Table/Program Builder</strong></td>
<td>5</td>
<td>83</td>
</tr>
<tr>
<td>Station Detail Table</td>
<td></td>
<td>84</td>
</tr>
<tr>
<td>Controller Data (Satellite System)</td>
<td></td>
<td>85</td>
</tr>
<tr>
<td>Decoder Data (Decoder System)</td>
<td></td>
<td>86</td>
</tr>
<tr>
<td>Run Time Data</td>
<td></td>
<td>87</td>
</tr>
<tr>
<td>Sprinkler/Rotor Data</td>
<td></td>
<td>88</td>
</tr>
<tr>
<td>Flo-Manager Data</td>
<td></td>
<td>89</td>
</tr>
<tr>
<td>Precipitation Data</td>
<td></td>
<td>90</td>
</tr>
<tr>
<td><strong>Program Builder</strong></td>
<td></td>
<td>91</td>
</tr>
<tr>
<td>Add Program</td>
<td></td>
<td>91</td>
</tr>
<tr>
<td>QuickIRR Method</td>
<td></td>
<td>92</td>
</tr>
<tr>
<td>Standard Method</td>
<td></td>
<td>95</td>
</tr>
<tr>
<td>Add Schedule</td>
<td></td>
<td>96</td>
</tr>
<tr>
<td>Standard Method</td>
<td></td>
<td>98</td>
</tr>
<tr>
<td>Starting or Stopping a Program or Schedule</td>
<td></td>
<td>102</td>
</tr>
<tr>
<td><strong>System Operation</strong></td>
<td>6</td>
<td>103</td>
</tr>
<tr>
<td>Course Monitor/Manual Operation</td>
<td></td>
<td>104</td>
</tr>
<tr>
<td>Manual Operation from Front Office screen</td>
<td></td>
<td>108</td>
</tr>
<tr>
<td>Start an Individual Valve from “Monitor Log/DMA” screen</td>
<td></td>
<td>109</td>
</tr>
<tr>
<td>System Indicators</td>
<td></td>
<td>111</td>
</tr>
<tr>
<td>System Settings</td>
<td></td>
<td>119</td>
</tr>
<tr>
<td>Simple-IRR Operations</td>
<td></td>
<td>134</td>
</tr>
<tr>
<td><strong>Miscellaneous Functions</strong></td>
<td>7</td>
<td>135</td>
</tr>
<tr>
<td>The Freedom System</td>
<td></td>
<td>136</td>
</tr>
<tr>
<td>System Information</td>
<td></td>
<td>144</td>
</tr>
<tr>
<td>Database Utilities</td>
<td></td>
<td>145</td>
</tr>
<tr>
<td>Cost Estimate</td>
<td></td>
<td>151</td>
</tr>
<tr>
<td>Designer Notes</td>
<td></td>
<td>153</td>
</tr>
<tr>
<td>Access to System Tests</td>
<td></td>
<td>154</td>
</tr>
<tr>
<td>Smart Sensors</td>
<td></td>
<td>161</td>
</tr>
<tr>
<td><strong>Weather Program/Smart Weather</strong></td>
<td>8</td>
<td>165</td>
</tr>
<tr>
<td>Weather Program</td>
<td></td>
<td>166</td>
</tr>
<tr>
<td>Manual ET Data Entry</td>
<td></td>
<td>168</td>
</tr>
<tr>
<td>Weather Station Configuration</td>
<td></td>
<td>172</td>
</tr>
<tr>
<td>Weather Station On-Site</td>
<td></td>
<td>172</td>
</tr>
<tr>
<td>Monitor Weather Station/Download W/S Data</td>
<td></td>
<td>174</td>
</tr>
<tr>
<td>Smart Weather</td>
<td></td>
<td>179</td>
</tr>
</tbody>
</table>
SECTION 1

System Overview
Getting Started
The central computer uses the Cirrus™/Nimbus™ II/Stratus™ II Software in the Microsoft Windows environment. The computer communicates directly to the Interface unit, which controls all other devices in the system. The central equipment includes:

- **Central Processing Unit (CPU)** - The cabinet that houses the disk drives, electronic circuit boards and communication ports.

- **Communication Ports** - Connections on the rear of the computer cabinet are attached to external devices such as the Interface Module, Weather Station, Freedom Unit, modem phone lines, printers, etc. There are both “Parallel” and “Serial” ports. Printers usually connect to a parallel port, while Interface units, Weather Station, Freedom Unit, etc. connect to the “Serial” ports (referred to as “COM” ports).

- **Interface Unit** - The Interface unit for the Satellite-based systems will be either a MIM or TWI unit for the “hard wired” satellite system or a MIM-LINK or TWI-LINK unit for the “wireless radio” satellite systems. The decoder-based systems will use the MDI, LDI, or SDI Interface unit.

In the “hard wired” satellite system the MIM or TWI Interface unit communicates to the field satellite units by means of a 2-wire path.
In the “wireless radio” satellite system the MIM-LINK or TWI-LINK Interface unit communicates to the LINK type field satellites by means of radio transmitted signals.

In the Decoder-based system the MDI, LDI, or SDI Interface unit communicates to the field Decoders by means of a 2-wire path.

- **Printer** - The device that prints reports and other information on paper.

- **Monitor** - The screen that displays the software as it is being programmed or as the system operates.

- **Keyboard** - The typing device that allows the user to enter text and other data into the computer software.

- **Mouse** - The device that allows one to move a pointer (cursor) around on the screen in order to select items or enter commands or other data.

- **Freedom Repeater unit** - The Interface unit of the computer providing remote “hand-held” radio control of the system from the field.

The following is a list of other system equipment used:

- **Satellites** - Field units that directly operate the remote control valves or the valve-in-head sprinklers automatically from the central equipment or manually at the satellite itself.

- **Decoders** - Electronic Field units (FD-101, FD-201, FD-202, FD-401, or FD-601) that directly operate the remote control valves or the valve-in-head sprinklers.

- **Valve-in-head Sprinklers** - Rotors with built-in valve assemblies and actuators for direct operation by the Satellite outputs or Decoder outputs.

- **Remote Control Valves** - Control valves for control of the Rotor Sprinklers, usually in batteries or groups.

- **Hand-held Radio** - Provides for remote field control of the software system.

- **Field Transmitter** - Provides for remote field control of the software system on the Decoder-based systems only.
The mouse may be awkward for some novice computer users. However, with a little practice, "pointing" and "clicking" to choose items on the screen with the mouse becomes second nature.

In this manual, we refer to certain terminology to describe functions performed with the mouse. These items are:

**ICON**

An "icon" is a picture or symbol displayed on the screen that represents a function or action of the program. Clicking on the icon provides access to the function.

**LEFT – “Click”**

To “left-click,” or normally just referred to as “click,” means to press the left button on the mouse. Depending on where the mouse pointer is on the screen, clicking may select an item, confirm a choice, or exit from the program.

**RIGHT- “Click”**

To “RIGHT-click” means to press the right button on the mouse. This will generally result in a “drop-down” screen being displayed giving additional information and data on the item selected.

**DOUBLE-“Click”**

“Double-clicking” is a short-cut method of selecting and starting a function. Double-click by pressing the left mouse button twice in rapid succession. For example, the software program is started by double-clicking on the software icon in the Program Manager screen or Windows Desktop.

**“DRAGGING”**

“Dragging” is a way of moving items around on the screen. To drag an item, place the mouse pointer over it, press and hold the left mouse button and “drag” the item to a different location. Then release the left button to drop the item at this location.
Cirrus/Nimbus II/Stratus II software supports operation of either a satellite-based system or a decoder-based system. The differences between these types of systems are described below.

**SATELLITE SYSTEMS**

Direct Communication - “Hard Wired” system - A typical direct communication, satellite-based system includes a central computer connected to an Interface Module (MIM or TWI unit). The Interface unit communicates over a 2-wire path to various remote satellite controllers in the field. This controls the remote control valves or the valve-in-head sprinklers.

Wireless Radio Communication - A typical radio communication, satellite-based system includes a central computer connected to a wireless type Interface Module (MIM-LINK or TWI-LINK). The Interface unit communicates via radio transmission signals, to various remote LINK type satellite controllers in the field. This controls the remote control valves or the valve-in-head sprinklers.

**DECODER SYSTEMS**

A typical decoder-based system includes a central computer connected to a Decoder Interface Module (MDI, LDI, or SDI). The Interface unit communicates over a 2-wire path to various remote decoder units in the field. These decoder units directly control the remote control valves or the valve-in-head sprinklers.

**Software**

The software runs in the Microsoft Windows environment. Windows is a graphical display environment that is designed to make interaction with the computer easy. It is important to be familiar with Windows-based software in order to be comfortable. A built-in Windows tutorial is available. To access it, click on Start, Programs, Accessories, System Tools, and Getting Started.
Introduction to Programming

The Central software controls irrigation activities through spreadsheet analysis for up to three (3) independent 18 holes (Stratus II software controls up to 27 holes). The software is divided into a number of “main” sections, which will be described below.

Front Office

All of the “operational” functions for the system are initiated from the “Front Office” screen. The toolbar, because of the number of items presented, is broken into three (3) separate groups.

It is recommended to spend some time in becoming familiar with the various icons presented here, as well as other features and information of the system.

GROUP 1 TOOL BAR
GROUP 2 TOOL BAR

Tool Bar Group Being Displayed

GSP Enhancements
Software Module Options
Help
Designer Notes
Information Data
Cost Estimate Calculator
Database Utilities
Freedom System Data
System “Start Up” Procedure

GROUP 3 TOOL BAR

Tool Bar Group Being Displayed

Smart Pager
Smart Sensors - User defined sensor reactions
Flo-Manager
System Testing Access - Requires password entry
Printer Office - User defined report capabilities
The various principal areas concerned with this section are as follows:

1. Gather the necessary field information and enter it into the work sheets.
2. Enter the initial, general information of the course.
3. Enter the “default” information for the general areas to be irrigated.

Below are short explanations of what the other sections will provide.

♦ Once the above steps have been completed, move on to Section 2 which covers how to Create and/or Import a map.
♦ After the map is complete, move on to Section 3 for directions about inputting course data onto the map.
♦ Section 4 provides information about inputting all of the Flo-Manager® information in the map utilities section. The Flo-Manager® data can also be completed from the front office within the group 3 toolbar.
♦ There are two ways to enter Station Data and create Programs/Schedules for the irrigation system. Section 5 reviews this process through the Map Utilities area. This can also be completed from the Front Office Toolbar in group 1.
♦ Automatic operation and/or manually operating the system according to the course’s needs is reviewed in Section 6. The system automatically performs “log” operations, flow charts and graphs and other special functions of the system’s operation on a day to day basis. This is also reviewed in Section 6.

NOTE !

“HELP” screens are accessible for the various functions, which will provide “on screen” detailed information about the function and how to enter data for it.
The “Start Up” process will provide for the entry of general information about the course. The data entered should reflect general conditions or the most prevalent data for each of the specific areas of the course. Much of the data that is entered will be the default data that the system will use in the programming process. Don’t be concerned that it may not be correct for all stations of a given area. Individual station data can always be changed later when “fine-tuning” the information during daily operation of the system.

To START the “Start Up” process - click on the icon at the top of the “Front Office” screen.

**Language**

Select the Language to be used for the system. The system default is English. Click on Continue to proceed to the next screen.
Course Information

This screen provides for the entry of the names of the course. Programming of up to three (3) 18-hole courses is possible. **Note: For Stratus II customers only two (2) courses are possible – up to 27 holes.** The course name that is entered here will become Course #1. If there is more than one 18-hole course, the individual 18 holes will be referred to as “Course 1,” “Course 2,” and “Course 3.” In addition, each can include further identification, such as: Course 2 - South Course, Course 3 - Gold Course, etc.

Start Up Process Instructions

This screen displays general instructions about the Start Up process.
Select Measurement Units

This screen allows the user to select the units of measurement to be used in the system. The default setting is for US Units, Gallons per Minute - GPM. Other choices are: Cubic Meters per Hour (m3h), and Liters per Second (l/s). Click on desired measurement, then click Continue.

Enter System Capacity

This screen provides for the entry of the total capacity of the system’s water source. It will be expressed in the measurement unit selected in the previous screen.

If the system uses pumps, the capacity entered should represent the total capacity of ALL pumping stations. If municipal water is used or some other sources of supply, enter the total capacity for ALL meters or sources of supply.

NOTE: Please read the note shown on the screen carefully.
FloGuard manages the demand of the system, based solely on the total system capacity, by arbitrarily spreading the demand over the entire course. This method is used in the absence of a Flo-Manager database.

Flo-Manager manages the demand based on source characteristics described as pump station capacity and optimum step levels. Second, it takes into account the piping distribution network, described as Branches and FloZones. Therefore, it requires a complete Flo-Manager database, which will be established later in the programming process.

Assignment of Communication Ports

Designate which communication (COM) serial ports on the computer are either being used or will be used for communication between the computer and the following devices:

**Field Interface Unit** - MIM or TWI for “hard wired” (2 wire) satellite systems or MIM-LINK or TWI-LINK for “wireless” radio satellite systems. MDI, LDI, or SDI for 2-wire decoder systems.

**Freedom System** - Central Repeater unit, on any of the 3 systems above, for remote control of the system from the field.

**Weather Station** - PRO Weather Station, on any of the 3 systems above, for automatic adjustment of the system based on weather conditions. **Not applicable for Stratus II software users.**

![Image of communication port assignment](image)

Although the serial ports are commonly used as indicated, it is possible to use COM serial ports in various other combinations for these devices. Any ports that are not used should be designated as “Not Assigned.”

For “DEMO” operation, designate all ports as “Not Assigned.”

Designating System Device Type
At this screen, designate the “TYPE” of system that is being used by clicking in the designated square. There are three system types to choose from: “hard wired” (2-wire) satellite system, “wireless” (radio) link satellite system, or a 2-wire decoder system (a wireless rotor system will be available in the future).

**“HARD WIRED” AND LINK SATELLITE DEFINITION**

Once you chose either the “Hard Wired” or Link system, a small box with three periods will appear in the right-hand corner. Click on this box and a drop-down screen will be displayed to provide for the entry of data in regard to the various satellites located on the course. The software system can control up to eight (8) independent groups for the 2-wire system (**two (2) independent groups for both the 2-wire and the link system for Stratus II**) and 4 for the link system. Each path is capable of controlling up to 28 - 24 station satellites. Each satellite will be programmed to respond to one of twenty-eight (28) channels available. A satellite of greater than 24 stations will automatically require two (2) channels; one for the first 24 stations and a second channel for the remaining stations.
Click on cell, then click on arrow to select Satellite Model Type

Satellite Model Type Selection Drop-Down Screen

Satellite Channel Number

Specify # of stations to allow to operate simultaneously
Default = 1

View Devices by channel

Specify max.# of solenoids to operate simultaneously
Default = 6

Click on OK, then on Continue

Rate of communication data being fed to field satellites

Designer Notes on Meter Max. definition

Click on the ? button to display the screen below
a) Chose the “Decoder” type system by clicking in the designated square (see picture on page 14)

b) Click on the small square that appears in the right hand corner that has three periods in it. The following drop-down screen will appear. This display provides the means for establishing different “switch codes” as may be required. A maximum of 20 “switch codes” may be established. In addition, this screen provides for specifying the Maximum Number of solenoids that will operate simultaneously.

Default “Switch Code”

Enter new “switch code” by “clicking” on box, then entering “switch code” according to table shown below

Maximum number of solenoids that can operate simultaneously
Default = 20

Click on OK, then on Continue

*Do Not exceed the system’s maximum capacity based on wire run length & configuration.

For a decoder to actuate a solenoid, it must apply a certain initial voltage for a specific amount of time. This voltage and time will vary according to the solenoid design and construction. The control of this voltage and the timing is done by the central software, through a means referred to as a “Switch Code.” The “switch code” for a Rain Bird solenoid is 59FA50. If other manufacturer’s solenoids are involved, they may require a higher initial voltage for a longer period of time.
Adjusting “Switch Code”

Activating Voltage for Solenoid Activation

In the beginning, the voltage must be “HIGH” (Va) in order to make the mechanical parts move. When the solenoid has activated and the valve is open, it is normally possible to lower the voltage (Vh) and still keep the solenoid in the activated condition.

When a solenoid/valve does not work with the standard code, there are two properties that may need to be changed.

**Solenoid Does Not OPEN (activate) at All!** The activation time (Time 1) needs to be increased. Therefore, change the fourth (4th) digit of the code according to the table below. Use the “trial & error” method until the value works.

**Example:** Try - Activation Time @ 40 ms & keep holding voltage @ 2.3 volts
Code is then - 59F450

**Solenoid OPENS (activates) but Does Not Stay Open!** The holding voltage (Vh) is too low and needs to be increased. Change the fifth (5th) digit of the code according to the table below. Once again, use the “trial & error” method until the value works.

**Example:** Try - Activation Time @ 50 ms & holding voltage @ 5.2 volts
Code is then - 59F5A0

Refer to Table on the next page!
## Electrical Switch Code Required for Magnetic Solenoids

<table>
<thead>
<tr>
<th>Time 1 in ms</th>
<th>*</th>
<th>*</th>
<th>Vh in volts</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>3</td>
<td>3</td>
<td>1.2</td>
</tr>
<tr>
<td>40</td>
<td>4</td>
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<td>100</td>
<td>A</td>
<td>A</td>
<td>5.2</td>
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<tr>
<td>110</td>
<td>B</td>
<td>B</td>
<td>5.8</td>
</tr>
<tr>
<td>120</td>
<td>C</td>
<td>C</td>
<td>6.3</td>
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<td>D</td>
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<td>140</td>
<td>E</td>
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<tr>
<td>150</td>
<td>F</td>
<td>F</td>
<td>8.1</td>
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</tbody>
</table>

**TABLE FOR SELECTING SUITABLE ELECTRICAL CODE FOR SPECIAL SOLENOID TYPES**
Setting Up System Data Tables

This next screen provides the capability of setting up various Data Tables with data that will be used during programming and operation. The following tables can be set up; the ET Adjust Factor Table, the Cycle Time Table, the Soak Time Table and the Precipitation Data Table.

Important:

It is recommended to fill in these tables at this time, so that they can be referenced, when filling in the Default and/or station specific database data. Using these table references rather than “hard” values will make “sweeping” changes easier to perform later - i.e. affecting large numbers of stations with one change as opposed to making a number of changes by individual station.

Click on set up button to complete these data tables.
**ET ADJUST TABLE**

The drop-down screen displayed allows for setting up of data, for the automatic adjustment for each station to meet the climatic conditions, plant types and maintenance procedures, and other factors that may require some adjustment to be made to the system ET value to satisfy its own particular Micro-Climate conditions.

A maximum of 100 ET Adjust table entries or values may be set up. Enter a name and percent adjustment factor for each. Then, refer to one of the table entries for the ET adjust value for each station requiring adjustment.

*To select another data table, click on the arrow button. Click the desired data table from the list on the “drop down” screen presented.*

**NOTE:** Make sure to enter all percentages as a whole number, i.e. 25 = 25% and 2 = 2%. If the percent is entered as a decimal - as .85 for 85%, the table will round off the number to a whole number and input a 1, for 1% into the table.
**STATION CYCLE TIME TABLE**

The Cycle Time Table provides for adjusting each station’s maximum water application time (in minutes) to be within the infiltration rate of the soil in that area, and should reflect the intake water rate of the soil, considering slope conditions and soil types. This Cycle time in conjunction with the Soak time, for each station, will assure that the water applied to the area will be absorbed by the soil and not cause “runoff” or “puddling” in the area.

A maximum of 15 Cycle Time groups may be established. Enter a name and the maximum cycle time (in minutes) for any **ONE application** of water to the area.

*Click on Arrow and select Cycle Time Table from “drop-down” screen*

*Click on cell to enter Cycle Time - in minutes*

*Click on the cell to enter a Cycle NAME*

*Click on cell to enter a Cycle NAME*

*Cycle Time Table*

*Click OK to store the data and return to start-up process or click on drop-down arrow to access another data table*
**STATION SOAK TIME TABLE**

The Soak Time Table provides for establishing the minimum time that must elapse between applications of water to a given area. This Soak Time in conjunction with the Cycle Time assures that all water applied to the area will be absorbed by the soil and will prevent the conditions of “runoff” or “puddling” in the area.

A maximum of 15 Soak Time groups may be established. Enter a name and the minimum soak time (in minutes) that **MUST** occur between applications of water to this area.

Click on cell to enter Soak Time - in minutes

Click on the cell to enter a Soak NAME

Click OK to store the data and return to start-up process or click on drop-down arrow to access another data table
The Precipitation Data Table provides for entering sprinkler data, spacing pattern, spacing, GPM flow and arc of coverage - for the system to use in calculating a resultant Precipitation Rate (rate of applying water) by this arrangement of sprinklers.

Click on Arrow and select Precip Data Table from “drop-down” screen

Precipitation Rate automatically calculated and entered upon entry of all preceding data

Click on cell, then click on button. Select pattern from “drop-down” screen

Click on cell & enter spacing

Select Sprinkler from sprinkler table (Click on Spkr. Icon) and GPM will be entered automatically.

* See below for typical sprinkler table.

Click on OK to store data

• Typical Sprinkler Table
Defining Multiple Courses

This screen provides for ADDING, EDITING or DELETING of up to three (3) 18-hole courses total (Two (2) with Stratus II). Each course will have a separate name and separate database information. The courses may be operated independently or simultaneously.

To define another course, click on the ADD box, enter the name and click OK. Proceed from here to enter all the Start Up data for this course. **NOTE:** Each course requires its own database, thus the Start Up procedure must be re-run for each additional course.

To Delete a course, highlight the course to be deleted, click on the DELETE box, and click YES.
Defining Special Areas

This screen provides the capability of defining up to seven (7) special areas (three (3) for Stratus II), such as: Chipping Green, Clubhouse Area, Nursery, etc., that may be found on the course. These are areas, other than the standard areas as Greens, Tees, Fairways, Approaches, Perimeters, Roughs, etc. Each defined special area will have a unique “handle” that is needed to assign for identification and that will be used in programming the system.
This screen provides for the entering of various “default” data for the system, including:

**Station Run Time** - Total time, in minutes, that station is to operate in order to apply the required amount of water to the area.

**Station Cycle Time** - The maximum time allowed for the subject station to operate at one time. Time should be based on infiltration rate of the soil, slope conditions, etc., as well as the application rate of the sprinklers covering this area to prevent “runoff” and “puddling.”

**Station Soak Time** - The minimum time allowed to elapse between applications of water to the area.

**Station ET Adjust %** - The percentage “increase” or “decrease” of System ET value in order to adjust the area Micro-Climate to satisfy existing conditions of the area.

The data that is entered into this table should reflect “normal” conditions - realizing that these values may not be true for ALL stations controlling sprinklers in the area, but rather the majority of them. The various values can be refined and changed, on a per station basis, at a later date in accordance with the programming and during actual operation of the system. In doing so, these refined values will “override” the “default” values that are entered into these tables. If there are no other values for a given station, the “default” values will then be used in actual operation of the system.
Select Course
Other Areas button
Sub-Areas Button
Sub-Areas Groups

Max. ET (in.)
Import Data Button
Weather Station Number

ET Adj. % - click on cell, then click on arrow and select ET Adj. % from “drop down” screen

Golf Areas listed
Default Run Time manually entered

Comments

Soak Time - click on cell, then click on arrow and select soak time from drop-down screen
Cycle Time - click on cell, then click on arrow and select cycle time from drop down screen

**CYCLE TIME**
Click on cell and then click on arrow - select CYCLE TIME from drop down screen

**SOAK TIME**
Click on cell and then click on arrow - select SOAK TIME from drop-down screen
After entering all the data or making changes to any of the original data, the data must be imported to have it entered in all the appropriate tables of the system.

Click on the down-arrow icon on the right side of the screen.

From the drop-down screen that is displayed, select the specific areas that were changed or select “all areas.” Then click OK and information will be “imported.”

**OTHER AREAS** CLICK ON “OTHER AREAS” BUTTON.

The screen now displays the other areas previously defined and gives the same information as presented on the “Golf Areas” screen on the previous page.
This screen provides for the entering of data in regard to the sprinklers on the various areas of the course, including:

- **Rotor Type** - Select the proper rotor model and spacing pattern for the area in question.
- **Flow per Rotor** - GPM flow per rotor model selected above will be automatically entered in table.
- **Number of Rotors per Station** - Specify the average number of rotors that are normally on a station for the given area being considered.
- **Precipitation Rate** - Select proper rotor model, spacing pattern, etc. and precipitation rate will automatically be entered into the table.

The data that is entered into this table should reflect normal conditions - realizing that these values may not be true for ALL stations and sprinklers in the area, but rather the majority of them. The various values can be refined and changed, on a per station basis, at a later date in accordance with the programming and during actual operation of the system. In doing so these refined values will override the default values that are entered into these tables. If there are no other values for a given station, the default values will then be used in actual operation of the system.
From this drop-down screen, select the rotor type, nozzle size, and operating pressure.

**FLOW PER ROTOR**

Rotor Type and GPM flow per rotor will be automatically entered into the table.

**PRECIPITATION RATE**

Click on cell, then click on drop-down arrow and select the precipitation rate from drop-down screen.
After entering all the data or making changes to any of the original data, import the data in order to have it entered in all the appropriate tables of the system.

Click on the down-arrow icon on the right above the chart.

From the drop-down screen that is displayed select the specific areas which were changed or select “All Areas.” Then click OK and information will be imported.

**DEFAULT ROTOR DATA - OTHER AREAS**

The screen displays the other areas previously defined and gives the same information as presented on the “Golf Areas” screen. Data can be entered into this table in the same manner as in the preceding table for the “Golf Areas.” Be sure to import the data in order to have it entered in all of the appropriate tables of the system.

---

*This concludes the start up process for entering data. Now continue to section 2 for directions about importing or creating maps.*
Creating a Map of your Course

The Map Creation Wizard is the final part of the start up process.

In order to provide some type of interface between an Irrigation Control Program and golf course layout, a map of the course needs to be created. There are two methods that can be used to accomplish this.

1) Import a map of the course from a SHAPE, BMP or TIF type file. This can be from the Architect’s design of the course, the Consultants system design or an As-Built plan.
2) Create a “Scorecard” layout that approximates the layout of the course

The importance of the map is to provide the interface instrument that will be used to establish programs for the system, Flo-Manager data for the system operation and, provide a graphic presentation of what is operating on the course at any time.

The first step in creating the map is to give it a NAME. It must be a unique name. Click on the cell in the screen displayed and type in the Name for the map.

Proceed from this point according to the method chosen to create the map. Refer to the appropriate method described in this section.
Scorecard Map Creation Method

The following screen will be displayed.

Select the Course that is being mapped.

Select by clicking on one of the eight hole layouts presented that best represents hole #1.

After selecting a layout for hole #1, a checkmark will appear next to the #1, and hole #2 will automatically be highlighted, indicating that this is the next hole that needs a layout selection.

Hole #1 has now been checked.

Hole #2 is automatically highlighted to indicate this is the hole that needs a layout to be selected.

Click on the desired layout that best fits hole #2.

Once all hole layout selections are completed - Click on the OK button and the Scorecard will be generated.

NOTE ! - Generating the Scorecard layout can take up to 2 minutes - so be patient. When the layout has been completed the Scorecard will be automatically displayed.

COMPLETED SCORECARD LAYOUT
A map of the course may be created from a SHAPE, BMP or a TIF type file. With the selection of this method from the “Map Creation Wizard” screen, please note: this method can only be done once in Nimbus II and Stratus II; the first map will have to be removed in order to create a different map.

Click on “Define a map from existing files”, then click on “Next” to proceed

The following screen will be displayed.

Open the folder that the map is in.

Double-click on the map folder to display the map attribute files (see screen below)

This screen is for choosing the various map attributes files.

Highlight the items to be displayed on your map by clicking on the first item, hold down the shift key, and then click on the last item. This will highlight the range of items chosen

After all selections have been made, click the OPEN button to have these feature included on the map
After clicking OPEN, each feature will be posted on the this table.

These 4 buttons are used to adjust the layers as preferred by the end user. Make adjustments as desired.

Click “APPLY” when finished, then click OK and a map will be generated.

COMPLETED MAP FROM IMPORT METHOD
A map can also be created or imported through the map import section of the Office Navigator Tool Bar.

All of the system basic foundation data, such as: Map Import, System Data Builder, Flo-Manager Data, etc., can be entered from this “Map Office” section of the software. In addition, many of the daily functions are also accessible from this section such as: Program Builder, Course Monitor, etc. Click on the Office Navigator icon and the following Tool Bar will drop down. From this Tool Bar click on the Map Import icon.

**OFFICE NAVIGATOR TOOL BAR**

- **Office Navigator**
- **Return to Front Office**
- **Program Builder™**
- **Flo-Manager® Data Builder**
- **Course Data Builder™**
- **Map Import™**
- **Map Utilities**
  Available in Nimbus II and Stratus II as a Software module purchase

**NOTE!** Clicking on any of these icons will lead directly to the respective Office Screens or functions.
This Map Office TOOL BAR is available with any of the office functions.

*Information Tool* - View information on a specific item.

*Go to Hole Tool* - “Zoom” in on a specific hole.

*Delete Tool* - Delete selected object on map.

*Move Tool* - Move selected object on map.

*Extent Tool* - “Zoom” out to full view picture of map.

*Print Tool* - Print selected sections or items of map.

* = These functions are not applicable in the Map Import process.
a) Click on the “ZOOM” icon on the tool bar at the top of the Map Screen.

b) The pointer will now change to a “Magnifying” glass with a “+” symbol in it (the same as the icon on the tool bar).

c) Position the magnifying glass on the location on the map that is to be the upper left hand corner of the desired area to “zoom” in on.

d) Holding the left-mouse button down, outline the area to “Zoom In” on.

e) Upon releasing the left-mouse button, the zoomed area will be displayed.
ZOOM OUT
of a specific area
after it has been
“Zoomed In” on.

Click on “ZOOM OUT” icon

a) Click on the “ZOOM
OUT” icon on the tool bar at the top of the Map screen.

b) The “Pointer” will now change to a “Magnifying” glass with a “-“ symbol in it (the same as the icon on the tool bar).

c) Position the Magnifying glass near the center of the enlarged area of the map and click the left-mouse button.

d) The Course Map will now be restored to its original size.

ZOOMING BACK
to the previous Area or Course Map.

Click on “PREVIOUS” Area or Course Map icon

a) Click on the “Previous” Area or Course map icon.

b) The Map area of the screen will be restored to the map or Area that was just previously established or displayed.
**PAN**

*Pulling and dragging an area of the map to reposition it*

---

**Screen “PULL” icon**

---

a) Click on the Screen “PULL” icon. The Pointer will now change to the “Hand” icon.

b) Place the “Hand” pointer on the map, on the area of the map that you wish to move.

c) Using the left mouse button, hold the button down and drag the hand pointer in the direction the map should shift.

d) By “dragging” the map can be positioned in any way. Once the left-mouse button is released, the map will be repositioned onto the screen.

e) The process may be repeated as often as necessary to get the map positioned as desired.

---

**NOTE !** At any time, by clicking on the spacebar, the pointer will be re-established from the magnifying glass or the hand type cursor to the “Arrow”. Or the “Arrow” may be re-established by clicking on the “Arrow” icon on the tool bar.
**SYSTEM LAYERS FUNCTION**

*System “Layers” icon*

This function provides for the changing of the attributes of the Course Map.

a) Click on the “System Layers” icon.

b) A drop-down screen will be displayed as shown here.

c) This drop-down screen gives a number of choices of symbols, labels, and lines that can be added to a Course Map. Any of these features may be included on the map or removed from the map at any time, as may be desired for clarity of operation.

d) With none of the items “checked,” the Course map will appear with no labels, symbols, or lines shown.
e) To add symbols to the map, click on all the Symbol items in the drop-down screen.

f) Then click on the OK button to enter data on the map.

g) The Course Map will now be displayed as shown here.

h) Labels and Lines can be added to the map in a similar manner. Click on all the Label and Symbol items in the drop-down screen.

i) The Course Map will now be displayed. It shows all area labels, all station, rotor, flow zone, branch, pump symbols, and all lines associated with them.
**Right Side of the Map Import Tool Bar**

*OPEN MAP* - Opens an existing map.

*SCORECARD MAP CREATION* - Allows user to create a map with predetermined shapes for the holes, arranged in a Scorecard format.

*LAYERS TOOL* - Allows user to turn ON or OFF different “layers” or attributes of the map. Please note: To utilize this tool with the Nimbus II or Stratus II software systems a software module keycode must be purchased.

*EXPORT TOOL* - Used to save the layers information in a special file (*.cif), possibly to move to another computer.

*IMPORT TOOL* - Used to bring in the shape (*.shp) files from a previously created map, either from GPS or CAD drawing, or an aerial photo.

*CLEAN TOOL* - Clears the data layers off the map.

*CREATE MAP WIZARD* - Allows user to create a map by using any of the methods above, scorecard, import, etc. Walks the user through the necessary steps to accomplish.
Course Data Builder™

This feature is accessed by clicking on the “Course Data Builder” icon located on the Office Navigator Tool Bar.

The tool bar for the “Course Data Builder” will now be displayed.

With the creation of the course map, the next step is to identify each of the holes involved and the various areas on each hole that are to be irrigated. This process involves placing “MARKERS” or a “HANDLE” at each of the holes and individual areas of the hole, such as; Green, Tee, Fairway, Approach, Perimeter, Rough, Miscellaneous Areas, etc. This would also include other areas, such as; Chipping Green, Driving Range, Clubhouse Area, etc.

These “markers” or “handles” will be used to identify the various areas, or holes while entering other data, such as; controller stations, sprinklers, etc.
STEP 1
Hole Marker/Number

a) Click on **Hole Marker** Icon (H) at top center of screen

b) Click on the map location, to place the hole marker.

c) Enter Course Number and Hole Number in Area Properties screen.

d) Click on OK to enter marker on map at the location indicated.

e) Repeat steps (a) through (d) of this process for all holes on the course.

If you make a mistake and need to remove a Marker, click on the delete button at the top of the screen, then click on the Marker that you wish to delete. A confirmation screen will appear. Click the box next to “delete from database,” then click YES to confirm the deletion. Make changes **BEFORE** proceeding to the next step. Once you have proceeded to the next step, **DO NOT delete a marker from a previous step.**
STEP 2
Area Marker/Number

a) Click on Hole Marker H on map. The marker will become “highlighted” indicating which hole is being worked on.

b) Click on the Green Marker icon G at the top of the screen.

c) Click on the map location, to place the Green Marker.

d) Green Marker G for Green #18 will be placed on the map at the chosen location.

e) Repeat steps (a) through (d) of this process for each hole and the individual areas on the course.
STEP 3
Predefined Other Areas Marker/Number

a) Click on Other Areas button at the upper right of the screen tool bar.

b) The following tool bar will be displayed at the top of the screen. Please note: only three Other Area Handles are available in Stratus II.

All Other Area Markers

To identify the Location with a marker . . .

c) Click on one of the other area Icons on this tool bar. For example, D.

d) Click on the map location, to place the marker.
e) The following screen will be displayed.

Then click OK
To enter marker on map

f) The Driving Range marker D will be entered on the map at the chosen location. It will be further identified as course #3, hole #19.

Enter the number of the course


g) Repeat steps (c) through (e) of this process for any of the other predefined areas on the course.

Other predetermined areas such as; Chipping Green, Practice Area, Target Greens, Nursery and Under Construction Areas, may be MARKED by following the procedure given above for “Driving Range.”
STEP 4
Other Area Markers/Numbers

This feature assigns markers for other areas that have not been predefined and that may be defined manually. The tool bar at the top of the screen is as shown below.

<table>
<thead>
<tr>
<th>Area</th>
<th>Other Areas</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>D C B E N X Y</td>
</tr>
<tr>
<td>New Area Driving... Chipping... Putting... Club House... Nursery</td>
<td>Misc 1 Misc 2</td>
</tr>
</tbody>
</table>

a) Click on the “New Area” icon, located on the right side of the tool bar at the top of the map screen.

b) The following screen will be displayed.

The Area “Handles or Markers” that are available are listed here.

The predefined Area “Handles or Markers” are listed here.

c) In the drop-down screen, the maximum number of “other areas” (handles) have been added.

d) In order to add the Clubhouse area it is first necessary to remove any of the predefined areas not being used.

Remove any of the predefined areas not being used.
e) In order to remove those predefined area “handles” which are not being used, click on the letter of the area to be removed in the current area handles section. For example, for area under construction, click on the letter U.

f) The letter U is now displayed with its Handle Name. Also the “REMOVE” button has now been made active.

In addition, the “Maximum Handles Added” message has now been removed and has made room for the addition of another Area Marker.

h) In order to add a marker for a new area, click on one of the Available Area Handles. For example, to add a Clubhouse Area, you might click on the K button.
i) The following screen will be displayed.

Enter the NAME of the Area

The Area “handle” is displayed here

Click the “ADD” button to add the new marker to the current area list handles

j) The screen now includes the Clubhouse Area marker K with the other “Current Area Handles.”

“Maximum Handles Added” message has reappeared.

Clubhouse Area marker K has been added to Current Area Handles

k) The Clubhouse Area Handle K has also been added to the tool bar at the top of the map screen.

l) To add the marker for the Clubhouse Area to the map, first Click on the Clubhouse Area icon K on the tool bar at the top of the screen.
m) Then click at the location on the map where the marker is to be located.

n) Enter the Course Number and then Click the OK button.

m) The Clubhouse Marker K has now been placed on the map at the location selected. It will identify the Course # and Hole #, but you may edit the label by RIGHT-clicking on the K and typing in a new name.

NOTE! Keep in mind, that the system is limited to a maximum of seven (7) such areas, in addition to the standard areas, such as: Greens, Tees, Fairways, Approaches, Perimeters, Roughs and Misc. Areas.
Station Assignments

Please note: This feature is available in Nimbus II and Stratus II with the purchase of a keycode software module. It is included with the Cirrus software program.

This feature provides for the assigning of controller stations for the operation and control of sprinklers in the various areas of a given hole. For each of the areas on a given hole that are to be irrigated, designate and mark on the map each station that will be controlling sprinklers on the area.

a) To get the “Tool Bar” displayed for the “Station Assignments,” click on the “STATIONS” button at the upper right of the screen at the top of the map screen.

   Click on “STATIONS” button

b) “Stations” Tool Bar will now be displayed.

c) This tool bar shows the stations that may be assigned to any one of five (5) different groups, such as; A, B, C, D and E. This provides for the programming by groups in which only those stations assigned to the particular group participate in the actual irrigation cycle.
Assigning Stations to Group A

a) Click on the desired Group Letter icon on the Tool Bar.
Example: We wish to assign a station to Group A.

b) Click on Area Marker (Handle), for the Area to work on. Example: G for the Green on hole #2.
The G will change color to blue, indicating that any stations now entered will be for the Green at hole #2.

Example: Click on the Area Marker to highlight it – indicating the area to be worked on.

Click on location on map where first sprinkler of this station is located. Sprinkler/Station marker will be placed on the map, as shown

Line between Sprinkler/Station symbol and Area marker ties this station to Green #2.

c) Click the location on the map, where the first sprinkler for the station is located.
A marker, such as 1A (indicating station #1 in the A Group), will be entered on the map at the location chosen.

Click on location on map where first sprinkler of this station is located. Sprinkler/Station marker will be placed on the map, as shown
d) Move the cursor to another location on the map, where a sprinkler for another A station is located and double-click the left mouse button. A Station marker and station number will be entered on the map.

Click the location on the map where second sprinkler of this station is located. Sprinkler/Station marker will be placed on the map, as shown.

Line between Sprinkler/Station symbol and Area marker ties this station to Green #2

e) Continue for any other A group stations for this green.

f) The same procedure can be used for other “groups” (i.e. B, C, D & E), other areas on this hole (Tee, Fairway, Approach, Perimeter, & Rough), and for areas on other holes.

If you make a mistake and need to move a Station Marker to another location, click on the move button at the top of the screen, then click on the Marker that you wish to move and drag it to its new location.
Adding Sprinklers to Defined Stations

This feature adds other sprinklers that are being controlled by a given station to already defined Sprinkler/Stations.

a) Click on the Sprinkler icon on the tool bar, at the top of the map screen.

b) Click on the Sprinkler/Station marker to which the sprinkler is to be added. The color of the Sprinkler/Station symbol will change from WHITE to BLUE, indicating the station that is to control this sprinkler.

   Click on the Sprinkler/Station to add a sprinkler. The color will change from WHITE to BLUE.

c) Click on the location on the map, where this sprinkler being controlled by this station is located.

   Click on location where sprinkler is located

   Line between Sprinkler/Station symbol and sprinkler symbol is added – ties the sprinkler to the indicated station.
d) The sprinkler symbol is added to the map at the location indicated and is further designated with a 2 – indicating it is the second sprinkler on this station.

Sprinkler symbol and number 2, indicating it is the second sprinkler on this station, will be entered on map.

e) Additional sprinklers, being controlled by other already defined stations, may be entered on the map in a similar manner.

Click on location where another sprinkler is located. Click on Sprinkler/Station to which an additional sprinkler is to be added.

NOTE! Continue to add additional sprinklers, being controlled by a given station, to any Sprinkler/Stations already defined and marked on the map. The procedure would be as described in the preceding steps (a) through (d).
This feature provides for the enhancement of various aspects of the map. Choices to be displayed on the map include, “none”, “any” or “all” of the following features:

Please note: In the Nimbus II and Stratus II software programs the symbols for Area and Labels for Area Handles are the layers to manipulate as the default. Purchasing the software module for map layer/station resolution will activate all of the layers.

- Symbols for Station
- Labels for Stations
- Lines for Stations
- Symbols for Area Handles
- Labels for Area Handles
- Symbols for Rotors
- Labels for Rotors
- Lines for Rotors
- Symbols for Pumps, Branches, etc.
- Labels for pumps, Branches, etc.
- Lines for Pumps, Branches, etc.
- Symbols for FloZones
- Labels for FloZones
- Lines for FloZones

Once you have made your selections and are satisfied with those chosen to be displayed on your map – then Click “OK” to enter

These can be changed at any time. By “suppressing” the feature does NOT permanently remove the feature and it can be restored at any time desired.
Please note: This feature is ONLY available in the Cirrus Central Software. For Nimbus II and Stratus II software systems, Flo-Manager is only accessible through the Front Office Toolbar – group 3. Please refer to the end of this section for further instructions.

This feature establishes FLOW data that the system can utilize to properly distribute the flow demand over the piping network, and thus prevent “hydraulic over-loading” of the system. In addition, it will keep the system demand as near the maximum system capacity as possible, thus resulting in the most efficient system operation and conservation of energy and water.

In Cirrus Central Software, this feature is accessed by clicking on the “Flo-Manager Data Builder” icon located on the left side of the Office Navigator Tool Bar.

a) To display this Tool Bar, click on the Map Office icon.

b) Click on the “Flo-Manager Data Builder” icon.

c) The Tool Bar for the “Flo-Manager Data Builder” will be displayed as shown below.
**Adding a Pumping Station**

This feature locates a Pumping Station on the map and enters the flow characteristics of the pumping station.

a) Click on the Pump icon at the top of the map screen.

b) Click on the map, where the Pumping Station is to be placed.

c) Enter Pumping Station operating characteristics.

**Example:**

A pumping station consisting of four (4) individual pumps will be pressure controlled as the flow demand increases or decreases. The smaller (Jockey) pump will be brought “IN” and “OUT” of operation as the demand increases and each new pump is placed into operation.

<table>
<thead>
<tr>
<th>PUMP #1</th>
<th>PUMP #2</th>
<th>PUMP #3</th>
<th>PUMP #4</th>
<th>TOTAL CAPACITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>25 HP</td>
<td>30 HP</td>
<td>50 HP</td>
<td>50 HP</td>
<td>250 GPM</td>
</tr>
<tr>
<td>250 GPM</td>
<td>300 GPM</td>
<td>500 GPM</td>
<td>500 GPM</td>
<td></td>
</tr>
</tbody>
</table>

| X         | --        | --        | --        | 250 GPM        |
| --        | X         | --        | --        | 300 GPM        |
| X         | X         | --        | --        | 550 GPM        |
| --        | X         | X         | --        | 800 GPM        |
| X         | X         | X         | --        | 1050 GPM       |
| --        | X         | X         | X         | 1300 GPM       |
| X         | X         | X         | X         | 1550 GPM       |

(X = Pump in Operation  -- = Pump NOT Operating)

The Jockey pump is used to maintain pressure on the system at all times, whether there is irrigation taking place or not. The Pumping Station is controlled on “pressure demand”, that is, as the demand of the system increases, the pressure in the system will fall and the controls will sense it and take the jockey pump out of operation and start the #2 pump. If the demand further exceeds that pump capacity, the controls will start the jockey pump and the two pumps will now attempt to supply the demand. The dropping “IN” and “OUT” of the jockey pump and starting one of the additional pumps will take place automatically, according to the operation chart above, in order to meet the demand of the system.
d) After clicking on the map where the pumping station is to be located, the following drop down screen will be displayed. This screen needs to be filled in with the pumping station operating characteristics. Click OK when finished.

![Pump Station Properties Screen]

NOTE ! Refer to the Pump Station Operating Table, given on the preceding page, for the “Capacity Levels” for the PUMP PROPERTIES Table above. It is recommended that you make a similar chart for the pumping station to make filling in data easier.

![NOTE Image]

e) The Pump Station Marker will now appear on the map at the location indicated.

![Pump Marker Image]

f) The PUMP STATION will automatically be entered in the “Flo-Manager” chart located on the left side of the map screen.

If you make a mistake and need to remove a Marker, click on the delete button at the top of the screen, then click on the Marker that you wish to delete. A confirmation screen will appear. Click the box next to “delete from database,” then click YES to confirm the deletion. Make changes BEFORE proceeding to the next step. Once you have proceeded to the next step, **DO NOT DELETE a marker from a previous step.** You may also use the MOVE icon to drag a marker to a new location.
Adding Branches to the Piping Network

After the pump station operating data has been entered and the pump station marker has been located on the map, the next step is to lay out the piping network of the system. This piping network will be broken down into Branches (Main Lines) and Flo-Zones (Lateral Piping to sprinklers).

**Flo-Manager Tool Bar**

a) Click on the Branch icon, located on the Tool Bar, at the top of the map screen.

b) Click on the Pump Marker located on the map, if this branch is being directly supplied from the pump. If not, click on the Branch Marker of the branch that will be supplying it. In either case, the marker will be highlighted, changing color from red to blue, and indicating the source of supply for the Branch being added.

c) Position cursor on map location, where end of Branch is desired to be located.

d) Click on this location and the following drop-down screen will be displayed. Enter the data asked for and click OK.
e) Click OK and the Branch marker will appear on the map at the location indicated. In addition, the Branch “SOURCE” and Branch “NUMBER” will be noted.

Designation is for ~
“P4” = Source is Pump Station #1
“B2” = Branch Number

Branch Marker has been entered on map

Line indicates the Branch
Source is Pump Station #4

f) This Branch will automatically be entered in the Flo-Manager chart on the left side of the screen. It shows its source is Pump Station “P4”, the branch NUMBER, NAME of the branch, and Max. Capacity.

Station

Branch marker has been added to map

h) Each new branch will automatically be added to the Flo-Manager chart providing a complete Tree of all the Branches that have been entered.
Displaying Branch Table

The “Branch Table” may be displayed by clicking on the “Map Office” icon, then clicking on the Flo-Manager Data Builder icon.

a) Using the RIGHT mouse button, click on the “P1” Pump Station in the Flo-Manager Tree, which is located on the left side of the Map Office screen.

b) A drop-down screen will now be displayed, as shown here.

c) Click on “Branch Table.”

d) The “Branch Table” will now be displayed, as shown here.
Reviewing Branch Properties

Any given Branch may be reviewed by displaying the “Branch Properties” screen. Click on “Map Office,” then Flo-Manager icon.

a) Using the RIGHT mouse button, click on the “Branch”, in the Flo-Manager Tree, to be reviewed.

b) A drop-down screen will now be displayed.

c) Click on “Properties.”

d) The Branch “Properties” table will be displayed.

Branch Source of Supply – “P1” Pump Station and directly by “B1” Branch, which is a Max. Capacity of 1800 GPM

<table>
<thead>
<tr>
<th>Branch Number</th>
<th>Branch Name</th>
<th>Branch Source of Supply</th>
<th>Max. Branch Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>8” Line</td>
<td>P1</td>
<td>750 GPM</td>
</tr>
</tbody>
</table>
Adding Flo-Zones to the Piping Network

With the Pump Station marker, operating data, and Branch piping markers entered and their maximum capacity specified, the next step is to establish Flo-Zones and specify a maximum capacity for each.

a) Click on the Flo-Zone icon, located on the tool bar, at the top of the map screen.

b) Click on the Branch Marker (“handle”) of the branch that will be supplying the Flo-Zone. Marker color will change from light blue to dark blue indicating this is the branch that will be supplying the Flo-Zone.

c) Next click on the map location for the Flo-Zone marker to be placed.

Click on the map location, to place the Flo-Zone marker
d) The following drop-down screen will be displayed. Enter the required data for the Flo-Zone.

Flo-Zone Number & Source are automatically entered

Enter the Maximum Capacity for this Flo-Zone

Enter a NAME for the Flo-Zone

When all data has been entered, click on OK to save data

e) Once OK is clicked, the Flo-Zone marker shall be entered on the map at the location indicated. It is further identified by “P1” for being supplied by Pump Station #1, “B13” for Branch #13 and FZ8 for Flo-Zone #8.

Flo-Zone marker has been entered on map

f) In addition, the Flo-Zone will be automatically entered in the Flo-Manager chart – showing that branch B13 is its source of supply, giving the Flo-Zone Number, Name and maximum capacity.

Flo-Zone is automatically entered in Flo-Manager chart – located on the left side of the map screen
Displaying Flo-Zone Table

The “Flo-Zone Table” may be displayed by clicking on “Map Office,” then clicking on Flo-Manager icon.

a) Using the RIGHT mouse button, click on the “P1” Pump Station in the Flo-Manager Tree, which is located on the left side of the screen.

b) A drop-down screen will now be displayed.

c) Click on “Flo-Zone Table.”

d) The “Flo-Zone Table” will now be displayed.
Any given Flo-Zone may be reviewed by displaying the “Flo-Zone Properties” screen. This can be done from the “Map Office” screen.

a) RIGHT-click the mouse button on the “Flo-Zone” you wish to review.

b) A drop-down screen will now be displayed.

c) Click on “Properties.”

d) The “Flo-Zone Properties” table will now be displayed.

Flo-Zone Source of Supply – “B6” Branch, which is 8” size and has Max. Capacity of 1050 GPM

Maximum Flo-Zone Capacity
Assigning Stations to a Flo-Zone

With the assignment of Flo-Zones completed, assign the various stations to one of the Flo-Zones. There are THREE (3) methods used to assign stations.

1) Assign EACH station individually to the Flo-Zone.

2) Assign ALL stations of a given AREA to the Flo-Zone, at one time by making one single entry.

3) Assign ALL stations of a given HOLE to the Flo-Zone, at one time by making one single entry.

a) Click on the “Assign S” icon, located on the Tool Bar, at the top of the map screen.

b) Click on the Flo-Zone marker, for the Flo-Zone to which stations should be assigned.
Assigning Stations by Individual Station

c) Click on the Flo-Zone Marker.

d) Click on all Station Markers to be assigned to that Flo-Zone.

Assigning Stations by Area

c) Click on the Flo-Zone Marker.

d) Click on the Area Marker to assign ALL stations of this area to the selected Flo-Zone.

---

*Selected Flo-Zone marker “highlighted”*
Assigning Stations by Hole

c) Click on the Flo-Zone marker.

d) Click on the Hole Marker to assign ALL stations of this hole to the selected Flo-Zone.

e) All stations will graphically show which Flo-Zone they have been assigned to and all stations will automatically be entered into the Flo-Manager TREE, located on the left side of the map screen.

f) All Stations on the course can be assigned to a specific Flo-Zone in a similar manner, by repeating steps (a) through (d) listed above.
Any given “Station” may be reviewed by displaying the “Station Properties” screens. Click on “Map Office,” then click on the Flo-Manager icon.

a) To review a station, RIGHT-click the mouse button on the particular station listed in the Flo-Manager Tree.

b) A drop-down screen will be displayed.
Review Device Data of Station

c) Click on “Device Data” in the drop-down screen.

d) The “Address Data” screen for the selected station will be displayed. The following is an example of this screen for a Decoder System.

To review Run Time data, Rotor data, Flo-Manager data, and/or Precip data, click on the icon on the left side of the screen.

e) To review other stations, repeat steps (a) through (d).
After completing the Course Data Builder and the Flo-Manager Data Builder, the map will appear similar to the portion of map displayed below.
For Nimbus II and Stratus II users the Flo-Manager data is input without the use of the map.

Click on the Flo-Manager icon to start.

The following screen will appear: RIGHT-click on the words Flo-Manager.

Click on Add a Pump from this drop-down menu.

The following screen will appear:

Enter Pumping Station operating characteristics. Click Apply, then OK when finished.
Example: A pumping station consisting of four (4) individual pumps will be pressure controlled as the flow demand increases or decreases. The smaller (Jockey) pump will be brought “IN” and “OUT” of operation as the demand increases and each new pump is placed into operation.

<table>
<thead>
<tr>
<th>PUMP #1</th>
<th>PUMP #2</th>
<th>PUMP #3</th>
<th>PUMP #4</th>
<th>TOTAL CAPACITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>25 HP</td>
<td>30 HP</td>
<td>50 HP</td>
<td>50 HP</td>
<td></td>
</tr>
<tr>
<td>250 GPM</td>
<td>300 GPM</td>
<td>500 GPM</td>
<td>500 GPM</td>
<td></td>
</tr>
<tr>
<td>X</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>250 GPM</td>
</tr>
<tr>
<td>--</td>
<td>X</td>
<td>--</td>
<td>--</td>
<td>300 GPM</td>
</tr>
<tr>
<td>X</td>
<td>X</td>
<td>--</td>
<td>--</td>
<td>550 GPM</td>
</tr>
<tr>
<td>--</td>
<td>X</td>
<td>X</td>
<td>--</td>
<td>800 GPM</td>
</tr>
<tr>
<td>X</td>
<td>X</td>
<td>X</td>
<td>--</td>
<td>1050 GPM</td>
</tr>
<tr>
<td>--</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>1300 GPM</td>
</tr>
<tr>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>1550 GPM</td>
</tr>
</tbody>
</table>

(X = Pump in Operation   -- = Pump NOT Operating)

The Jockey pump is used to maintain pressure on the system at all times, whether there is irrigation taking place or not. The Pumping Station is controlled on “pressure demand”, that is, as the demand of the system increases, the pressure in the system will fall and the controls will sense it and take the jockey pump out of operation and start the #2 pump. If the demand further exceeds that pump capacity, the controls will start the jockey pump and the two pumps will now attempt to supply the demand. The dropping “IN” and “OUT” of the jockey pump and starting one of the additional pumps will take place automatically, according to the operation chart above, in order to meet the demand of the system.

The Pump Station will be automatically entered in the Flo-Manager chart.
Adding Branches

Once the pump station properties have been established, the Branch Table information needs to be filled in.

1. Click on P1 to highlight it, then RIGHT-click on P1.

2. Click on “Add a Branch” in the drop-down menu. The Branch Table screen will be displayed.

3. Fill in the Branch properties and click Apply, then OK.

Repeat these steps for each individual branch associated with Pump Station #1. Repeat for each Pump Station until all Branches have been added.

The “Branch Table” may be displayed for review or editing, by clicking on the Flo-Manager icon in Map Office Group 3 ToolBar, then RIGHT-clicking on Flo-Manager and selecting Branch Table from the drop-down screen.

If changes need to be made, edit within the Branch Table. Click on Apply and then OK. To further review branch properties, refer to page 67.
Adding Flo-Zones

Once the branch properties have been established, the Flo-Zones need to be created.

1. Highlight a branch and RIGHT-click on it.

2. Click on “Add a Flo-Zone” in the drop-down menu. The Flo-Zone Properties screen will be displayed.

3. Fill in the Name and Capacity for that Flo-Zone. The Flo-Zone number and Source will automatically be displayed.

4. Click Apply and then OK to record the data.

Repeat this step for each individual Flo-Zone associated with the branch you have selected. Each Flo-Zone will be automatically entered in the Flo-Manager tree.

To display the Flo-Zone Table for review or editing, RIGHT-click on Flo-Manager at the top of the tree. Click on Flo-Zone Table in the drop-down menu and the table will be displayed.

To review Flo-Zone properties, refer to p. 71.
Assigning Stations to a Flo-Zone

1. Click to highlight the Flo-Zone to add stations to.
2. RIGHT-click to display the drop-down screen.
3. Click on Assign Stations.

The Flo-Zone Assignment Screen will be displayed. Enter Station information and click OK.

Repeat for all Flo-Zones.

To review Station Properties, refer to pp. 75-76.
This feature provides all pertinent data entered in relation to each specific area of a particular hole. The data is displayed for each hole, one hole at a time. All data for all satellites or decoders pertaining to this hole are given.

This feature is accessed by clicking on the “Station Detail” icon, located on the right side of the “Map Office” screen.

![Station Detail™ Table]

Click on the “Station Detail” icon.

The “Station Detail” table will be displayed as shown below.

![Station Detail Table]

Select areas for observation

Course #
Hole #

Add/Delete

Satellite Definition

Select properties for observation

System Data Tables, Area Definition Tables, Default Data Settings
The various properties that are given for each area are as follows:

1a) **Controller Data/ Rotor Address** (Satellite System)

**Group Number** that satellite is assigned.

**Satellite Number** - channel number to which satellite will respond.

**Station Number** – the number of the station that is controlling the sprinklers in this area.

**Number of Solenoids** being energized by this station.

**Course View display:**

- **Channel Number to which Station will respond**
- **Number of solenoids being energized by Sta.**
- **Select an Area to display**
- **Click here to toggle between the Course View and the Satellite View**

**Satellite Properties for observation**

**Satellite Group**

**Station Number**

**Valve Number and Location**

**Course Number**

**Hole Number**

**Satellite View display:**

- **Show all satellites**
- **Satellite Group Selection**
- **Satellite Channel Selection**
- **Hole**
- **Irrigation Type**
- **Station**
- **No. of Solenoids**
1b) **Decoder Data**

(Decoder system)

- **Decoder Address** - code by which decoder will respond.
- **Decoder Type** – Single Pack or Six (6) Pack
- **Decoder Switch Type** – normally #1 (59FA50)
- **Number of Solenoids** being energized by this decoder.

Select Area to be displayed.

- **Course Number**
- **Hole Number**
- **Select Property for observation**

- **Valve Number and Location**
- **Code to which decoder will respond**
- **Decoder Type** (Single or 6-pack)
- **Decoder Switch Code** (normally#1)
- **Number of solenoids being energized by Decoder**
2) **Run Time Data**

- **Station Run Time** – the time specified, initially this will be the default time entered in the “start up” process.
- **ET Adjust Factor** – the percentage adjustment to be made to the “system ET Value”.
- **Station Adjust Factor** – a further percentage adjustment to be made to this station’s “run time.”
- **Cycle Time** – the maximum time for the water to be applied to this area on any given application.
- **Soak Time** – the minimum time to elapse between applications of water on this area.
3) **Sprinkler/Rotor Data**

- **Station Flow GPM** – the total flow demand of the sprinklers when this station is in operation.
- **Rotor Type** – the Model Number and Type of rotors associated with this station.
- **Nozzle Information** – Size, Color, etc.
- **Pressure** – the pressure (PSI) that is required at the base of the sprinkler for proper operation.
- **Rotor Flow GPM** – the discharge flow (GPM) of the sprinkler at the operating pressure specified.
- **Number of Rotors** – being controlled by this station.

![Station Detail](image)

- **Course Number**
- **Hole Number**
- **Select Properties for observation**
- **Valve Number & Location**

**Flo (GPM) for Station**

- **Rotor Model**
- **GPM Flow of each Rotor**
- **Number of Rotors on this valve**
4) Flo-Manager Data

Flo-Zone Number – the Flo-Zone supplying the sprinklers which are controlled by this station.

Flo-Zone Capacity GPM – the maximum flow allowable in this Flo-Zone at any time.

Source Branch – the Branch Number of the branch that is

Branch Capacity GPM – the maximum flow that is available and/or allowable from this branch.

Source/Pump Station – the pump station that is the source of supply for this Branch, Flo-Zone and Station sprinklers.

Capacity – the total capacity (GPM) that the pump station is capable of delivering.
Initially the data in this table is the default data or other data entered in the process of describing and programming this system. Any of this data may be changed, as may be required, to better meet actual conditions that may exist in the field for any particular station. Changes may be made at any time in the Station Detail Table.

5) **Precipitation Data**

- **Precipitation Rate** – the rate, in inches per hour, at which water is being applied to the area by the sprinklers.
- **Sprinkler Spacing Pattern** – triangular, square, etc.
- **Sprinkler Spacing in feet** – the distance between sprinklers.
- **Sprinkler Row Spacing in feet** – the distance between rows of sprinklers.
- **Sprinkler Arc/Pattern** – full circle, part circle, etc.

Click on arrow to access drop-down table. This table contains information entered into the precipitation data table during system start-up procedure. This includes the Sprinkler Spacing Pattern, Head Spacing, Row Spacing, Arc, and Flow per Head. The Precipitation in inches/hr. will be automatically entered in the cell to the right of this column after a selection has been made.
This feature provides for programming various irrigation cycles which may be desired for operation of the system. A program is an overall irrigation plan.

This feature is accessed by clicking on the “Program Builder” icon located on the Office Navigator Tool Bar. It can also be accessed through the Front Office by clicking on the Program Detail icon under Bar 1 (see page 100).

a) Click on the “Program Builder” icon.

The Tool Bar for the “Program Builder” will be displayed as shown below.

b) Click on the “Add Program” icon.

c) The following screen will then be displayed.

Type the NAME of the Program

Next available Program Number is automatically displayed

“Default” is for a “Standard” type Program

When all data is entered, click OK

Other method of writing a Program is to use the “QuickIRR” method
The “QuickIRR™” method of programming provides for the “quick” programming of specific areas of a hole, such as: fairway, green, tee, etc., or entire holes, using the “default” data for station “run time,” “ET Adj.,” “Station Adj.,” “Cycle Time,” “Soak Time,” etc. This method requires you to specify the AREA or hole to be irrigated, the DAYS on which the program is to operate, and the TIME of day the “STARTS” should occur.

**As an Example:** To Program the Irrigation of the Fairways, for both the front and back nine holes, using the “QuickIRR” method.

a) Click on the “Add Program” icon.

b) The following screen will be displayed.

c) Enter the NAME of this program.

d) Next available Program Number will be automatically displayed.

e) Click on the method to be used to program.

f) When all data has been entered, click OK to save.

g) The program will be automatically entered in the Program Tree on the left side of the Map Screen.

h) The QuickIRR Programming Screen will also be displayed.

i) The Course No. is automatically displayed.

j) Click on the various holes to be included in this program.

k) Enter the sequence of operation # for each area to be included.

l) An X for “Run Time” indicates the default run time will be used.

m) Click OK when all data has been entered.
n) Upon clicking OK, the system will generate a “Schedule” for the hole indicated to be included in the Program. These schedules will be automatically entered into the Program Tree on the left of the screen.

o) In addition, each Hole that has been included in this Program is indicated on the Course Map, by means of a “Blue” circle at the hole. Refer to screen below.

p) It is necessary to set several other factors of this program. Click with the right mouse button on the “Program” in the Program Tree.
This screen will be displayed.

q) Click on “Properties,” using the left mouse button, and the screen will be displayed as shown below.

r) The Name & Number of the Program are shown.

s) The default values are: program is in the “AUTO” mode. Thus it will respond to all automatic starts programmed for it. Can be changed.

program is “Optimized.” Operation will be in the most efficient manner as determined by the software program.

program is NOT sensitized to ET. “Run Times” will be the “default” run times or those specified. Can be changed.

program Waterbudget is 100%. Can be changed.

program is scheduled to operate every DAY of the week. Can eliminate any DAYS desired.

“Start” time and “Stop” time need to be entered. This establishes a “Time Window” in which the schedules are allowed to operate.
Standard Program

Standard programs are “custom” programs that can be developed for specific irrigation requirements on the course. Specifying the program to be “ET” sensitized for automatic daily adjustment of each station’s “run time” can be done, as well as specifying the DAYS on which the program is to operate and the TIME of day the program is to “Start.”

As an Example: To Program the Irrigation of the Greens, for both the front and back nine holes, using the “Standard” method of programming.

a) Enter a NAME for this program

b) Next available program number is automatically displayed.

c) The “default” is for a “standard” method of programming.

d) When all data is entered, click OK to save.

e) Once OK is clicked, the program will be automatically entered in the Program Tree on the left side of the Map Screen.

f) Follow steps Q, R and S under the Quick IRR Program Builder to complete the Program specifications (see page 94).

g) Refer to page 98 to complete the individual schedules for the standard program.
This feature adds schedules to any specific programs created, using the “Standard” method of programming. Using the “QuickIRR” method of programming, the Schedules are automatically generated. Schedules are smaller irrigation plans that are included within a given program. For example, in a fairway program, a separate schedule can be made for the “front” nine holes and another schedule for the “back” nine holes. Division of the program can be even further, by building a schedule for each hole of the course, which is what the program(s) automatically does under the “QuickIRR” method of programming. This approach provides the maximum flexibility. For example, with a schedule for each hole or each area, the Waterbudget factor can be adjusted for a specific hole or area, to match the precise requirements of the hole or area. This can be particularly important for Greens, Tees, Approaches, etc.

In programming a Schedule, specify the following features for it:

- **Schedule Name** - any descriptive name
- **Schedule Number**
- **Automatic or Manual operation**
- **Waterbudget Factor** - 0% to 999% in 1% increments
- **Multi-Station** - the number of stations to allow to operate simultaneously
- **The DAYS the schedule is to operate (7 day calendar)**
- **The “START TIME” on these scheduled days** - up to 12 start times possible
- **Areas to be included in this schedule**
- **Sequence in which areas are to operate**
- **Station Run Time** - initially takes “default” run times but can be changed

### QuickIRR™ Program Schedule

Look at one of the schedules that were automatically generated in our “QuickIRR” program - #1 – MainIrrig.

1. With the left mouse button, click on the #1 Program in the Program Tree to get a listing of the schedules associated with this Program.
b) These schedules were automatically generated by the software, since the program was written using the “QuickIRR” method of programming. Using the right mouse button, click on Schedule No. 1.

c) A drop-down screen will be displayed as shown here. Using the left mouse button, click on “Properties” and a screen will be displayed as shown below.

Mode of operation – “default”=AUTO

Multi-Station operation
“default” = 10 Can enter 0 to 99

Waterbudget factor
“default” = 100% Can be changed to anything from 0% to 999%

Days of the week to operate. Click on day to eliminate or “add” to schedule

Schedule “Start” times need to be entered. Up to 12 start times possible

Station Number and Location, displayed in numerical sequence

Station “Run Time” “default” value entered. Can be changed as desired
Looking at our Example: Program #5 is for irrigation of the Greens, for both the front and back nine holes, using the “Standard” method of programming.

a) Click on Program #5, on the Program Tree, to highlight it.

b) Then click on the “Add Sch…” icon on the Tool Bar at the top of the screen.

OR

a) Using the right mouse button, click on Program #5 on the Program Tree. A drop-down screen will be displayed.

b) Then click on “Add Schedule,” using the left mouse button.

Using either of the above methods – the following screen will then be displayed.

Enter the Name of this schedule.

Next available schedule number is displayed

“Default” for schedule Type is “By Area”

Other Type of schedule is “By Station”

Once data is entered, click OK to save

c) Enter the NAME of this Schedule (Use Greens#7 for Name).

d) Next available Schedule Number is automatically displayed.

e) Select the “Type” of Schedule (In this case we will use the “default” of a Schedule by “AREA”).

f) When data is entered, click OK to save.
The Schedule will be automatically added to the Program Tree, located on the left side of the Map Screen.

Click Schedule 7 (Greens #7 is in the Program Tree), using the RIGHT mouse button, and this drop-down screen will appear.

Now click on “Properties,” using the LEFT mouse button, and the following screen is displayed.

Sequence in which stations are to operate, Course # stations are on, individual station identification and individual station run times, are not displayed and all need to be entered. This information can be added by using the add, insert, and delete keys where required.

NOTE ! Other “Programs” and their associated “Schedules”, that may be required for the course may be generated in a similar manner, as has been described above.
The “PROGRAMS” can also be generated for the course in the following manner:

a) From the tool bar on the “Front Office” screen of the program,

![Tool bar on the “Front Office” screen](image)

b) Click on the “Program” icon.

c) The following screen will be displayed.

![Operational settings button](image)

Click on the Operational settings button to choose the individual watering plan per program (i.e. vertical or horizontal operation)

![Program Schedule Details](image)

Use the “play” and the “stop” keys to start or stop a program/schedule

Use the “+” and the “x” keys to add or delete a program/schedule

After adding a program, click here to bring up the QuickIRR program method. This will display the QuickIRR programming screen (see p.92)

The “Programs” and their Properties are listed here

To View Schedules, select a program then click on the button, at the top, left-hand side of this screen.

The following screen will be displayed.
To view another schedule, click on the button at the top of the screen and select another program. Then click on the schedule button again.

To view area/station sequence for the selected schedule, click on the button and the following screen will be displayed.
TO “START” OR “STOP” A PROGRAM OR SCHEDULE

It will be noted from the screen above that the “Programs” may be manually “STARTED” and “STOPPED” from this screen by using the “Start” and “Stop” buttons.

a) First select the Program/Schedule by clicking on the NAME to highlight it.

b) Then click on the “Start” button.

c) To “STOP” a Program/Schedule, first highlight it by clicking on the NAME.

d) Then click on the “Stop” button.

NOTE! To graphically observe the operation in the field – go to the “Map Screen” and each of the Stations operating will be displayed on the map.
SECTION 6

System Operation
Course Monitor™/Manual Operation

This feature provides for the manual operation or the monitoring of any programs or schedules found in the system.

a) The “Course Monitor/Manual Operation” can be accessed by clicking on the icon located in the “Front Office” screen.

b) The “Map Office” screen will now be displayed with the Program Tree being shown on the left side of the screen and the Course Map shown on the right side of the screen.

c) To manually operate a program, select the program from the Program Tree by clicking on the program to highlight it.

Example: Select Program #1 Greens to irrigate

d) Once the program is highlighted, note that on the Course Map the area for each hole is indicated by a blue circle.
e) Next, click the “Start” icon on the tool bar at the top-right of the screen.

f) The various holes that can be operated are highlighted in red on the Program Tree.

Individual Holes that can operate at one time (as selected by the program) are now shown in RED letters.

h) Observe the individual valves that are in operation on a given hole by “zooming in” to a particular area.

Expanding Red circles indicate the individual valves that are operating

i) Expanding circles will change to the color blue to indicate that the valve is in the “Wait” or “Soak” mode. Operation will resume once the “Soak” is satisfied.

Expanding Blue circles
Expanding Red circles

Expanding Red circles - “Feedback”

Expanding Yellow circles - “No Feedback”

g) On the Course Map, the individual holes will be indicated by an expanding yellow circle (indicating “No Feedback.”) As “feedback” is received, the expanding circles will change to red.
Individual Hole - Manual Operation

c) To manually operate a given Hole Schedule, select the hole from the Program Tree by clicking on the Hole Schedule to highlight it.

Schedule #7 – for Hole #7 - Greens Program has been highlighted

d) Next, click on the “Start” icon on the tool bar at the top right of the screen.

e) On the Course Map, the valves on Hole #7 Greens will indicate operation – first with expanding yellow circles and then changing to red circles as “feedback” occurs.

Expanding Red circles indicate operation of these valves

Individual Valve – Manual Operation

c) To manually operate valves, click on the Hole Schedule of the hole from the Program Tree on the Map Screen.

d) Then click on the valve to be manually operated on the Course Map.

EXAMPLE: We wish to operate Valve #1 on Greens #7
e) A drop-down screen will be displayed.

![Monitor / Log screen](image)

*Operation TIME will be displayed here. R equals station run time

*Time station has operated will be displayed here

*Enter the TIME for this Station to operate, “up” & “down” buttons.

*Click on the “√” mark button to enter time selected

*When all of the data is correct, click OK to start station operation

f) The valve (Valve #1, on the Greens at Hole #7, of Course #1) will now be in operation.

*Expanding Red circle indicates valve is in operation
a) From the tool bar on the “Front Office” screen, a Program may be started manually from the “Program/Schedule Detail” screen.

b) Click on the “Program” icon located on the tool bar at the top of the “Front Office” screen.

c) The “Program Detail” screen will be displayed.

d) To start a program, click to highlight it. For a specific schedule, click on the schedule button at the top-left of this screen, then highlight the schedule.

e) Click the “Start” button to actually “start” the program.

f) The “Flow Bar” on the “Front Office” screen will register that the program/schedule has started.
g) Flow conditions can be monitored by clicking on the “System Capacity” button.

h) The Flow Screen will be displayed as shown here.

---

Start an Individual Valve from the “Monitor Log/DMA” screen
(“DMA” = Direct Manual Access)

This feature may be accessed from the tool bar on the “Front Office” screen.

a) Click the “Monitor Log” icon on the Tool Bar at the top of the “Front Office” screen.

   ![Click on arrow to get drop-down screen Menu]

b) The “Monitor/Log and Course Data Views” screen will be displayed.

   ![Click on arrow to get drop-down screen Menu]

c) Click on “Course Monitor/DMA to select it.
d) The “Monitor/DMA” screen will now be displayed.

e) Click on the cell of the Station.

f) Enter the time this station will operate by using the “up” and “down” arrows.

This button allows the user to write simple DMA events for irrigation by bringing up the Simple IRR control screen.

g) Once the time desired is entered, click on “√” button to enter it into the Sta. cell and start the station.

h) Time has been entered into the Station cell and the station is now in operation.

If cell is Yellow it indicates NO “Feedback”
If cell is Red it indicates “Feedback” & Operation
If cell is Blue it indicates it is in the “Soak” mode.

i) Other stations may be started in a similar manner.
At the top center of the “Front Office” screen and on some screens of “Map Office,” the “Flow Bar,” Current Time, and the next program start time is displayed.

If there are NO “Program Starts” for today, then it will display “Tomorrow” (refer to above). If there are Program Starts for today, then it will display the time of the next “Start.”

If there is more than one “Program Start” for today, it will only display the “next” Program Start.

At the top center of the “Front Office” screen and on some screens of the “Map Office,” the “Flow Bar” and the “System STATUS” is also displayed.

a) The “System Status” bar indicates if the program is in communication with the field.

b) An indicating LED light gives the status of operation in the field, etc.
c) Click on the Status Bar.

A drop-down screen shows a description of what the various Status Indications mean.

At the top center of the “Front Office” screen the System “ET” Value is displayed on the ET Bar.

a) The “Weather Data” screen can be displayed by clicking on the ET Bar. (Except for the Stratus II program. “Weather” is not available with the Stratus II software). This screen shows where the System “ET” value is obtained.
b) System “ET” value is the “Net ET” value shown for the current day.

c) The “Net ET” value is the “Default ET” value if there is No Weather Station on the system.

d) Otherwise it is calculated from the Weather Station Data collected.

**Today’s “ET”/Weather Data**

This feature provides for a seven (7) day history of data collected by the Weather Station or manual data entered.

a) The data collected by the Weather Station or that is manually entered, for the last seven day period, is shown across the top of the table.
**DATA PRESENTED IN TABLE**

<table>
<thead>
<tr>
<th>Daily Weather “ET” value</th>
<th>Daily Weather “Rainfall”</th>
<th>Amount of “accepted” Rainfall</th>
<th>Rain Bucket Capacity</th>
<th>Net ET Value for the Day</th>
</tr>
</thead>
<tbody>
<tr>
<td>The ET value as calculated from the weather data is collected by the “On Site” Weather Station, but NOT taking into account any rainfall.</td>
<td>The ACTUAL amount of rainfall that occurred in this 24 hour period, taken from the data collected by the Rain Gauge.</td>
<td>That amount of rainfall that would infiltrate into the soil and be useful to the plant. This is set by the user and is usually based upon soil infiltration rates for the course conditions.</td>
<td>This is the amount of accumulated “accepted” rainfall that has not yet been accounted for by the daily ET value.</td>
<td>This value is the ET value to be used for the System ET for the day, based on the daily “Weather” ET value minus the amount of “accepted” rainfall in the Rain Bucket.</td>
</tr>
</tbody>
</table>
SETTINIGS TO BE MADE

In addition to the above table data, several other settings need to be made for the system to function efficiently.

1. **Maximum Applied ET Value**
   - It is recommended to enter a “Maximum ET” value, which will “clamp” the system to this maximum value, should the Weather Station or an individual attempt to manually enter a higher NET ET value.

2. **Default ET Value**
   - A default ET value may be entered, which will be used for the daily NET ET value **ONLY** in the event that the system fails to make contact with the Weather Station, when programmed for automatic upload. The system will pick up the “Default ET” value at **5:00 P.M.** each day if contact with the Weather Station is NOT made, or in case a Weather Station is NOT being used on the system.

**NOTE!**

DO NOT manually enter a NET ET value **before** 5:00 P.M. The “default ET” value will be “picked-up” at 5:00 P.M. and replace the manually entered value. Instead, change the “default ET” value to the desired ET for the day. In this way, the value will be “picked-up” at 5:00 P.M., and the system will then adjust as desired.
3. Maximum Hourly Rainfall (MHR)  
A maximum “Hourly Rainfall” value may be entered.  
This should be a value close to the infiltration rate of the soil.  
If a greater amount of rainfall occurs in a given hour, the system will only accept the maximum hourly rainfall established for that hour. The remainder that is not accepted would actually be lost in “run off” so should not be counted.

4. Rain Bucket Capacity  
A Rain Bucket Capacity value can be entered. This value should be close to the holding capacity of the soil. This prevents accounting for a greater amount of rainfall in the Rain Bucket than the soil can actually hold. The additional amount would be of no value to the plant.

**MANUAL DATA ENTRY**

In addition to the above table data entries, several other settings need to be made for the system.

a) For an on site Weather Station, it is necessary to enter an “Up Load Time,” at which time the computer will contact the Weather Station, retrieve the weather data that has been gathered over the past 24 hours, calculate a Weather ET value and automatically update the table.  
If there is not a Weather Station on the system, manually enter data into the ET Settings table by clicking on the cell and then entering the desired data.

b) Entry of a manual “Net ET” value in the cell (not using the “default ET” value and having it automatically enter at 5:00 P.M.) will automatically **EMPTY** the Rain Bucket.

**BEFORE ENTRY OF MANUAL “NET ET” VALUE**

Rain Bucket still has a large quantity of water in it. (1.91)
AFTER ENTRY OF MANUAL “NET ET” VALUE

Rain Bucket is now “Empty.” (0)

Manual “Net ET” value of .18 has been entered

NOTE ! If “Net ET” value is entered manually and the Rain Bucket is NOT empty, enter the desired “Net ET” value in the “default ET” cell and it will automatically be entered as the “Net ET” at 5:00 P.M.

A reference ET value (“ETr”) may be entered into all of the central control systems. This reference ET (“ETr”) value is intended to represent the nominal weather condition, that reflects the default Run Times that were entered in the Station Data Base tables, during the “Start-Up” process.

To enter or change the “ETr” value, it can be accessed from the tool bar on the “Front Office” screen.

“Front Office” Tool Bar
a) Click on the “Waterbudget” icon.

b) The “Waterbudget Setting” screen will now be displayed.

c) “ETr” value may be entered or changed by clicking on the cell and then entering the new value.

NOTE! If NO “ETr” value is available, Stations without Precipitation Data will use the default station “Run Time” with NO adjustment.

a) The “System Waterbudget Factor” can be set anywhere from 0% to 200%, in 1% increments.

   Set desired Waterbudget Factor by using the two Arrow buttons or using the center “slider” bar.

b) The Waterbudget setting will be displayed in the “System Water-budget” window and on the meter dial.

NOTE! In using the Waterbudget method of controlling the system, keep in mind that there are three (3) levels at which Waterbudgeting may be applied. (1) At the System level the Waterbudget factor will adjust ALL Programs. (2) At the Program level the Waterbudget factor will adjust ALL Schedules within the given Program. (3) At the Schedule level the Waterbudget factor will adjust each individual Schedule only. Any of these factors work in conjunction with each other.
The various System Settings may be accessed for review and/or for changing, by clicking the “System Settings” icon, located on the tool bar at the top of the “Front Office” screen.

a) Click on the “System Settings” icon on the tool bar (Group 1).

b) The “System Settings” screen for “Hardware” by default, will be displayed.

Four Types of Systems are possible: 2-Wire Satellite System (Hard Wired), Link Wireless Satellite System, Decoder Based System (No Satellites), Hybrid System (combination of the three). Refer to Section 1 Start Up process to review 2-wire link and decoder based systems. The following is the process for creating a Hybrid System.

Hybrid System – Combination of the Three Systems

a) To access the “Hybrid” System, click on the “Hybrid” System icon.

b) The “Hardware” settings screen will now be displayed.
Designate the System Type for the specified “Slave Port” on the “Smart Switch”

Designate the “Smart Switch” outlet that is to be used for this system. Click on the Arrow button and then select the “Slave Port” desired.

Set the appropriate “Slave Port” for each of the “Smart Switch” outlets that will be used for the various type systems. Click on the arrow button to display the drop-down screen.


International Settings

This feature provides for selecting various languages and flow units and is accessed by clicking on the “System Settings” icon located on the tool bar of the “Front Office” (2) screen.

a) Click on the “International Settings” icon at the top of the System settings screen.

b) The “International Settings” screen will now be displayed.

Make any changes
This feature sets the Total System Capacity for the system and is accessed by clicking on the “System Settings” icon.

a) Click on the “System Capacities” icon at the top of the System Settings screen.

b) The “System Capacities” screen is now displayed.

Follow directions given on this screen if any changes are required to be made.

This feature gives access to the various tables, such as: ET Adjust Table, Cycle Time Table, Soak Time Table and Precipitation Data Table. These tables are accessed by clicking on the “System Settings” icon.

a) Click on the “System Data Tables” icon at the top of the System Settings screen.

b) Click on the drop down arrow to choose the table desired.

c) Make any changes and click OK.
The “Dry Run” feature tests the system Programs, on an accelerated time basis WITHOUT actually operating any stations or sprinklers in the field. A Flo-Graph will be generated and will present a graphical picture of the Flow Demand on the system during the irrigation cycle. The system refers to the Flo-Manager and Station Data Tables, for station/sprinkler flow data and to generate the Flo-Graph. This data has been entered during the “setup” of the system.

The “Dry Run” feature can be accessed from the tool bar on the “Front Office” screen.

a) Click on the “Dry Run” icon on this tool bar.

b) The “Dry Run” screen will now be displayed.

c) Select the DAY for the “Dry Run” to occur, by clicking to put a checkmark in the square under it. The default will be for “Today.”

d) Enter the “Start” & “Stop” Time for the “Dry Run.”

e) For the Start and Stop Times for schedules, as well as programs, click in the “Report Schedules?” square on the Screen.
Based on the Start times for the programs, set the Start and Stop times for the “Dry Run.”

In this example we will set the “Start time” as 6:00 P.M. and the “Stop time” as 6:00 P.M. Wednesday for “Day Selection” is O.K., since these programs are set to operate everyday.

f) Now click on the “START” button at the top of the “Dry Run” screen to start the Dry Run.
Upon completion of the “Dry Run” a Flo-Graph is available by clicking on this icon

As the “Dry Run” begins, the screen will automatically change to the Flo-Graph screen.

The Flow Demand on the system is shown graphically on the Flo-Graph.

The time is being displayed as the “Dry Run” progresses.

The TOTAL gallons used is also displayed during the “Dry Run.”

The graph displays the Flow Demand on the system for the time period requested.

The Cirrus and Nimbus II systems can actually manage up to six (6) different pumping stations; the Stratus II system can manage up to two (2) different pumping stations. The flow demand on each of these stations will be shown by the “color” of graph as indicated by the color squares on the left side of this screen.

By clicking on the “Schedule Log” icon at the top of the screen, a printed list of the “Dry Run” activity will be displayed.

This list may be printed by clicking on the “Print” icon.
g) In addition to the Flo-Graph and a printout of the “Dry Run,” a log of the “Dry Run” is also generated.

h) This log shows each station that has operated and the amount of time it has operated.

This feature provides a number of information screens on present “System Activities” and/or past “System Activities.” The areas covered under this feature are as follows:

- Course Log
- Posted Log
- Dry Run Log
- Course Monitor/DMA
- ET Spreadsheet
- Address View
- Default Run Time
- ET Adjust %
- Station Adjust %
- Cycle Time
- Soak Time
- Flo-Zone
- Precip (in/hr)

The Monitor/Log feature may be accessed from the tool bar (Group 1) on the “Front Office” screen.

a) Click on the “Monitor Log” icon on this tool bar.
b) The Monitor Log screen will now be displayed.

c) Click on the down arrow to display a drop-down menu listing the various logs available.

**COURSE LOG**

The “Course Log” displays the number of minutes that each individual station has operated since the last time the log was “reset.”

The “Course Log” is automatically displayed as the default screen once the “Monitor/Log” icon on the tool bar of the “Front Office” screen is clicked.

Any station that is presently in operation will be displayed with a red cell background, and will have the letter R after the number of minutes it has operated since the log was last reset. A station that is in the “Soak” mode that has remaining time to operate is displayed with a blue cell background and the letter S after the number of minutes it has been in operation. A cell background in yellow with the letter N indicates that station was programmed to operate, but there is no “feedback” from the station. It will register “0” time and is an indication that there may be a problem with the station and/or controller.

**DRY RUN LOG**

The “Dry Run” log displays the number of minutes that each individual station would actually operate during an irrigation cycle – even though the “Dry Run” is performed on an accelerated basis. The “Dry Run” assumes that every thing would operate satisfactorily in the field, even though none of the actual operation of sprinklers in the field will take place during the “Dry Run.” The information is organized by hole and by area within the hole.
**COURSE MONITOR/DMA LOG**

This feature monitors stations that are presently in operation, or have been operated but have “No Feedback,” and stations that were posted for operation and will operate as soon as the system can work them into the Flo-Manager scheme. These are stations that have been posted from programs that have been started.

All stations of a program are posted to this screen when started. The total amount of time to operate is placed in the appropriate cell. The various stations will be operated as they are worked into the Flo-Manager scheme. A station in operation will have a red cell background and the letter R after the time left to operate. A cell with a white background has not yet been placed into operation and the amount of time left to operate is shown. A station in the “SOAK” mode will have a blue background and the letter S after the time left to operate. A station cell with a yellow background and the letter N after the time to operate, indicates a station that is programmed to operate but has “No Feedback,” therefore may have a problem and should be checked.

**ET SPREADSHEET**

The “ET Spreadsheet” feature displays the number of minutes that each station will operate in a given cycle according to the system “ET” value, ET Adjust Factor, and Station Adjust Factor. When the “ET Spreadsheet” is first displayed, the data will be based on the system “ET” value for the present day.

The system ET Value is displayed on the window in the top center of the chart. The Total gallons of water that would be required is shown in the window at the top right of the chart. This is NOT to be confused with the Total gallons that might be required for the irrigation that will take place on the next cycle. This figure displayed here is if ALL stations were to operate, and this may not be the case for any given Irrigation Cycle.
**Importance of “ET”**

The importance of “ET” can be quickly seen by observing the total gallons of water that would be required for the present system ET value. For example:

For a System ET Value = 0.24  
Total Gallons = 1,097,658

Compare this figure with the total gallons that would be required if the system ET value were just 0.01 ET less.

In that case, with an ET value of 0.23, the total gallons required are:

For a System ET Value = 0.23  
Total Gallons = 1,056,890

The difference between these two conditions is - 40,768 gallons (1097658 – 1056890)

Thus we see that just 0.01 ET value change can result in 40,768 gallons difference. If the ET Value were actually only 0.23 today rather than the 0.24 we show, it would mean a waste of 40,768 gallons of water. This shows how important an accurate ET Value is, and the benefits in water savings and pumping costs that can be derived from a weather station on site.

**ADDRESS VIEW**

*Satellite 2-wire System or Satellite Link System*

This feature provides the Satellite Group Number, the Satellite Channel Number, and the Satellite Station Number for each station on a course.

**Example:**  
3 / 03 /08
**Decoder Based System**

This feature provides the Decoder Address Code Number for each Decoder on a system.

**DEFAULT RUN TIME VIEW**

This feature displays the “Run Time” (in minutes) that is presently programmed for each station on a system. Any changes that are made in the “Station Detail” table will automatically be reflected in this chart.

**STATION ADJUST VIEW**

This feature displays, in chart form, any “Station Adjust” factors entered for all the stations on a system. Changes need to be made in the “Station Detail” table, and then they will automatically be reflected in this chart.

**FLO-ZONE VIEW**

This feature displays, in chart form, the Pumping Station Number and the Flo-Zone Number that has been assigned to each station on a system.

**POSTED LOG**

This feature displays, in chart form, the number of minutes each station will operate during the next scheduled program.
This feature provides, in graphic form, a history of the Flow Demand on the system as the various programs or stations have operated. The Flo Graph displays GPM Flow versus Time, for each pumping station (if there is more than one pumping station involved with the system), or it can show a combined flow graph for ALL pumping stations together. The graph may be used to show flow for an actual irrigation cycle or for a “dry run.” An historical record of the flow graphs is maintained and any of these graphs may be displayed at any time.

The Flo Graph is accessible from the “Front Office” screen Tool Bar.

a) Click on the Flo-Graph icon.

b) The “Flo-Graph” screen will now be displayed, as shown here.

Click to get a Graph for all the pumping stations - combined

The six possible pumping stations individual graphs will be in the corresponding color.

Hour of the Day along horizontal axis
c) To display a graph, click on the down arrow at the right side of the “Today” window. This will display a drop-down menu with a listing of graphs available.

d) Click on the desired Graph.

e) The selected graph will be displayed, as shown below.

f) To get an “enlarged” graph of just a portion of a graph, click on the “ZOOM” button, located on the right upper part of the FloGraph screen.
g) The FloGraph Zoom screen will be displayed.

h) Enter the “Start Time” of the desired portion of the graph.

i) Enter the “Stop Time” for the desired portion of the graph.

j) Click OK.

k) A screen will appear with the specified “Zoom In” time period from the FloGraph.

l) The portion of the FloGraph specified (for example, from 8:00 AM to 12:00 PM) will be displayed.

*Indicates the Flow Demand (374 GPM) at this point in time (10:00 AM)*

“Sliding Scale” to view Flow Demand at various points in the cycle

*Stations in operation at the viewpoint (10:00 AM) of the Graph*
m) By using the “sliding scale,” Flow Demand may be viewed for any point in the cycle.

n) At the selected view point, the stations in operation at that time will also be displayed.

During an Irrigation Cycle, the FloGraph may be viewed while being generated. It will also display the Flow Demand at the present moment in time, as well as a list of all stations presently in operation.

View Point is 9:35 A.M. with a Flow Demand of 558 GPM

Stations in operation at this viewpoint (9:35 A.M.)

“Flow Bar” indicating present flow demand indicating 867 GPM demand

Present Time of Day 9:39 A.M.

View Point of Graph 9:39 A.M. with flow demand of 867 GPM

a) Graph is being generated as irrigation cycle is in progress.

b) Graph will be stored for future viewing at any time desired.

Stations presently in operation at the viewpoint in time (9:39 A.M.)
Click on the Simple IRR icon to bring up the following screen:

- Click on the New Simple-IRR Event icon to create a DMA Event
- Click on the “X” to delete the DMA Event
- Click here to toggle between Satellite View and Course View
- Click on the Monitor icon to view the Monitor/Log

This is an example of a Simple IRR Event.

**NOTE:** When an event time is entered, the “one time only” window will appear. If the box is left unchecked, this event will occur everyday at the allotted time.
SECTION 7

Miscellaneous Functions
THE FREEDOM SYSTEM

The Freedom system is available for all three central control systems. However, in order to access it with the Nimbus II or Stratus II software programs, a software module must be purchased.

The Freedom System consists of a Central Base Unit that is connected to one of the Serial Ports of the Computer. Remote communication and control of the system is made possible with the use of a Handheld Portable Radio Unit or by means of remote telephone communication.

If there is no Freedom System connected to the system, this will be indicated on the tool bar of the “Front Office” screen by a circle with a diagonal line through it, superimposed over the Freedom icon.

If a Freedom system is connected to the system, the Freedom icon will be shown without a circle superimposed over it.

Configuring Serial Port for use of the Freedom System.

The Freedom System communicates with the system via one of the computer’s serial ports.

a) To configure a port for use by the Freedom System, click on the “System Settings” icon on the tool bar.
The Freedom System Features

The Freedom System provides for golf course staff to use a handheld radio or a remote telephone from field locations to operate the system remotely. The Freedom System provides the features of remote control for:

1. Turning programs ON and OFF
2. Operating individual stations

Access to the Freedom System

To access the Freedom System, Click on the “Freedom” icon on the tool bar at the top of the “Front Office” screen.

a) The Freedom Window screen will be displayed with the default values.

b) Defaults are:

   Window Opens: 12:00 AM
   Window Closes: 12:00 AM
   Window Status: Open

   Therefore Window is open at ALL times.
Freedom Window Settings

From the Freedom Access Window screen, it is possible to set the window to “Open” and “Close” automatically at a specific time each day. The window can also be set to be “Open” at all times or “Closed” indefinitely. Closing the Freedom Window secures the system by preventing access via the Freedom System. It is also possible to manually override the normal settings when the window needs to be opened or closed in special situations.

a) From the Freedom Window screen, click on the “Window Opens:” cell.

Enter “Password” (4321)

b) A “Password” screen will be displayed. Enter the Password Number of 4321, which will appear as –**** in the window of this screen. This is the “Password” required in order to change the window settings.

c) Click OK.

d) The Freedom Window will now be displayed with a prompt and an example time in the top cell of the screen.
e) **Example:** Opening time is to be at 6:30 AM.

Click on the “Window Opens:” cell - with the pointer to the right of the letter M. Use the “backspace” key to erase the present time. Then enter the New Desired Opening time.

f) Setting the Window Closing time can be done by following the same procedure for the “Window Closes:” cell.

**“Overriding” Window Settings**

To **Override** the current window settings – Click on the “Manual Override” button.

a) The “Password” screen will be displayed.

Enter the “Password” (4321), then click OK.
b) The Override Window screen will be displayed.

c) Select the condition now desired for the window. Example: Window to be “Closed.”

d) Click OK.

e) The screen will be displayed as shown here. Click OK when data is completely entered.

f) The Window “Opening” time can be changed by using the “sliding” scale to set a new time.

g) If it is desired to keep the window in this condition for an extended period of time, click on “Indefinitely.”
h) When settings are complete, click OK.

i) The Freedom Window will be displayed with the new status shown in the Window Status cell.

Present status of window is displayed here. When “closed” it is in Red. When “open” it is in Blue.

To “Clear” the window Setting, click on the “Manual Override” button.

To “Clear” the window Setting, click on the “Manual Override” button.

a) From the “Override Window,” click on the “Clear the Override” button.

b) The Basic Freedom Window is displayed, verifying that the window settings have been restored to their original settings.
Freedom Interpreter

At the top of the Freedom Window screen are two (2) Freedom Interpreter windows, which will indicate any entry data that is made to the system, either by the handheld radio or from a telephone.

The screen displayed here shows a typical entry. The top window displays the “key strokes” entered from the handheld radio or the telephone. The bottom window displays the command that was entered in “words.”

Example: Turn “ON,” at Hole #1 and on the Fairway, Station #8 and operate it for 5 minutes.

“Key Strokes” that were entered

Description of Command that was entered.
Freedom Command Chart

To display the Freedom Command Chart, click on the Information icon at the bottom right of the Freedom Window.

The Command Chart will be displayed as shown here.

GENERAL:

1. **ALL** commands are **STARTED** by entering the ## sign.
2. Each **INDIVIDUAL** command is **SEPARATED** by the # sign.
3. The **String** of Commands is **ENDED** by the ## sign.

**Example:** ## 1 # 1 # 3 # 6 # 7 # 8 # 12 ##

Turn “ON” Hole #1  
Area “Fairway”  
Time to Operate  
Stations #6, #7 & #8

**NOTE!** FOR FURTHER INFORMATION ON OPERATION OF THE FREEDOM SYSTEM – REFER TO THE FREEDOM SYSTEM OPERATIONS MANUAL.
The System Information icon, found on the “Front Office” screen tool bar, provides an update brief of the software. Here it is possible to review changes to and new features of the program. This information is relevant to the version of software being used. The version of the software will appear at the top corner of the screen. Refer to the version number when contacting your Rain Bird distributor or the Rain Bird Technical Services Department for any questions or help with the system.

![System Information icon](image)

**Version of Software is displayed here**

a) Click on the “System Information” icon and the Update Brief screen will be displayed.

![Update Brief](image)

The information will be current up to the Version of Software being used. Note that the Version number of the software being used is displayed at the top left corner of the screen. This version number may be needed in order to call for technical support.
The System Database Utilities provides access to the various Database files that may be needed later in regard to the system. These Databases may be accessed from the “Front Office” screen Tool Bar.

The Database Utilities screen will now be displayed.

- **Copy Database from . . .**
- **Save Database as . . .**
- **Open Database**
- **New Database**
- **Compact Database**
- **Designer Notes**
- **Check for Duplicate system Numbers Database Version and Date of Database**

Indicates the Database presently being used

Description of Database

**Current System Database:**

Shepherd Hill Golf Course

**Version:**

0.0.18 03/05/98
Opening a Database

a) Click on the “Open Database” icon at the top of the Database Utilities screen.

b) The “Open Database” screen will be displayed.

c) Click on the File Name for the desired Database to “highlight” the Name.

d) Click OK.

Saving a Database

To correctly save the Database and the map, exit completely out of the program and use the One Touch Backup icon on the windows desktop.

(i.e.) Cirrus Backup
Copy Database From Another Source

"Copy Database from . . . to (i.e.) C:\CIRRUS" icon

a) Click on the “Copy Database from . . . to (i.e.) C:\CIRRUS” icon at top of the Database Utilities screen.

b) Select file with proper 3 char extension to copy.

c) Type Description of Database.

d) Click arrow to the right of “Drives” cell to get a drop-down screen of drives available.

e) Click on the Drive wanted, to highlight it. Then click OK.

The designated file will be copied into the Cirrus, Nimbus II or Stratus II directory and can be retrieved at any time desired, for operation of the system.
Compact the Database

Compacting is the process of reorganizing the database on the hard drive so that the information can be retrieved quickly.

a) Click on the “Compact Database” icon at the top of the “Database Utilities” screen.

b) The “Database Utilities” screen is displayed and shows that the “Compacting Operation” is in progress for the current system database.

Once the “Compact Database” icon is clicked, the software finds all the pieces of the database and groups them together on the hard drive disk. A message appears on the screen saying the current database is being compacted. *This process can take several minutes to complete.*

As the system is used, the database files can become fragmented on the hard drive. The data remains intact, but it becomes spread out over various parts of the disk. Eventually, a fragmented database can slow down the system.

It is recommended to periodically compact the database to improve system efficiency. Compact the database at least once a week, or whenever the system response time seems to have slowed.
a) Click on the “Designer Notes” icon at the top of the “Database Utilities” screen.

b) The “Designer Notes” screen will be displayed.

c) Click on the arrow to the right of the DataBase Utility cell to access a drop down menu listing the various designer notes available.
Check for Duplicate System Numbers

“Check for Duplicate System Numbers” icon

a) Click on the “Check for Duplicate System Numbers” icon at the top of the Database Utilities screen.

b) The system will automatically check for duplicate numbers and display the findings of the search.

Retrieving a Database

a) If more than one database is saved, it is possible to retrieve an alternate database periodically. Click on the “Open Database” icon on the top of the Database Utilities screen.

b) Highlight the database to be retrieved, then click OK.
The Cost Estimate feature provides a water and energy cost “guesstimate” for each potential irrigation run. Specified data should be entered as instructed. The Cost Estimate feature will then automatically calculate and display a water cost, energy cost estimate and in addition a potential performance efficiency at which the program is operating.

The Cost Estimate feature may be accessed from the “Front Office” screen tool bar.

**“Cost Estimate” icon**

a) Click on the Cost Estimate icon and the Cost Estimate screen will be displayed.

b) Enter the data that is missing from the screen according to the conditions of the course.

c) See chart on the next page for more detail on data entry.
### Pump Power:

Enter the Pump Power

**EX:** .75 kw per hp - 10 gpm per hp

Pump Capacity: 1550/10 \times .75 = 116.25 kw

### Water Cost:

Enter the water cost per 1000 gallons

### Energy Cost:

Enter the energy cost per Kilowatt hour

### ET Value:

The ET value will automatically pull in from the ET Settings – Weather Station. This value may be changed if desired.

### Actual Irrigation Time:

Enter actual irrigation run time, which can be retrieved from a “Dry Run.”

### Pump Capacity:

Will automatically display

### Gallons to be Used:

Will automatically display

### At 100% Efficiency, This Should Take:

Will automatically display

### System Performance

**Irrigation Time Efficiency:**

### System Performance

**Water Cost:**

### System Performance

**Energy Cost:**

Will automatically display

---

**NOTE!**

The final “Cost Guesstimate” will only be as accurate as the information entered. Therefore, the more accurate the information that is entered into the table, the more accurate will be the Cost and Efficiency Results.
Designer Notes™

This feature provides a series of articles with the intent to communicate the system’s functional features and the application of these features in regard to the specific system.

The Designer Notes may be accessed from the “Front Office” screen tool bar.

“Designer Notes” icon

a) Click on the “Designer Notes” icon.

b) The “Designer Notes” Main screen will be displayed.

c) Click on the Arrow button to get a drop-down screen listing the various Designer Notes.

d) Review the Title List and select the Designer Note of interest, by clicking on the Title to highlight it.
e) The selected Designer Note will be displayed.

f) Additional information on this subject may be displayed by clicking on the down-arrow.

Password for Access to System Tests

This feature, by entry of the “Password,” provides access to a number of system tests that can be performed to troubleshoot the system. Normally this will not be used unless a Rain Bird Distributor Technician or a Rain Bird Technician is assisting in troubleshooting the system.

This feature may be accessed from the “Front Office” screen tool bar.
a) Click on the “Password” icon and the “Password” screen will be displayed.

b) Enter the password of **4321**, which will show as **** in the screen.

c) Press “ENTER.”

d) This will provide access to the system test features as indicated by the tool bar on the “Front Office” screen.

For a Satellite Based System

e) Click on the “Password” Tab and the Test tool bar will now be accessible.

f) Click on the “Test Probe” icon on the tool bar and the test screen will be displayed.
g) This Screen will be of NO value or meaning unless a qualified Rain Bird Technician is helping. If problems arise with the system, contact the Rain Bird Distributor for assistance.

h) To access the “Array” test screen, click on the “Array” icon.

i) The Test Screen will be displayed as shown here.

j) Again this Test Screen will have NO value or meaning unless a qualified Rain Bird Technician is helping. If problems arise with the system, contact the Rain Bird Distributor for assistance.
For a Decoder Based System

e) Click on the “Password Key” and the Test Tool Bar will now be displayed and accessible.

f) Again, the “TestProbe” icon and the “Array” icon on the tool bar should be ignored unless a qualified Rain Bird Technician is present. If problems occur on the system, contact a local Rain Bird Distributor for assistance.

g) To access the “Decoder Test” section, click on the “Decoder Test” icon on the tool bar.

h) The Decoder Test Screen will be displayed.

i) This screen is very useful in “testing” and “troubleshooting” the decoder based system.
DECODER SYSTEM DIAGNOSTIC TESTS

The Decoder Based System provides for a number of tests to be performed during system “check-out” and for “troubleshooting” a system.

On/Off Performance Test

- This test may be accessed by clicking on the “On/Off” test button at the top of the screen.
- The system will now turn on/off the decoders in the field.

Simple Decoder Performance Test

- This test may be accessed by clicking on the “Simple” test button at the top of the screen.
- The system will run a simple performance test of all the decoders, determining if they respond or not.
- The test results will be displayed in each of the cells for each of the decoders on the system.

Test Results:

- **Green Cell with the letter P in it = Decoder responded and is OK.**
- **Red Cell with the letter F in it = Decoder DID NOT respond – needs to be checked.**
**Solenoid Test**

a) This test can be accessed by clicking on the “Solenoid” test button at the top of the screen.

b) The system will now check each solenoid to determine if there is any current leakage to ground by the solenoid.

**Test of Communication Cables**

a) This test can be accessed by clicking on the “Cables” test button at the top of the screen.

b) The system will now run a test on the communication cables for leakage to ground.

**Thorough Decoder Performance Test**

a) This test can be accessed by clicking on the “Thorough” test button at the top of the screen.

b) The system will run a thorough performance test of all the decoders.
c) The test results will be displayed in each of the cells for each of the decoders in the system.

**Test Results:**

**Green Cell with the letter P in it =** Decoder responded and is OK.

**Red Cell with the letter F in it =** Decoder DID NOT respond – needs to be checked.

---

**Place System in 60Hz Mode for Testing of Communication Path with a Clamp Meter**

a) This test can be accessed by clicking on the “60 Hz” test button at the top of the screen.

b) The system communication cables will be placed in the 60 Hz mode to facilitate testing for “shorts” with a Clamp Meter.

**NOTE !** Any of the preceding tests may be terminated by clicking on the “Terminate” button.
Please note: In order to activate the Static Sensor for Nimbus II and Stratus II software systems, a software module keycode must be purchased. The Pulse Sensor does not require this purchase.

Sensors for Decoder Based systems are limited and integrated into the system in a different manner. Refer to Decoder Installation manual for complete details.

This feature provides for the setting up of various sensors for the system. Both “Static” and “Pulse” type sensors may be integrated into the system.

a) To access this feature, click on the “Smart Sensors” icon at the top of the “Front Office” screen.

b) A Smart Sensors “Selection” screen will be displayed.

c) There is a choice of either “Static” type sensors or

d) “Pulse” type sensors.

e) Click on the “Static” Sensor icon.
f) The “Static” Sensor screen will now be displayed.

- Static Sensor Definition icon
- Smart Sensor icon
- ‘Delete Sensor’ icon
- Simulate Conditions icon
- ‘Add Sensor’ icon
- N.O – Normally Open
- N.C – Normally Closed

- Enter the “ID” for the sensor.

- Enter any comments for this sensor.

- Default is for wire Group 1 – change this if required.

- Enter the Channel Number for this Sensor.

- Enter the Delay Time desired before action is taken when the sensor condition is “ON.”

- Enter the Delay Time desire before the action is stopped when the sensor condition is “OFF.”

- Status of sensor will be indicated, by the light being lit, when the sensor had reached its threshold and action has been taken.

- Additional Sensors may be added by clicking on the “Add Sensor” icon, which will then display another line to enter the desired sensor data.

- A Sensor may be deleted by first clicking on the Sensor to be deleted, and then clicking on the “Delete” icon.
e) Click on the “Pulse Sensor” icon.

f) The “Pulse Sensor” screen will be displayed.

To enter a Sensor and its data, click on the “Setup/Edit Sensor” icon at the top of the screen.
h) The Sensor “Setup” screen will now be displayed.

i) Enter the Name to identify this sensor.

j) Enter the Wire Group Number that this sensor is on.

k) Enter the Channel Number for this sensor.

l) Enter the Number of Gallons that is represented by each “Pulse” of the Sensor.

m) When all data has been entered, click OK to enter this data in the Sensor Table.

n) Other “Pulse” Sensors may be added in a similar manner.
SECTION 8

Weather Program
Smartweather™
Please note: This section will be available for the Stratus II software program in the future. For the Nimbus II software program Weather, Smart Weather Alarms and Multiple Weather stations are available with the purchase of the specific keycode software module.

The “Weather Program” may be accessed from the “Front Office” screen tool Bar.

a) Click on the “Today’s ET/Weather Data” icon.

b) The Weather Data screen will be displayed.

c) Click on the “Weather Program” icon button.
d) The Weather Program screen will be displayed.
If there is no Weather Station on the course, then use the “Virtual Weather Station #1” screen to enter data each day, for the following factors.

Minimum Air Temperature  Maximum Air Temperature
Relative Humidity        Wind Run
Solar Radiation          Rainfall

There are a number of ways to gather this data on a daily basis, such as local area airport, weather channel, individual instruments, etc. After the entry of data, the system will calculate a Weather ET value, which will be used to adjust the system.

**Minimum and Maximum Temperatures**

The minimum and maximum daily air temperature may be entered into the temperature section of the screen.

*Minimum Temperature can be entered by using the “Up” and “Down” arrows or the “sliding scale.”*

*Example:*

Minimum Temperature = 49.17 Degrees F.
Maximum Temperature = 86.67 Degrees F.
Relative Humidity

The daily Relative Humidity value may be entered into the Relative Humidity section of the screen.

*Relative Humidity value can be entered by using the “Up” and “Down” arrows or the “sliding Scale.”*

Wind Run

The Wind Run value may be entered into the Wind Run section of the screen.

*The “Wind Run” (in Miles per Hour) can be entered by using the “Up” and “Down” arrows or the “sliding scale”*

Solar Radiation

The Solar Radiation value may be entered into the Solar Radiation section of the screen.

*The Solar Radiation (langley) value may be entered by using the “Up” and “Down” arrows or the “Sliding Scale”*
Rainfall

The Rainfall value for the past 24 hour period may be entered into the Rainfall section of the screen.

*The Rainfall value (inches) may be entered by using the “Up” and “Down” arrows or the “Sliding Scale”*

Weather Station “ET” Value

With the above data entered, the system will automatically calculate the Weather ET value (ins/day). This is displayed in the “WS/Applied ET” section of the screen.

*Crop Coefficient displayed here - (can be changed) using “Up” and “Down” arrows*

*Applied “ET” value displayed here*

Plotting Weather Data

Click on the “Plot Data” icon on the Virtual Weather Station screen to “plot” the data entered.

The Weather Data entered will then be displayed in a graphic form.

*Relative Humidity (Green Curve)*

*Maximum Temperature (Red Curve)*

*Solar Radiation (Blue Curve)*

WEATHER DATA – PLOT SCREEN
Weather Data - Plot Screen Tool Bar

Plot Support Data
Plot ETo
Plot Daily Data
Start Date for Plot
Previous Time Period
Next Time Period
Print
Print Setup
Exit Plot

Plotting “ETo”

To “plot” the “Eto,” click on the “Plot ETo” icon on the Weather Data – Plot Screen tool bar.

The “ETo” graph will be displayed.

With the Weather “ET” value from the “Virtual Weather Station” screen and the Rainfall figure, it is now possible to go to the “Weather Data” screen and manually add this data in order to get a “NET ET” value for today.

a) Enter the “Weather Station ET” value, as calculated on the “Virtual Weather Station #1” screen.
b) Enter the “Rainfall” figure.
c) The accepted rainfall figure will automatically be entered.
d) The “Rain Bucket” capacity will also be automatically entered.
e) The resultant “NET ET” value will be calculated and automatically entered.
Weather Station on the Site

If a Weather Station is present on the site, then it needs to be set up in the following manner. The Weather Station will poll the instruments, every five seconds over a 24-hour period. With this data, the system will then calculate a Weather ET value, which will be automatically entered into the Weather Data table at the designated “Download” time.

Weather Station Configuration icon (at the top of the Weather Data screen)

a) Click on the “Weather Station Configuration” icon.

b) The following general information screen will be displayed.

- Designate the type of units to be used by clicking on the units tab
- Select the type of modem being used
- Enter the COM port that is being used
- Designate the method of communication to be used (direct or modem)
- When all data is correct, click on the Save-and-Exit button
c) Select the Virtual Weather Station desired by clicking on the drop down arrow, and highlighting the desired station.

NOTE: At this time, the Weather Station may be renamed

d) The Weather Station Configuration screen will be displayed.

e) Enter the Latitude of the Weather Station location, by clicking on the cell and typing in the correct latitude.

f) Enter the Elevation of the Weather Station location, by clicking on the cell and typing in the correct Elevation (in feet).

g) If telephone communication is used between the computer and the Weather Station, enter the telephone number being used by clicking on the cell and typing in the number.

h) Enter the “Download” time desired, for the computer contacting the Weather Station and downloading the weather station data. Click on the cell and enter the time, using military time.

i) When all data is correct, click on Save and Exit.

The “configuration” of the Weather Station is now completed. The data will be displayed on the screen for the specific Weather Station chosen.
To monitor the “Weather Station” online or to download the data from the Weather Station, go to the appropriate Weather Station screen. This can be accessed from the tool bar on the “Weather Data” screen.

a) First click on the “Weather Program” icon button.

b) The “Virtual Weather Station” screen will be displayed.
c) Next click on the drop down arrow and choose the appropriate Weather Station.

![Monitoring Weather Station](image)

d) For this example, the screen for Weather Station #1 will be displayed.

![Current Weather Data](image)

**MONITOR CURRENT WEATHER DATA**

a) To monitor Current Weather Data, click on the Monitor icon.

b) The Weather Station #1 screen data will be “filled in”, giving the current weather data as being sensed by the various sensors on the Weather Station.
DOWNLOAD CURRENT WEATHER DATA

a) To download the Current Weather Data, click on the “Download” icon.

b) The following screen will be displayed.

c) Enter the number of days of data desired.

d) Click OK.

e) The following screen will be displayed, with the computer calling the Weather Station to download the data.
f) The Weather Station #1 screen data will be filled in, showing the Downloaded Weather Station Data for the past 24 hour period.

Wind Run = 2.61 mi/hr displayed here
Relative Humidity of 16.95% displayed here
Max. Air Temp. of 86.67 deg. F
Min. Air Temp. of 49.17 deg. F displayed here
Solar Radiation of 520.900 Langleys is displayed here
Weather Station ET & Applied ET value is displayed here
Rainfall = 0 is displayed here

NOTE ! The above procedure is for a “Manual Download” of data from the Weather Station. An “Automatic Download” will occur at the time that has been programmed and the above procedure would not normally be used. However, the data on an “Automatic Download” will “fill-in” on the Weather Station Screen, just as shown in the screen above.
Upon an automatic or a manual download, the calculated Weather ET value on the Weather Station Screen will be automatically entered into the Weather Data screen.

Yellow cell indicates it is the default value
White cell indicates it is a value that was “downloaded” from the Weather Station
Green cell indicates the value was manually entered

The system would now automatically adjust all stations of the system, based on an ET value of 0.12 for the next cycle – thus just adding back the amount of water that the plant used, based upon weather conditions over the past 24 hours.
This feature programs certain “actions” to be automatically taken, based upon weather conditions. As an example, the system can automatically discontinue certain portions of the irrigation cycle should the wind reach or exceed a preset velocity.

The “Smart Weather” feature may be accessed from the “Front Office” screen Tool Bar.

a) Click on the “Today’s ET/Weather Data” icon.

b) The Weather Data screen will now be displayed.
c) Click on the “Smart Weather” icon.

d) The “Smart Weather” screen will now be displayed.

<table>
<thead>
<tr>
<th>ID of Sensor involved</th>
<th>Comments desired</th>
<th>Condition of Sensor Switch</th>
<th>Program or Schedule to react</th>
<th>Action to be taken when threshold is met</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rainfall 1</td>
<td>&gt;2&quot;</td>
<td>On</td>
<td>System Off</td>
<td></td>
</tr>
<tr>
<td>Rainfall 2</td>
<td></td>
<td>Reset</td>
<td>System On</td>
<td></td>
</tr>
<tr>
<td>High Wind 1</td>
<td>Wind &gt;5mph</td>
<td>On</td>
<td>Pause</td>
<td></td>
</tr>
<tr>
<td>High Wind 1</td>
<td></td>
<td>Reset</td>
<td>Resume</td>
<td></td>
</tr>
<tr>
<td>Ambient Temperature 1</td>
<td>&gt; 60 deg F</td>
<td>On</td>
<td>Start</td>
<td></td>
</tr>
</tbody>
</table>
Add a Sensor to Smartweather

a) To add a Sensor to the system, click on the “ADD” button at the top of the screen.

b) Next click on the NAME ID cell to display the “down arrow.”

c) Then click on the down arrow to get the drop-down screen.

d) Now click on the Name (ID) to give to the sensor.

e) The Sensor NAME (ID) will now be entered into the table.

f) To enter comments, click on the cell and type the comment.

sensor condition Default is “ON” alternative is “RESET”

g) Click on “Do What” cell to get “down arrow.”
Then click on “down arrow” to get “drop-down” screen. Click on the Action to be taken.
h) The final entry that needs to be made is to designate the Program and/or Schedule that is to be affected by this sensor.

i) Click on the “To Whom” cell to get the “down-arrow” displayed.

j) Then click on the down arrow to display the drop-down screen.

k) The drop-down screen allows user to specify the Program and/or Schedule that is to be affected by this sensor.

l) Other Sensors may be added in a similar manner.