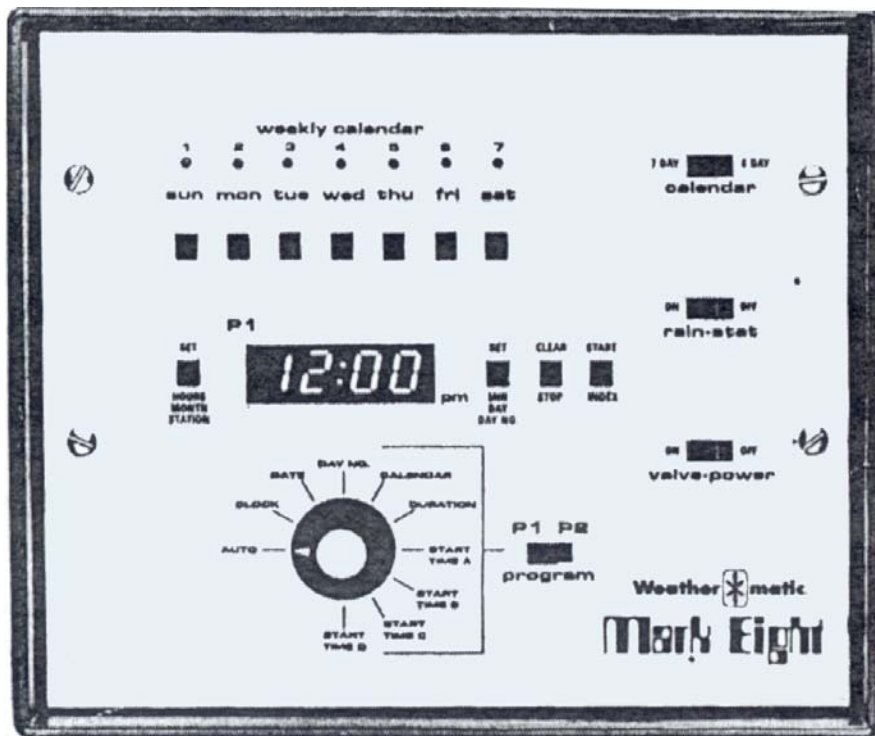




MARK SERIES COMPUTERIZED IRRIGATION CONTROLLERS



OPERATION MANUAL

CONTENTS

DESCRIPTION AND FEATURES.....1

CONTROLS AND INDICATORS.....2

MODES OF OPERATION.....3

OPERATION

A. Power-up/Back-up Operation.....4

B. Automatic Operation.....5

C. Semi-Automatic Operation.....9

D. Manual Operation.....9

PROGRAMMING HINTS.....10

PROBLEMS AND TROUBLESHOOTING.....12

WEATHERMATIC MARK SIX AND MARK EIGHT

DESCRIPTION AND FEATURES

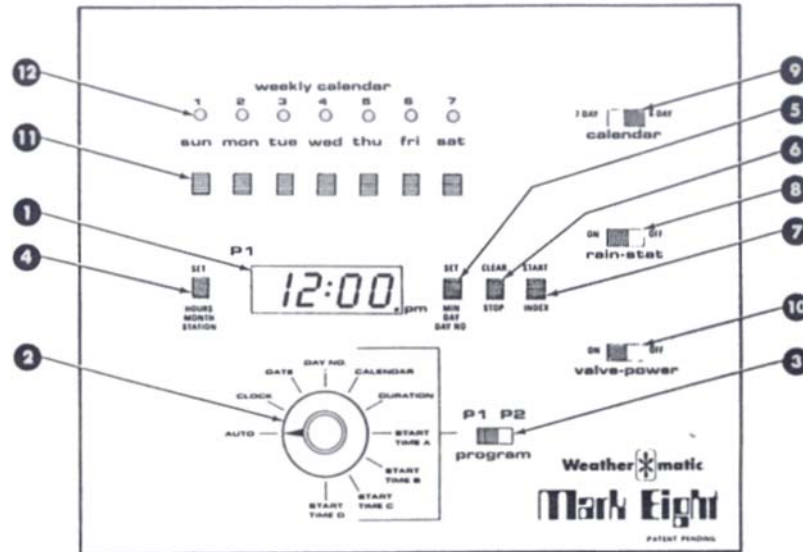
The Weathermatic Mark Six is a six-station microcomputer capable of handling two separate programs. It will handle up to four start times per program. The Weathermatic Mark Eight provides an eight-station microcomputer capability with the same program and start times as the Mark Six.

The Mark Six and Mark Eight offer unique features such as six-day calendar programming for odd or even day watering, or every third day watering if desired and a standard seven-day selection if only certain days of the week are required. Additional features of the Mark Six and Mark Eight follow:

- Easy to program. The Mark Six and Mark Eight controllers do not use a keyboard like many microcomputer controllers now on the market. Two pushbuttons and a function selector switch enter all data automatically into the computer.
- Easy inspection of your program is available by simply turning the function selector switch.
- A short sensor is provided to detect a partially shorted valve. It allows the controller to skip that station and continue with the next station in the program.
- A flashing LED display will indicate power failure or a partially shorted valve.
- True dual programming is provided, in which any station may be assigned to either or both programs. Station durations are independently variable when a station is assigned to both programs.
- A rechargeable battery back-up system is provided to retain the program, including the time of day, for approximately 60 minutes in the event of a short-term power failure.
- A back-up watering program is provided when the controller has been without power for an extended period of time.
- Each program incorporated in the Mark Six and Mark Eight may be started at any time up to four times per day.
- In event of a power failure, all valves automatically close. The program continues with next programmed station when power is restored.
- A Rain-Stat switch is provided to allow the controller to over-ride a Rain-Stat (optional) deactivation.
- A valve power switch is provided to switch off power to all stations without losing the program.

CONTROLS AND INDICATORS

The Weathermatic controller front panel consists of the following controls and indicators:



CONTROLLER FRONT PANEL

KEY	CONTROL OR INDICATOR	FUNCTION
1	Digital Display (LED)	Displays; date, hour, start time, duration, month, day number, A.M. or P.M., Program 1 or 3, and station numbers.
2	Function Selector Switch	A 10-position switch, used to select a combination of settings to develop a program.
3	Program Selector Switch	Selects either Program P1 or P2.
4	Hours/Month/Station Pushbutton	Used to set desired hours, month, and station on digital display.
5	Minutes/Day/Day No. Pushbutton	Used to set desired minutes, day, and day number on digital display.
6	Clear/Stop Pushbutton	Clears or stops current program/entry in controller.
7	Start/Index Pushbutton	Stops current station from watering, moves to next station in programmed sequence. Will also start a program.
8	Rain-Stat Switch	Rain-Stat switch is provided to allow the controller to over-ride a Rain-Stat (optional) deactivation.
9	7 Day/6 Day Calendar Switch	Allows for selection of either six- or seven-day watering cycle.
10	Valve Power On/Off Switch	Terminates power to stations. Will, however, retain existing program.
11	Watering Day Pushbuttons	Allows for selection of specific days for watering.
12	Watering Day Indicator Light (LED)	Lights to indicate day selected for watering

MODES OF OPERATION

The Mark Six and Mark Eight have four modes of operation. Each mode is designed to provide a specific service and allow maximum use of the system. Brief descriptions of each mode are listed below. More detailed information concerning actual programming can be found in Section IV, OPERATION.

A. POWER-UP/BACK-UP OPERATION

Initial state controller is in when power is first applied, pre-programmed for watering times and duration. Also performs as a back-up watering system in the event of a power failure. Controller uses two rechargeable nine-volt batteries (not included) designed to maintain the program for approximately 60 minutes.

B. AUTOMATIC OPERATION

Lets the user select various watering programs, such as watering times, days designated for watering, and watering durations per station.

C. SEMI-AUTOMATIC OPERATION

Used to start a preprogrammed cycle if additional watering is desired.

D. MANUAL OPERATION

Used to select a single station for watering.

OPERATION

A. POWER-UP/BACK-UP OPERATION

When the controller is first connected to a power source, or power is restored after the controller has been without power for a long period of time, the display will be flashing and the controller will set up the following program values. No station will be on! Set Program Selector Switch to P1 and rotate the Function Selector Switch through the following positions.

FUNCTION SELECTOR SWITCH POSITION	DIGITAL DISPLAY INDICATION
a. Auto	12:00 (Flashing)
b. Clock	12:00 (Flashing)
c. Date	1.1 (January 1)(Flashing)
d. Day No.	1 (Sunday)(Flashing)
e. Calendar	Watering day indicator (LED) lights flashing.
f. Duration (see NOTE)	1:10. (Flashing)
g. Start Time A	1:00. (Flashing)
h. Start Time B	OFF (Flashing)
i. Start Time C	OFF (Flashing)
j. Start Time D	OFF The Digital Display will stop flashing when the function Selector Switch has been rotated through all positions, pausing one second at each position starting with AUTO.

NOTE: ALL STATION DURATION TIMES WILL BE 10 MINUTES WHEN PROGRAM SELECTOR SWITCH IS SET TO P1 AND ON P2.

Initial power-up will place the controller into a known state. Note that this power-up program will initiate a watering cycle one hour after the controller is turned on unless action is taken to do otherwise.

The Mark Six and Mark Eight are equipped with a battery back-up (batteries not included) designed to maintain program and clock time in the event of power failure; however, stations will not operate until power is restored, and any station which is on at time of power loss will turn off. Once power is restored the controller will activate the next scheduled station on the interrupted program. The Digital Display will flash when power has been restored to the controller or a faulty valve exists (see TROUBLESHOOTING in Section V, PROBLEMS).

B. PROGRAMMING FOR AUTOMATIC OPERATION

1. To place the Mark Six or Mark Eight in an automatic programming mode, complete all steps in Paragraph A above, POWER-UP/BACK-UP OPERATION, then set the Function Selector Switch back to AUTO.

System Programming: Read the steps outlined below, then perform the program steps starting with setting the current time.

a. Set Current Time.

STEP	PROCEDURE	INDICATION
1	Set function selector switch to CLOCK. <i>NOTE: A DOT NEXT TO MINUTES INDICATES P.M.</i>	Digital Display will read 12:00 P.M. on Initial turn-on.
2	Press HOURS/MONTHS/STATION pushbutton and set to Current Hour.	Digital Display will read current hour.
3	Press MIN/DAY/DAY NO. pushbutton to Current Minutes.	Digital Display will read current hour and minutes.

b. Set Current Date (Month/Day).

STEP	PROCEDURE	INDICATION
1	Set function selector switch to DATE.	Digital Display will read date: month and day (1.1) on initial turn-on.
2	Press HOURS/MONTH/STATION pushbutton and set to Current Month. Jan = 1, Feb = 2, Mar = 3, etc.	Digital Display will read 1 thru 12 until month selected.
3	Press MIN/DAY/DAY NO. pushbutton to Current Date, Day 1 thru 31 days of the Month.	Digital Display will read 1 thru 31 on right side until date selected. Digital Display will display month and day.

SET NOTES 6 AND 7, "PROGRAMMING HINTS."

c. Set Current Day No.

STEP	PROCEDURE	INDICATION
1	Set function selector switch to DAY NO.	Digital Display will read 1 thru 7 on right half of display (1 on initial turn-on).
2	Press MIN/DAY/DAY NO. pushbutton to show desired day number. Select day number to correspond with weekly calendar. (Sun =1, Mon =2, Tue =3, Wed =4, Thur =5, Fri =6, Sat =7)	Digital Display will move from 1 thru 7 on right half of display.

NOTE: ANY TIME A CONTROLLER PUSHBUTTON IS HELD FOR MORE THAN 10 SECONDS, THE DISPLAY RATE WILL BE FASTER.

d. Set Calendar.

Before proceeding to the steps outlined below for selecting days on which you wish watering to occur, you should read the following explanation of 7-day and 6-day calendar modes. You will then be ready to select the program mode which will best suit your watering requirements.

7-DAY CALENDAR

The 7-day calendar mode allows you to select specific days of the week for your watering program. For example: Monday, Wednesday, Friday. In the 7-day calendar mode, your system will water on the same days of the week.

To select watering days, disregard numbers 1 thru 7 on the weekly calendar and refer only to the days (SUN-MON-TUE-WED-THUR-FRI-SAT).

6-DAY CALENDAR

The 6-day calendar mode is used to select even day, odd day, or every third day watering. In the 6-day calendar mode, the watering program will begin with the first day you set and will continue the frequency schedule you have selected. In other words, watering will occur according to frequency schedule rather than specific days of the week. In the 6-day calendar mode, the 7th position switch (Sat.) is inoperative. Positions 1 through 6 (Sun-Fri) are used to set the watering schedule.

1. **EVEN DAY SELECTION** is accomplished by pressing every other day switch starting with the first pushbutton switch that is an even calendar day number (i.e., 2nd, 4th, 6th, etc. Remember that the switch position number is not the same as the calendar day number).
2. **ODD DAY SELECTION** is accomplished in the same manner as even day watering except that every other day switch is pressed starting with the first odd calendar day number.
3. **THIRD DAY WATERING** is accomplished by pressing calendar day switch positions 1 & 4, 2 & 5, or 3 & 6.

NOTE: IN THE 6-DAY CALENDAR MODE, SET DAYS TO WATER FOR THE CURRENT 6-DAY PERIOD. THE CALENDAR WILL AUTOMATICALLY ADJUST FOR THE FOLLOWING 6-DAY PERIODS. 6-DAY CALENDAR MODE PROGRAMS WILL NOT WATER ON THE LAST DAY OF MONTHS WITH 31 DAYS.

SEE "PROGRAMMING HINTS," FOR EXAMPLES.

NOTE: ANY TIME A CONTROLLER PUSHBUTTON IS HELD FOR MORE THAN 10 SECONDS, THE DISPLAY RATE WILL BE FASTER.

STEP	PROCEDURE	INDICATION
1	Set program selector switch to P1.	Slide switch in P1.
2	Set 6 DAY/7 DAY calendar switch.	6 DAY or 7 DAY
3	Set function selector switch to CALENDAR	Watering day indicator lights will illuminate.
4	Select days desired by pressing watering day pushbuttons to turn on or off.	Days selected for watering indicator lights will be lit.

e. Set Duration.

STEP	PROCEDURE	INDICATION
1	Set function selector switch to DURATION	Digital Display will show station numbers on left, duration on right in minutes.
2	Select Station by pressing HOURS/MONTHS/STATION pushbutton.	Station numbers will move from 1 through 6. (Mark Eight shows 1 through 8).
3	Set duration time for station 1 by pressing MIN/DAY/DAY NO. pushbutton.	Duration time increases from OFF to 99 minutes. Stop at Desired duration time.
4	Follow steps 2 and 3 to set station 2 thru 6 on Mark Six and 2 thru 8 on Mark Eight.	

CAUTION ALL UNUSED STATIONS MUST BE TURNED OFF BY SELECTING STATION NUMBER AND PRESSING CLEAR/STOP PUSHBUTTON.

f. Set Start Times.

STEP	PROCEDURE	INDICATION
1	Set function selector switch to START TIME A.	Digital Display shows 1:00 PM.
2	Push HOURS/MONTH/STATION pushbutton for desired start time hour.	Digital Display shows desired hour.
3	Push MIN/DAY/DAY NO. pushbutton for desired start minutes.	Digital Display shows desired minutes.
4	Start times for B, C, and D are set the same way as start time A. Any unused start times must be set to OFF.	

NOTE: EACH ADDITIONAL START TIME (B, C, D) MUST BE AT LEAST 1 MINUTE AFTER COMPLETION OF PREVIOUS PROGRAM.

g. Program P2.

NOTE: PROGRAM P2 PROVIDES THE USER A SECONDARY INDEPENDENT PROGRAM FOR WATERING. IT MUST BE PROGRAMMED IN THE SAME CALENDAR MODE AS P1 (6 Day or 7 Day). FOR EXAMPLE; IF P1 WAS PROGRAMMED ON THE 6 DAY CALENDAR MODE, P2 MUST BE PROGRAMMED ON THE 6 DAY CALENDAR MODE.

STEP	PROCEDURE	INDICATION
1	Set program selector to P2.	Digital Display shows OFF, unless previously programmed.
2	Set function selector switch to CALENDAR.	No indication unless previously Programmed.
3	Select watering days on weekly calendar by pressing watering day pushbuttons.	Days selected for watering indicator lights will be lit, days Not selected for watering indicator lights should be off.

h. Set Duration.

STEP	PROCEDURE	INDICATION
1	Set function selector switch to DURATION.	Digital Display will show station number on left and time on right.
2	Select desired station number by pressing HRS/MO/STA pushbutton.	Selected station number on left and duration on right.
3	Set duration time for station 1 by pressing MIN/DAY/DAY NO. pushbutton.	Indicator will show minutes selected for watering.
4	Follow steps 1, 2 and 3 to set station and duration for other stations desired.	

i. Set Start Times.

STEP	PROCEDURE	INDICATION
1	Set function selector switch to START TIME A.	Digital Display OFF.
2	Press HOURS/MONTH/STATION pushbutton for hour start time.	Digital Display indicates hour selected.

NOTE: P1 AND P2 WILL NOT WATER AT THE SAME TIME; P1 WILL TAKE PRECEDENCE.

3	Press MIN/DAY/DAY NO. pushbutton for desired minutes (optional).	Digital Display shows minutes. Stop at selected time.
4	Repeat steps 2 and 3 for start times B, C, and D (optional).	
5	Set function selector switch back to AUTO.	Current time displayed.

NOTE: ANY TIME A CONTROLLER PUSHBUTTON IS HELD FOR MORE THAN 10 SECONDS, THE DISPLAY RATE WILL BE FASTER.

C. SEMI-AUTOMATIC OPERATION

Semi-Automatic may be started only when there is no program in operation. Semi-Automatic is used primarily when additional watering is desired without reprogramming. Semi-Automatic will water all stations beginning with first station selected with INDEX button. Station duration may be either in P1 and P2.

Set Selector Switch

STEP	PROCEDURE	INDICATION
1	Set function selector switch to AUTO.	Current time appears in Digital Display.
2	Set program selector switch for P1 or P2.	P1 or P2, only selected program will water.
3	Press START/INDEX pushbutton until desired station number for beginning semi-automatic operation appears on display.	Station number and duration in minutes appear in Digital Display.

D. MANUAL OPERATION

Manual Operation allows for selecting a single station for watering. Station duration may be either in P1 or P2.

STEP	PROCEDURE	INDICATION
1	Set function selector switch to DURATION.	Station number and watering duration time.
2	Set program selector switch for P1 or P2.	P1 or P2, only selected program will water.
3	Select watering, station by pressing HOURS/MONTH/STATION pushbutton until desired station appears.	Digital Display indicates station selected and water duration time.
4	Press START INDEX pushbutton.	Digital Display indicates station Selected and water duration time.
5	Return function selector switch to AUTO.	Digital Display indicates station selected and water duration time.

NOTE: IF DIGITAL DISPLAY DOES NOT SHOW BOTH STATION AND TIME SELECTED WHEN FUNCTION SELECTOR SWITCH IS RETURNED TO AUTO, REPEAT MANUAL OPERATION PROCEDURE. WHEN MANUAL WATER CYCLE IS COMPLETED, CONTROLLER WILL SHUT OFF SYSTEM UNTIL TIME FOR NEXT SCHEDULE. TO STOP MANUAL OPERATION PRESS CLEAR/STOP PUSHBUTTON ONCE.

NOTE: ANY TIME A CONTROLLER PUSHBUTTON IS HELD FOR MORE THAN 10 SECONDS, THE DISPLAY RATE WILL BE FASTER.

PROGRAMMING HINTS

1. Example of ODD DAY water cycle:

Today's date is June 15 (6-15).
The day is Wednesday (Day #4).

1	2	3	4	5	6	7
OFF	ON	OFF	ON	OFF	ON	OFF
SUN	MON	TUE	WED	THU	FRI	SAT

2. Example of ODD DAY water cycle:

Today's date is June 15 (6-15).
The day is Thursday (Day #5).

1	2	3	4	5	6	7
ON	OFF	ON	OFF	ON	OFF	ON
SUN	MON	TUE	WED	THU	FRI	SAT

3. Example of EVEN DAY water cycle:

Today's date is July 4 (7-4).
The day is Thursday (Day #5).

1	2	3	4	5	6	7
ON	OFF	ON	OFF	ON	OFF	ON
SUN	MON	TUE	WED	THU	FRI	SAT

4. Example of every THIRD DAY water cycle:

Today is June 15 (6-15).
The day is Sunday (Day #1).

1	2	3	4	5	6	7
ON	OFF	OFF	ON	OFF	OFF	ON
SUN	MON	TUE	WED	THU	FRI	SAT

NOTE: SATURDAY IS TURNED ON WHEN SUNDAY IS TURNED ON. (THIS IS THE FIRST DAY OF THE NEXT SIX-DAY PERIOD.)

5. Programming P1 and P2.

The last six positions on the function selector switch are used to program P1 or P2. The calendar, station duration, and start times can be set at the same time.

Example:

Set days to water on the calendar with program selector switch in P1. Then move program selector switch to P2 and program the P2 calendar. Computer will accept program in any order of entry.

6. Controller will not accept invalid data (i.e., April 31, Feb. 29).

7. Controller must be reprogrammed on March 1 during a leap year. Procedure: Turn Selector Knob to "DATE." Reset month and day.

WARNING

IF THE SPRINKLER CONTROLLER IS USED TO CONTROL A PUMP OR PUMPING SYSTEM AND ALL AVAILABLE STATIONS ARE NOT USED, THE OPTIONAL WEATHERMATIC CIRCUIT DELETE KIT #953 MUST BE USED. ALL UNUSED STATION WIRES MUST BE HOOKED TO THE CIRCUIT DELETE OPTION. HOOKUP INSTRUCTIONS WILL BE INCLUDED WITH THIS OPTION.

PROBLEMS

A. TROUBLESHOOTING

Below is the Mark Six and Mark Eight troubleshooting chart to use in the event of a system default indication and matching it with the corrective action to be taken.

MARK SERIES CONTROLLERS TROUBLESHOOTING CHART

FAULT INDICATION	CORRECTIVE ACTION
Digital Display flashing	<p>Check for power failure by rotating function selector switch thru all positions, starting with AUTO and back to AUTO. Display will stop blinking. If program values displayed when selector switch was rotated are the back-up program, power has been off for an extended period of time. Reset automatic program by following instructions in Section IV, B of this booklet.</p> <p>If program values displayed when selector switch was rotated are correct, controller has either experienced a brief power outage or a shorted station exists.</p> <p>To check for shorted station, press START/INDEX pushbutton and call up each station on Digital Display. If controller skips a station and the next station is flashing, short exists on skipped station. If a station short is indicated, contact your Weathermatic Dealer for service.</p>
No display	Ensure FUNCTION/SELECTOR switch is in AUTO. Check power source. If power is OK, call Your local Weathermatic Dealer.
Controller indicates station is on but no watering occurs.	<ol style="list-style-type: none">1. Check VALVE POWER switch to ensure it is in the ON position.2. Place RAIN-STAT switch to OFF to override Rain-Stat. If Rain-Stat is not used or problem continues, call you local Weathermatic Dealer.
Nonconsistent watering days.	Check for proper position of 7 DAY/6DAY calendar switch.
Program failed to remain in controller during power outage of less than 60 minutes	Replace batteries in controller and re-program.