CHRONTROL®

L SERIES OPERATOR'S GUIDE

IMPORTANT SAFEGUARDS

Always follow basic safety precautions when operating electrical equipment. Please observe the following safeguards:

? Read and save all instructions.
? To avoid electrical shock, do not immerse timer in water or other liquids, and do not operate when wet.
? All equipment controlled by this timer must have wattage ratings within the capacity of this timer, as stated in the *SPECIFICATIONS AND INSTALLATION* instructions. Exceeding the rated capacity may result in overheating and damage.
? Do not use this timer where flammable gas or fumes exist.
? Do not use this timer to control equipment that is damaged or malfunctions.
? Extreme external interference can, in rare situations, cause random behavior of this device. Do not use this timer in applications where random ON or OFF signals are potentially hazardous.

READ AND SAVE THESE INSTRUCTIONS

FCC COMPLIANCE

This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instruction manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area may cause interference in which case the user at his own expense will be required to take whatever steps are necessary to correct the interference.

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INTRODUCTION

ChronTrol is an electronic, microprocessor-based timer capable of performing a wide range of power-switching operations.

ChronTrol can be programmed to perform simple or complex time control operations. It has a wide range of capabilities and can perform many diverse functions. To obtain maximum benefit from your ChronTrol timer, please read and familiarize yourself with the programming procedures and capabilities described in this manual.

ChronTrol is easy to set and operate and will, with proper care, provide years of accurate, reliable service.

ELECTRICAL START-UP

At initial electrical start-up or after any A/C power interruption the keyboard response beeper is disabled until your timer has locked into the specified line frequency time base. Time base lock-in may take up to 100 seconds.

OVERVIEW

Your ChronTrol Timer features 15 'Master Entries' and 60 Operational Programs.

Master Entries are the universal operating parameters for your timer. They are used to set such things as Time of Day, Month, Date, Year, Latitude, and so on. Once set, these entries rarely, if ever, need to be reset.

Operational Programs are assigned, in any combination or sequence, to individual circuits and are used to set the specific operational schedule for the equipment connected to the circuits.

Any or all Operational Programs can be assigned to any or all circuits.

We suggest that you set the relevant Master Entries first and then set your Operational Programs.

CHRONTROL'S INTEGRITY TEST

After you have installed and supplied your timer with A/C power, we suggest that you perform ChronTrol's automatic Integrity Test. This test is initiated by Master Entry #13. Your timer will either PASS or FAIL this test.

If the timer passes the test, you can safely assume that your timer's circuitry was not damaged during shipment and you can proceed with programming.

If the timer fails the test, a four-digit code identifying the nature of the failure will be displayed. Immediately notify the factory of the failure and the code displayed. DO NOT PROCEED WITH PROGRAMMING.

NOTE: ChronTrol's Integrity Test can be performed at any time, not just at the initial start-up. This test will not affect any programmed operations.

INTITIATE CHRONTROL'S INTEGRITY TEST AS FOLLOWS:

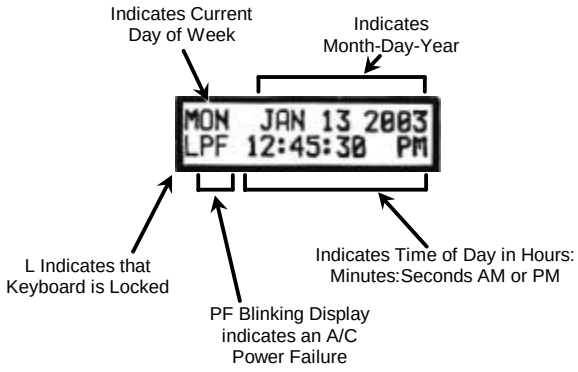
USER ACTION	DISPLAY DESCRIPTION
1. Press PROGRAM	
2. Press 0	
3. Press NEXT	MASTER ENTRY #? is displayed.
4. Press 13	MASTER ENTRY #? 13 is displayed.
5. Press NEXT	INTEGRITY TEST and a changing four-digit code are displayed. If the timer passes the test, PASSED is displayed and a single beep is heard. If the timer fails the test, FAILED and a four-digit code are displayed and five beeps are heard.

NOTE: The complete test takes approximately 35 seconds at Review Speed #1 (see **Adjusting the Review Speed** on page 12).

CHRONTROL'S 32 CHARACTER LCD DISPLAY

ChronTrol's display serves two functions. Ordinarily it displays the current Day of Week, Month, Day, Year, and Time of Day in hours, minutes, seconds, AM or PM.

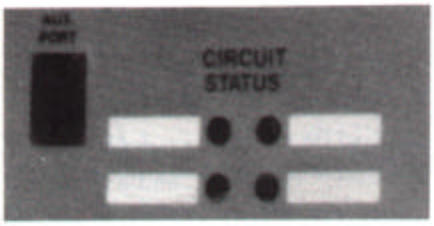
During programming, the display is used to guide (prompt) you through setting procedures, to visually confirm entries as they are made, and to review program settings.



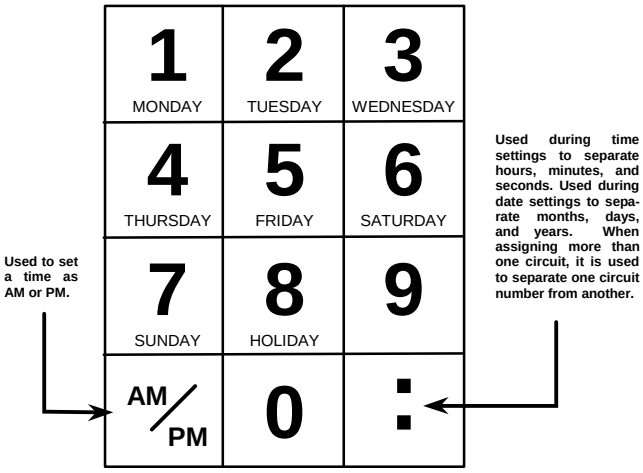
CIRCUIT STATUS INDICATORS

ChronTrol's clock panel includes one LED indicator for each available circuit. When illuminated, the LED indicates that a circuit is "ON".

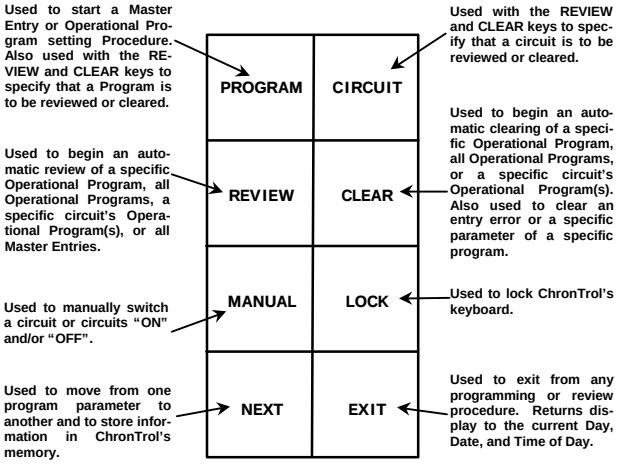
The white area next to each LED is used to identify the equipment assigned to that circuit.



20 KEY CONTROL PANEL NUMERIC KEYS



FUNCTION KEYS



LOCKING AND UNLOCKING YOUR CHRONTROL KEYBOARD

You may lock your ChronTrol keyboard to prevent unauthorized tampering or accidental entries.

When shipped from the factory, your ChronTrol timer has an unlocking code number of 0 1 0 3. However, you may set your own four digit unlocking code using Master Entry #5 (See Page 7).

LOCK THE CHRONTROL KEYBOARD AS FOLLOWS:

USER ACTION	DISPLAY DESCRIPTION
1. With the display in the Day-Date-Time of Day mode, press LOCK	KEYBOARD LOCKED and the Day-Date-Time of Day is displayed. An "L" is also displayed in the bottom left corner. The "L" indicates that the keyboard is locked.

UNLOCK YOUR CHRONTROL KEYBOARD. AS FOLLOWS:

USER ACTION	DISPLAY DESCRIPTION
1. Press 0 1 0 3 or your own four digit unlocking code	The Day and Date are displayed along with your four digit unlocking code. ***UNLOCKED*** and then ***CHRONTROL*** is displayed and the display returns to the current Day, Date, and Time of Day.

NOTE: If you enter the wrong four digit unlocking code, the display reads EXIT and shows the four numbers you pressed, and then returns to the current Day, Date, and Time of Day. The keyboard remains LOCKED.

If you do not complete the four-digit unlocking code entry in approximately 10 seconds, the display will read EXIT and return to the Day-Date-Time of Day mode. The keyboard remains LOCKED.

MANUAL CIRCUIT SWITCHING

You may manually switch any circuits "ON" and "OFF" through ChronTrol's keyboard without disturbing any program settings.

There are two ways you can use ChronTrol's manual feature. They are:

1. UNTIMED MANUAL OVERRIDE: When shipped from the factory, Master Entry #7 (Manuals Timer) has a setting of 00 hours, 00 minutes, 00 seconds. So, when you manually switch circuits ON or OFF, they will remain in the switched position and in memory until you manually switch them again, or until scheduled program events switch the circuits.
2. TIMED MANUAL OVERRIDE: Master Entry #7 allows you to set the length of time that circuits manually switched ON or OFF will STAY ON or OFF. See Page 8 for additional timed manual override information.

MANUALLY SWITCH CIRCUIT(S) ON AND/OR OFF AS FOLLOWS:

USER ACTION	DISPLAY DESCRIPTION
1. Press MANUAL	MANUAL CIR ON?
2. Press the numbers corresponding to the circuits you want to switch ON. Be sure to use the Colon [:] key to separate one circuit number from another when you enter more than one circuit number.	MANUAL CIR ON? and the numbers entered (if any)
3. Press NEXT	The circuits selected are turned ON and MANUAL CIR OFF? is displayed.
4. Press the numbers corresponding to the circuits you want to turn OFF. Be sure to use the Colon [:] key to separate one circuit number from another when you enter more than one circuit number.	MANUAL CIR OFF? and the numbers entered (if any)
5. Press NEXT	The circuits selected are turned OFF and the current Day, Date, and Time of Day is displayed.

CLEAR CIRCUITS THAT HAVE BEEN MANUALLY SWITCHED ON OR OFF AS FOLLOWS:

USER ACTION	DISPLAY DESCRIPTION
1. Press MANUAL	MANUAL CIR ON? and the circuit numbers switched ON.
2. Press CLEAR	MANUAL CIR ON?
3. Press the numbers of the circuits you want to stay ON	MANUAL CIR ON? and the numbers entered (if any)
4. Press NEXT	Only the circuits entered in step 3 remain manually ON. MANUAL CIR OFF? is displayed along with the circuit numbers switched OFF.
5. Press CLEAR	MANUAL CIR OFF?
6. Press the numbers of the circuits you want to stay OFF	MANUAL CIR OFF? and the numbers entered (if any)
7. Press NEXT	Only the circuits entered in step 6 remain manually OFF and the current Day, Date, and Time of Day is displayed.

TO REVIEW MANUAL CIRCUIT STATUS

You can automatically review the status of any circuits that have been manually switched ON or OFF.

The review will show circuits that are still ON or OFF as a result of manual switching with the keyboard. Circuits switched ON or OFF with the Bypass switches on the EMB Expander Module will NOT be indicated in this review.

REVIEW MANUAL AS FOLLOWS:

USER ACTION	DISPLAY DESCRIPTION
1. Press REVIEW	REVIEW BY?
2. Press MANUAL	MANUAL CIR ON and circuits ON by manual are displayed. Then MANUAL CIR OFF and circuits OFF by manual are displayed. The display then returns to the current Day, Date, and Time of Day.

MASTER ENTRIES

Your ChronTrol timer features 12 Master Entries plus 3 Special Master Entries that are used only with ChronTrol PRO60 PRINTER/PROGRAMMERS.

You may set any or all of the Master Entries depending on your specific application requirements. They are:

Master Entry #1	TIME OF DAY? sets the current Time of Day.
Master Entry #2	MON: DAY: YEAR? and DAY OF WEEK? used to set the current date and Day of Week.
Master Entry #3	DAYLIGHT SAVINGS ENABLED/ DISABLED used to turn ON or OFF the Daylight Saving Time option. The factory delivered setting is the Enabled position
Master Entry #4	HOLIDAY LIST? used to set the month and day of your holidays.
Master Entry #5	UNLOCK CODE? used to set your desired four-digit keyboard unlocking code. The factory delivered unlocking code is: 0 1 0 3.
Master Entry #6	CIRCUIT RESTART? used to set the rate at which circuits re-start after an A/C power interruption. The factory delivered circuit restart rate is 0.
Master Entry #7	MANUALS TIMER? is used to set the length of time that any circuit(s) manually switched ON or OFF will stay that way. The factory delivered setting is 00:00:00 (zero, no timed override).

Master Entry #8 LINE FREQUENCY? sets the line frequency time base at which you want your timer to operate. The factory delivered setting is 60Hz.

Master Entry #9 AUX BAUD RATE? was used to set the AUX. PORT's BAUD RATE as either 300 or 1200 BAUD. The factory delivered setting is 1200 BAUD, which cannot be changed.

Master Entry #13 INTEGRITY TEST is used to initiate ChronTrol's self-test program. See Page 3 for additional information.

Master Entry #14 NORTH LATITUDE is used to set your geographical location for computing sunrise or sunset . See Page 14 for additional information.

Master Entry #15 SELECTIVE REVIEW is used during the review of Operational Programs to exclude parameters that have no value set.

SPECIAL MASTER ENTRIES

Master Entry #10 STORE TO PRO60 is used only with a ChronTrol PRO60 PRINTER/ PROGRAMMER to transfer program information from your timer and store it in the PRO60's memory module.

Master Entry #11 LOAD TO TIMER is used only with a ChronTrol PRO60 PRINTER/ PROGRAMMER to transfer program information from the PRO60 into your timer.

Master Entry #12 AUTO REPORTING? is used only with a ChronTrol PRO60 PRINTER/ PROGRAMMER to obtain a printout of the Time, Day, and Date of each change in the status of circuits.

Each Master Entry is accessed in the following manner:

USER ACTION	DISPLAY DESCRIPTION
1. Press PROGRAM	PROGRAM NUMBER? and the next open program number
2. Press 0	PROGRAM NUMBER? 0
3. Press NEXT	MASTER ENTRY #?
4. Press the number of the Master Entry you want to set.	MASTER ENTRY #? and the selected number
5. Press NEXT	The MASTER ENTRY title is displayed, along with its current setting, if any

SETTING THE CURRENT TIME-OF-DAY

Master Entry #1 is used to set the current Time of Day. The Time of Day is the master reference point for each operational program.

Be sure to use the Colon [:] key to separate hours, minutes, and seconds.

SET THE CURRENT TIME-OF-DAY AS FOLLOWS:

USER ACTION	DISPLAY DESCRIPTION
1. Press PROGRAM	
2. Press 0	
3. Press NEXT	MASTER ENTRY #?
4. Press 1	MASTER ENTRY #? 1
5. Press NEXT	TIME OF DAY? and the current Time of Day clock setting
6. Press CLEAR	TIME OF DAY? 00:00:00 AM
7. Press the current Time of Day in hours [:] minutes [:] seconds, AM or PM	TIME OF DAY? and your setting
8. Press NEXT	The Time of Day is set and displayed along with the Day and Date.

SETTING THE CURRENT DATE AND DAY OF THE WEEK

Master Entry #2 is used to set the current date and day of week. The Day and Date are master reference points for all operational programs.

Be sure to use the Colon [:] key to separate the Month, Day, and Year.

SET THE CURRENT DATE AND DAY OF WEEK AS FOLLOWS:

USER ACTION	DISPLAY DESCRIPTION
1. Press PROGRAM	
2. Press 0	
3. Press NEXT	MASTER ENTRY #?
4. Press 2	MASTER ENTRY #? 2
5. Press NEXT	MON: DAY: YEAR? and the current date setting
6. Press the current date in month [:] day [:] and the last two digits of the year	MON: DAY: YEAR? and your setting
7. Press NEXT	DAY OF WEEK? and the current day of week

8. Press the current day of the week	DAY OF WEEK? and your setting
9. Press NEXT	The current Day and Date are set and displayed along with the Time of Day.

ENABLING AND DISABLING AUTOMATIC DAYLIGHT SAVING TIME

Master Entry #3 is used to Enable or Disable Daylight Saving Time. DST adjustment occurs automatically on the second Sunday in March and first Sunday in November. No changes to the factory setting are required unless there is a change in the law or you need to eliminate DST. For example, if you live in an area that does not participate in DST, you should disable the factory settings.

At 2:00 AM on the day DST begins, your ChronTrol timer will automatically advance the Time of Day to 3:00 AM. This adjustment occurs on the second Sunday in March.

At 2:00 AM on the day DST ends, your ChronTrol timer will automatically reset the Time of Day to 1:00 AM. This adjustment occurs on the first Sunday in November.

ENABLE OR DISABLE DAYLIGHT SAVING TIME AS FOLLOWS:

USER ACTION	DISPLAY DESCRIPTION
1. Press PROGRAM	
2. Press 0	
3. Press NEXT	MASTER ENTRY #?
4. Press 3	MASTER ENTRY #? 3
5. Press NEXT	DAYLIGHT SAVINGS ENABLED
6. Press AM/PM to switch between the Enabled and Disabled modes	DAYLIGHT SAVINGS DISABLED
7. Press NEXT	The selected mode of Daylight Saving Time is stored and the current Day, Date and Time of Day is displayed.

SETTING YOUR HOLIDAY LIST

Master Entry #4 is used to set your Holiday List. You may set up to 20 holidays. Each holiday can be a single day or an unlimited span of consecutive days (a linked holiday). Please note the different setting procedures for single versus linked holiday dates.

When setting single day holiday dates, the Colon [:] key is used to separate the Month and Day and to separate one holiday date from another.

When setting a **linked** holiday, the Colon key is also used to link the two dates, forming a holiday from the 1st date through the 2nd date.

After your Master Holiday List is set, each Operational Program's SKIP DAYS parameter is used to specify if holidays should be skipped or not.

SET THE HOLIDAY LIST AS FOLLOWS:

USER ACTION	DISPLAY DESCRIPTION
1. Press PROGRAM	
2. Press 0	
3. Press NEXT	MASTER ENTRY #?
4. Press 4	MASTER ENTRY #? 4
5. Press NEXT	HOLIDAY LIST? and the current setting, if any

SETTING SINGLE DAY HOLIDAYS

6. Press the Month [:] Day and [:] for each holiday date you want to enter.	HOLIDAY LIST? and each date pressed

SETTING LINKED HOLIDAYS

6. Press the Month [:] Day of the 1st date then press [:] [:] and the Month [:] and Day of the 2nd date followed by [:] for each linked holiday you want to enter.	HOLIDAY LIST? and each date pressed
7. Press NEXT	Your selected holiday dates are stored and the current Day, Date, and Time of Day is displayed.

EXAMPLE: Setting single day holidays of 4/15 and 6/15:

USER ACTION	DISPLAY DESCRIPTION
6. Press 4 [:] 15 [:] 6 [:] 15 and [:]	HOLIDAY LIST? 4/15 6/15

EXAMPLE: Setting a linked holiday from 12/24 through 1/2:

USER ACTION	DISPLAY DESCRIPTION
6. Press 12 [:] 24 [:] [:] 1 [:] 2 and [:]	HOLIDAY LIST? 12/24 – 1/2

SETTING YOUR FOUR DIGIT KEYBOARD UNLOCKING CODE

Master Entry #5 is used to set your own four-digit keyboard unlocking code. This code is used to unlock a locked keyboard and must be entered to complete a "Clear All Programs" procedure.

If you do not set your own unlocking code, a default code of 0 1 0 3 is in ChronTrol's memory.

SET YOUR FOUR DIGIT KEYBOARD UNLOCKING CODE AS FOLLOWS:

USER ACTION	DISPLAY DESCRIPTION
1. Press PROGRAM	
2. Press 0	
3. Press NEXT	MASTER ENTRY #?
4. Press 5	MASTER ENTRY #? 5
5. Press NEXT	UNLOCK CODE?
6. Press your desired four digit keyboard unlocking code	UNLOCK CODE? and your four digit code
7. Press NEXT	Your personal four-digit keyboard unlocking code is stored and the current Day, Date and Time of Day is displayed.

SETTING YOUR CIRCUIT RESTART RATE

Master Entry #6 is used to set the rate (in seconds) at which circuits scheduled to be ON will restart after an A/C power interruption. The restart begins with Circuit #1 and continues through Circuit #16, turning each circuit ON at the interval set by Master Entry #6.

Set your restart rate in seconds, 0 through 99.

The factory delivered setting is 0 (zero) seconds, which results in NO circuit restart spacing after an A/C power interruption. All circuits scheduled to be ON will come on simultaneously.

SET YOUR CIRCUIT RESTART RATE AS FOLLOWS:

USER ACTION	DISPLAY DESCRIPTION
1. Press PROGRAM	
2. Press 0	
3. Press NEXT	MASTER ENTRY #?
4. Press 6	MASTER ENTRY #? 6
5. Press NEXT	CIRCUIT RESTART?
6. Press your desired circuit restart rate in seconds from 0 to 99	CIRCUIT RESTART? and your rate in seconds
7. Press NEXT	Your Circuit Restart spacing rate is stored and the current Day, Date and Time of Day is displayed.

SETTING THE MANUALS TIMER

Master Entry #7 is used to set the length of time that any circuits manually switched ON or OFF will remain that way.

Set the Manuals Timer in hours (0-23), minutes (0-59), and seconds (0-59).

If Master Entry #7 has been set, then circuits manually switched ON or OFF will remain in the manually switched position for the length of time specified by Master Entry #7 regardless of any program schedule for the circuits involved.

The factory delivered setting is 00:00:00 - zero, no timed override.

Be sure to use the Colon [:] key to separate hours, minutes and seconds.

SET THE MANUALS TIMER AS FOLLOWS:

USER ACTION	DISPLAY DESCRIPTION
1. Press PROGRAM	
2. Press 0	
3. Press NEXT	MASTER ENTRY #?
4. Press 7	MASTER ENTRY #? 7
5. Press NEXT	MANUALS TIMER? 00:00:00
6. Press the length of time in hours [:] minutes [:] and seconds that you want manually switched circuits to stay ON and/or OFF.	MANUALS TIMER? and the length of time selected
7. Press NEXT	Your Manuals Timer is stored in memory, and the current Day, Date and Time of Day is displayed.

SETTING YOUR LINE FREQUENCY TIME BASE

Master Entry #8 is used to set your timer's line frequency time base.

Your timer is designed to run on either 60 or 50 Hz line frequency.

The factory delivered line frequency time base setting is 60 Hz.

SET YOUR LINE FREQUENCY TIME BASE AS FOLLOWS:

USER ACTION	DISPLAY DESCRIPTION
1. Press Program	
2. Press 0	
3. Press NEXT	MASTER ENTRY #?
4. Press 8	MASTER ENTRY #? 8
5. Press NEXT	LINE FREQUENCY? 60Hz

6.	Press your desired line frequency time base (either 50 or 60)	LINE FREQUENCY? and the desired frequency
7.	Press NEXT	Your selected line frequency time base is stored and the current Day, Date, and Time of Day is displayed.

THE AUX. PORT BAUD RATE

Master Entry #9 was used to set the AUX. PORT's Baud rate as either 300 or 1200 BAUD.

The factory delivered setting is 1200 BAUD. This setting cannot be changed.

SETTING YOUR NORTH LATITUDE

Master Entry #14 is used to set the north latitude in your area.

The latitude setting is required for the correct computation of sunrise and sunset. See page 14 for more information about sun-relative programming.

You can use Master Entry #14 to preview sunrise and sunset for ANY date, without changing the current date.

SET YOUR NORTH LATITUDE AS FOLLOWS:

	USER ACTION	DISPLAY DESCRIPTION
1.	Press Program	
2.	Press 0	
3.	Press NEXT	MASTER ENTRY #?
4.	Press 14	MASTER ENTRY #? 14
5.	Press NEXT	NORTH LATITUDE? 0
6.	Press your latitude in degrees (0 to 60)	NORTH LATITUDE? and the latitude
7.	Press NEXT	MON: DAY: YEAR? and the current date setting
8.	**Optional**: Press any date in month [:] day [:] and the last two digits of the year to preview sunrise and sunset	MON: DAY: YEAR? and your setting **NOTE**: this will not change the current date
9.	Press NEXT	SUNRISE and SUNSET for the selected date
10.	Press NEXT	Your selected north latitude is stored and the current Day, Date, and Time of Day is displayed.

SELECTIVE REVIEW

Master Entry #15 is used to enable and disable Selective Review.

Selective Review limits the amount of information displayed during review of an Operational Program, by leaving out unused parameters. This cuts down on unnecessary information and greatly reduces the amount of paper used by the PRO60 Printer/Programmer during review.

The factory delivered setting is Selective Review disabled.

ENABLE AND DISABLE SELECTIVE REVIEW AS FOLLOWS:

	USER ACTION	DISPLAY DESCRIPTION
1.	Press Program	
2.	Press 0	
3.	Press NEXT	MASTER ENTRY #?
4.	Press 15	MASTER ENTRY #? 15
5.	Press NEXT	SELECTIVE REVIEW DISABLED
6.	Press AM/PM to toggle between the Enabled and Disabled modes	SELECTIVE REVIEW ENABLED
7.	Press NEXT	The current status of Selective Review is stored and the current Day, Date and Time of Day is displayed.

TO REVIEW ALL MASTER ENTRIES

You may automatically review all Master Entry settings (except the unlocking code, Master Entry #5).

REVIEW ALL MASTER ENTRIES AS FOLLOWS:

	USER ACTION	DISPLAY DECRIPTION
1.	Press REVIEW	REVIEW BY?
2.	Press PROGRAM	PROGRAM NUMBER?
3.	Press 0	PROGRAM NUMBER 0
4.	Press NEXT	MASTER ENTRY # and then starting with Master Entry #1, Time of Day, all Master Entry titles and their settings are displayed (except your unlocking code). When the review is completed, the display returns to the current Day, Date, and Time of Day.

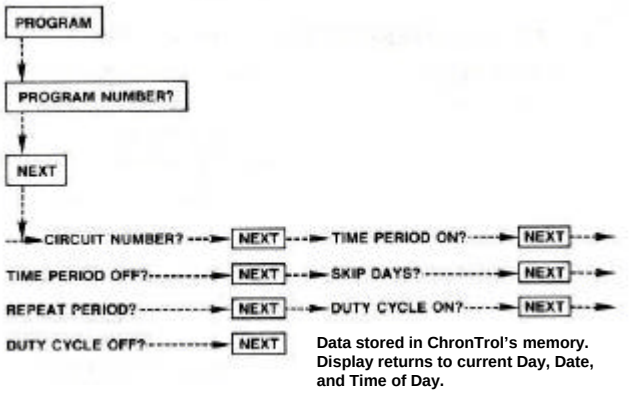
OPERATIONAL PROGRAMS

As many as 60 individual operational programs can be stored in ChronTrol's memory.

Each program is set, modified, reviewed or cleared through ChronTrol's 20-key control panel.

Each program consists of a sequence of seven operational parameters or questions. The NEXT key is used to move from one parameter to another and to store operational information in ChronTrol's memory (see Diagram #1). You can set any or all of the parameters, depending on your specific application requirements. A brief discussion of each parameter follows the diagram.

DIAGRAM #1



PROGRAM NUMBER?

When you press the PROGRAM key, ChronTrol automatically displays the next open program number. You may use that program number or you may select another number.

CIRCUIT NUMBERS?

CIRCUIT NUMBERS is used to specify which circuit or circuits you want a specific program to control. Be sure to use the Colon [:] key to separate circuit numbers when entering more than one circuit.

TURN-ON TIME?
00:00:00 AM

TURN-ON TIME is used to set the time at which a circuit(s) switches ON. It is set in hours, minutes and seconds, AM or PM. Be sure to use the Colon key to separate hours, minutes, and seconds. See Page 15 Diagram #3 for additional TURN-ON TIME information.

TURN-OFF TIME?
00:00:00 AM

TURN-OFF TIME is used to set the time at which a circuit(s) switches OFF. It is set in hours, minutes, and seconds, AM or PM. Be sure to use the Colon key to separate hours, minutes and seconds. See Page 15 Diagram #3 for additional TURN-OFF TIME information.

SKIP DAYS?

SKIP DAYS is used to specify the day or days you DO NOT want a program to occur. SKIP DAYS is set by days of the week (1-7) and Holidays (8th day). Holidays are the day(s) set by Master Entry #4 (Holiday List). Remember, a Day is a 24-hour period from MIDNIGHT to 11:59:59 PM.

CYCLE RATE?
00:00:00

CYCLE RATE is used to specify the rate at which a program's TURN-ON and TURN-OFF times reoccur. If you want a program's TURN-ON and TURN-OFF times to reoccur every 24 hours, no setting of the CYCLE RATE parameter is necessary. It is set in hours (0-99), minutes (0-59), and seconds (0-59). Be sure to use the Colon key to separate hours, minutes and seconds. See Page 15 Diagram #4 for additional CYCLE RATE information.

DUTY CYCLE ON?
00:00:00

DUTY CYCLE ON is used in conjunction with a program's TURN-ON and TURN-OFF times to specify the length of time a circuit(s) "Duty Cycles ON". DUTY CYCLE ON will occur only within the operating time window established by a program's TURN-ON and TURN-OFF times. This parameter is set in hours (0-23), minutes (0-59), and seconds (0-59). Be sure to use the Colon key to separate hours, minutes, and seconds. See Page 15 Diagram #5 for additional DUTY CYCLE ON information.

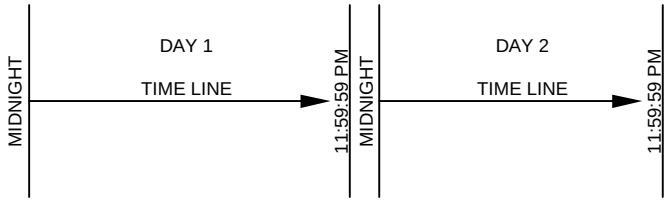
DUTY CYCLE OFF?
00:00:00

DUTY CYCLE OFF is used in conjunction with a program's TURN-ON, TURN-OFF and DUTY CYCLE ON times to specify the length of time a circuit(s) "Duty Cycles OFF". DUTY CYLE OFF will only occur within the operating time window established by the program's TURN-ON and TURN-OFF times. This parameter is set in hours (0-23), minutes (0-59), and seconds (0-59). Be sure to use the Colon key to separate hours, minutes, and seconds. See Page 15 Diagram #5 for additional DUTY CYCLE OFF information.

SETTING CONSIDERATIONS

DAYS BEGIN AT MIDNIGHT (12:00:00 AM) AND END AT 11:59:59 PM. This is very important to keep in mind when setting ChronTrol programs, especially those programs using SKIP A DAY. See Diagram #2.

DIAGRAM #2



Programs whose operations overlap midnight and have SKIP A DAY settings may require special consideration. See page 20 for a sample program involving a midnight overlap schedule that runs from one day into another and uses Skip a Day.

10 VALID PROGRAM PARAMETER COMBINATIONS

1. ON ONLY
2. OFF ONLY
3. ON ONLY WITH CYCLE
4. OFF ONLY WITH CYCLE
5. ON ONLY WITH DUTY CYCLE ON, AND DUTY CYCLE OFF
6. ON ONLY WITH CYCLE, DUTY CYCLE ON, AND DUTY CYCLE OFF
7. ON AND OFF
8. ON AND OFF WITH CYCLE
9. ON AND OFF WITH DUTY CYCLE ON, AND DUTY CYCLE OFF
10. ON AND OFF WITH CYCLE, DUTY CYCLE ON, AND DUTY CYCLE OFF

NOTE: SKIP DAYS MAY BE USED WITH ANY OF THE 10 VALID PROGRAM PARAMETER COMBINATIONS.

SET AN OPERATIONAL PROGRAM AS FOLLOWS:

USER ACTION	DISPLAY DESCRIPTION
1. Press PROGRAM	PROGRAM NUMBER? and the next open program number
2. Press NEXT	CIRCUIT NUMBERS?
3. Press the circuit number or numbers that you want this program to control. Be sure to use the Colon [:] key when entering more than one circuit number.	CIRCUIT NUMBERS? and the circuit number or numbers selected
4. Press NEXT	TURN-ON TIME? 00:00:00 AM
5. Press the time, in hours [:] minutes [:] and seconds, AM or PM, at which you want this program to turn the selected circuit(s) ON.	TURN-ON TIME? and the selected time
6. Press NEXT	TURN-OFF TIME? 00:00:00 AM
7. Press the time, in hours [:] minutes [:] and seconds, AM or PM, at which you want this program to turn the selected circuit(s) OFF.	TURN-OFF TIME? and the selected time
8. Press NEXT	SKIP DAYS?
9. Press the day or days that you DO NOT want this program to operate.	SKIP DAYS? and the selected day(s)
10. Press NEXT	CYCLE RATE? 00:00:00
11. Press the rate, in hours [:] minutes [:] and seconds, at which you want this program's TURN-ON and TURN-OFF times to reoccur.	CYCLE RATE? and the selected rate
12. Press NEXT	DUTY CYCLE ON? 00:00:00
13. Press the length of time in hours [:] minutes [:] and seconds, that you want this program's selected circuit(s) to "DUTY CYCLE ON".	DUTY CYCLE ON? and the selected length of time
14. Press NEXT	DUTY CYCLE OFF? 00:00:00
15. Press the length of time in hours [:] minutes [:] and seconds, that you want this program's selected circuit(s) to "DUTY CYCLE OFF".	DUTY CYCLE OFF? and the selected length of time
16. Press NEXT	PROGRAM __ SAVED is displayed and the display returns to the current Day, Date and Time of Day.

CHRONTROL'S AUTOMATIC REVIEW

ChronTrol's review feature allows you to review the contents of your timer's memory automatically. There are five automatic review modes. They are:

1. Review of a Specific Operational Program
2. Review of All Operational Programs
3. Review of a Specific Circuit's Operational Program(s)
4. Review of All "Master Entries" (See Page 9)
5. Review of Circuits Manually Switched (See Page 5)

Stopping A Review

You may stop a review at any point by pushing the NEXT key. To resume the review, push the NEXT key again.

Adjusting the Review Speed

During a review, you can adjust the speed at which the review occurs by pushing the numeric keys 0 through 9. 9 is the slowest review speed, 8 is the next slowest, and so on with 0 (zero) being the fastest review speed possible. The factory delivered review speed is 5.

Terminating A Review

You can terminate a review at any point by pushing the EXIT key. When EXIT is pushed the review ends and the display returns to the current Day, Date, and Time of Day.

TO REVIEW A SPECIFIC CIRCUIT'S OPERATIONAL PROGRAM(S)

USER ACTION	DISPLAY DESCRIPTION
1. Press REVIEW	REVIEW BY?
2. Press CIRCUIT	CIRCUIT NUMBER?
3. Press the circuit number you want to review	CIRCUIT NUMBER? and the selected circuit number
4. Press NEXT	The review begins, listing all programs involving the selected circuit number. When the review is completed, the display returns to the current Day, Date, and Time of Day.

TO REVIEW A SPECIFIC OPERATIONAL PROGRAM

USER ACTION	DISPLAY DESCRIPTION
1. Press REVIEW	REVIEW BY?
2. Press PROGRAM	PROGRAM NUMBER?
3. Press the number of the program you want to review	PROGRAM NUMBER? and the selected number
4. Press NEXT	The review begins. All information relevant to the selected program number is displayed. When the review is completed, the display returns to the current Day, Date, and Time of Day.

TO REVIEW ALL OPERATIONAL PROGRAMS

USER ACTION	DISPLAY DESCRIPTION
1. Press REVIEW	REVIEW BY?
2. Press PROGRAM	PROGRAM NUMBER?
3. Press 99	PROGRAM NUMBER? 99
4. Press NEXT	REVIEW ALL is displayed, and in succession, beginning with Program #1, all set programs are displayed. When the review is completed, the display returns to the current Day, Date, and Time of Day.

CHRONTROL'S AUTOMATIC CLEARING

ChronTrol's CLEAR feature allows you to clear the contents of your timer's operational memory automatically. There are three ways to clear operational information. They are:

1. Clear a Specific Operational Program
2. Clear All Operational Programs
3. Clear a Specific Circuit's Operational Program(s)

NOTE: After you use any of the 3 clearing procedures, the circuits affected are returned to the OFF (NC) condition.

TO CLEAR A SPECIFIC CIRCUIT'S OPERATIONAL PROGRAM(S)

USER ACTION	DISPLAY DESCRIPTION
1. Press CLEAR	CLEAR BY?
2. Press CIRCUIT	CIRCUIT NUMBERS?
3. Press the circuit number you want to clear	CIRCUIT NUMBERS? and the selected circuit number
4. Press NEXT	All programs that have only the selected circuit number assigned to them are completely cleared. Any programs that have more than one circuit number assigned to them clear only the selected circuit number from their programs. The current Day, Date, and Time of Day is then displayed.

TO CLEAR A SPECIFIC OPERATIONAL PROGRAM

USER ACTION	DISPLAY DESCRIPTION
1. Press CLEAR	CLEAR BY?
2. Press PROGRAM	PROGRAM NUMBER?
3. Press the program number you want to clear	PROGRAM NUMBER? and the selected program number
4. Press NEXT	The selected program number is cleared and the current Day, Date, and Time of Day is displayed.

TO CLEAR ALL OPERATIONAL PROGRAMS

USER ACTION	DISPLAY DESCRIPTION
1. Press CLEAR	CLEAR BY?
2. Press PROGRAM	PROGRAM NUMBER?
3. Press 99	PROGRAM NUMBER? 99
4. Press NEXT	UNLOCK CODE?
5. Press your four digit keyboard unlocking code	UNLOCK CODE? and your code number is briefly displayed. All operational programs are then cleared and the current Day, Date, and Time of Day is displayed.

ERROR CHECKING MESSAGES

Your ChronTrol timer features error checking, making entry errors virtually impossible. If you make a mistake, your timer will catch it and tell you what you did wrong.

You can "EXIT" from any error message and start over OR you can correct the error and continue programming.

A description of all possible error messages and the reasons for them follows:

TIME ERROR MESSAGES	REASON FOR MESSAGE
1. INVALID TIME	An invalid time was input for a Time-of Day, Turn-On Time, Turn-Off Time, Cycle Rate, or Duty Cycle.
2. TIME ERROR (ON CANNOT=OFF)	A program's Turn-On and Turn-Off times are the same, or no Turn-On or Turn-Off times were set.
3. CYCLE RATE ERROR (MUST BE GREATER THAN ON/OFF)	A Cycle Rate was attempted which was less than the time between the program's Turn-On and Turn-Off times.
4. DUTY CYCLE ERROR (MUST HAVE BOTH)	A Duty Cycle ON was attempted without a Duty Cycle OFF or a Duty Cycle OFF was set without a Duty Cycle ON.

DATE ERROR MESSAGES	REASON FOR MESSAGES
1. INVALID DATE	An invalid month and/or day was attempted for a current Date or a Holiday List Date.
2. NOT A LEAP YEAR	A current Date of February 29 was attempted for a non-leap year.

PROGRAM NUMBER ERROR MESSAGE	REASON FOR MESSAGE
1. INVALID PROGRAM #	A program number other than 0-60 or 99 was attempted.

CIRCUIT NUMBER ERROR MESSAGE	REASON FOR MESSAGE
1. INVALID CIRCUIT #	A circuit number other than 1-16 was attempted.

MASTER ENTRY NUMBER ERROR MESSAGE	REASON FOR MESSAGE
1. INVALID MASTER #	A Master Entry Number other than 1-15 was attempted.

REVIEW ERROR MESSAGE	REASON FOR MESSAGE
1. PROGRAM OPEN	A review of an unused program number was attempted.
2. CKT NOT FOUND	A review of an unused circuit number was attempted.

CLEAR ERROR MESSAGES	REASON FOR MESSAGE
1. PROGRAM OPEN	An attempt was made to clear an open program number.
2. CKT NOT FOUND	An attempt was made to clear an unused circuit number.
3. CANNOT BE PROG 0	You cannot automatically clear all Master Entries.

MEMORY FULL MESSAGES	REASON FOR MESSAGE
1. PROGRAMS FULL!	All (sixty) operational programs are set.
2. HOLIDAYS FULL!	All (20) Holiday Dates are set.

POWER FAILURE BATTERY BACK-UP SYSTEM

Your ChronTrol timer features a battery back-up power supply system, which is used when A/C power is interrupted to run the Time-of-Day clock and to maintain and update all operational programs.

After an A/C power failure, ChronTrol's display blinks, PF (Power Failure) is shown in the bottom left corner and the time of the last power failure is displayed.

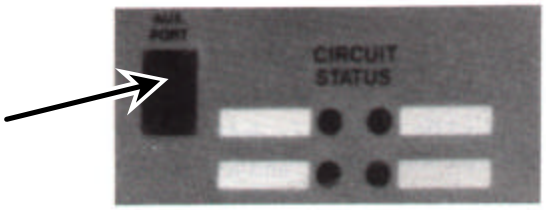
The display remains in this condition until any one of the 20 control panel keys is pushed.

When any key is pushed, the display stops blinking, shows CUMULATIVE PF:, and the cumulative length of time that A/C power was out is displayed in days, hours, minutes and seconds (0D 00H 00M 00S). The cumulative power outage time is displayed until the EXIT Key is pressed. After the EXIT Key is pressed, the display automatically returns to the current Day, Date, and Time of Day and resets the cumulative power outage memory to zero.

When A/C power is restored, all program events that should have occurred are accounted for and circuits are switched to their proper positions for the current Day, Date, and Time of Day.

The battery back-up system is automatically tested every second for proper voltage. When low battery voltage is detected, REPLACE BATTERY! is displayed until the batteries are changed, retested, and found sufficient.

AUXILIARY PORT INFORMATION



The auxiliary port (AUX. PORT) is a serial communication link to the outside world. The port is located in the upper left side of the clock panel and is designed for use with a ChronTrol PRO60 PRINTER/PROGRAMMER or T50 telephone receiving modem.

A ChronTrol PRO60 PRINTER/PROGRAMMER can be plugged into any timer's AUX. PORT, allowing the user to obtain a "hard copy" printout of any timer's memory and to load program information into any timer's memory automatically.

FOR ADDITIONAL INFORMATION ABOUT THE CHRONTROL PRO60, ASK FOR "CHRONTROL PRO60 PRINTER/PROGRAMMER OPERATOR'S GUIDE".

PROGRAMMING FOR SUNRISE AND SUNSET

Any of ChronTrol's 60 operational programs can be set to turn on or off at sunrise or sunset. A single sun-relative program can perform any of the following six actions:

1. On at sunrise.
2. On at sunset.
3. Off at sunrise.
4. Off at sunset.
5. On at sunrise and Off at a fixed time.
6. On at sunset and Off at a fixed time.

Two programs are required for all other combinations. "On at sunset and Off at sunrise" requires one program for sunset (type 2 above) and a separate program for sunrise (type 3 above).

You must choose either the Turn-On time or the Turn-Off time to be sun-relative, and you must choose whether it is relative to sunrise or sunset. Your choice is indicated by three settings:

A. SET THE LATITUDE FOR YOUR AREA

Refer to Master Entry #14 on page 9.

B. SELECT TURN-ON OR TURN-OFF

1. If the **Turn-On** time is to occur relative to sunrise or sunset (types 1 and 2), put any non-zero time in the Turn-On time and leave the Turn-Off time zero.
2. If the **Turn-Off** time is to occur relative to sunrise or sunset (types 3 and 4), put any non-zero time in the Turn-Off time and leave the Turn-On time zero.
3. If the **Turn-On** time is to occur relative to sunrise or sunset and the **Turn-Off** time is to occur at a **fixed** time (types 5 and 6), enter any non-zero time into the Turn-On time and the desired fixed time into the Turn-Off time.

C. SELECT SUNRISE OR SUNSET

1. When "CYCLE RATE?" appears in the programming sequence, press AM/PM to apply **sunrise**-relative adjustment to the time you selected. Press AM/PM again to apply **sunset**-relative adjustment.
2. NOTE: You can add or subtract a fixed offset from actual sunrise/sunset to correct for lighting conditions in your area. To offset the Turn-On or Turn-Off time from sunrise or sunset, enter a time difference into the "cycle" time (00:01:00 will occur 1 minute after, while 23:59:00 will occur 1 minute before).

Now, the ChronTrol will plug the correct value for sunrise or sunset into the Turn-On or Turn-Off time, whichever is not zero. If both Turn-On and Turn-Off are not zero, Turn-On will be chosen.

The sample programs on page 18 illustrate the use of these features.

APPENDIX A - PROGRAM TIME LINES

DIAGRAM #3

Assume that PROGRAM NUMBER 1 was assigned to CIRCUITS 1, 3, and 4, and that its TURN-ON TIME was 6:00 AM and its TURN-OFF TIME was 6:00 PM.

PROGRAM NUMBER	= 1
CIRCUIT NUMBERS	= 1:3:4
TURN-ON TIME	= 06:00:00 AM
TURN-OFF TIME	= 06:00:00 PM
SKIP DAYS	= NONE
CYCLE RATE	= 00:00:00 (24 HRS if NONE is specified)
DUTY CYCLE ON	= 00:00:00 (NONE)
DUTY CYCLE OFF	= 00:00:00 (NONE)

This program would switch circuits 1, 3, and 4 ON from 6:00 AM to 6:00 PM. Since NO SKIP DAYS were set, this program would run every day.

The shaded area indicates the time during which circuits 1, 3, and 4 would be ON.

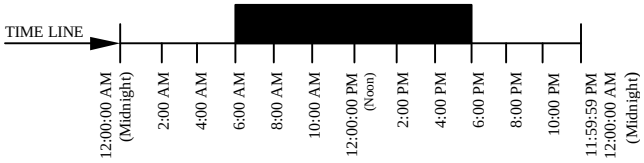


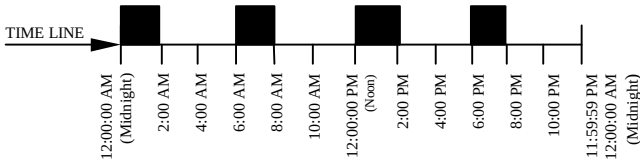
DIAGRAM #4

Assume that PROGRAM NUMBER 2 was assigned to CIRCUIT #2, and that its TURN-ON TIME was 6:00 AM, its TURN-OFF TIME was 8:00 AM, and its CYCLE RATE was 6 hours.

PROGRAM NUMBER	= 2
CIRCUIT NUMBER	= 2
TURN-ON TIME	= 06:00:00 AM
TURN-OFF TIME	= 08:00:00 AM
SKIP DAYS	= NONE
CYCLE RATE	= 06:00:00
DUTY CYCLE ON	= 00:00:00 (NONE)
DUTY CYCLE OFF	= 00:00:00 (NONE)

This program would switch circuit #2 ON for 2 hours every 6 hours, starting at 6:00 AM. Since NO SKIP DAYS were set, this program would repeat daily.

The shaded areas indicate the times during which circuit #2 would be ON.



NOTE: On the second and following days Circuit #2 would also be ON from 12:00 AM (MIDNIGHT) to 2:00 AM.

DIAGRAM #5

Assume that PROGRAM NUMBER 3 was assigned to CIRCUIT NUMBERS 6, 10, and 13, and that its TURN-ON TIME was 6:00 AM, its TURN-OFF TIME was 6:00 PM, its DUTY CYCLE ON rate was 1 hour and its DUTY CYCLE OFF rate was 1 hour.

PROGRAM NUMBER	= 3
CIRCUIT NUMBERS	= 6:10:13
TURN-ON TIME	= 06:00:00 AM
TURN-OFF TIME	= 06:00:00 PM
SKIP DAYS	= NONE
CYCLE RATE	= 00:00:00 (NONE)
DUTY CYCLE ON	= 01:00:00
DUTY CYCLE OFF	= 01:00:00

This program would switch circuits 6, 10, and 13 ON for 1 hour, and OFF for 1 hour, but only from 6:00 AM to 6:00 PM.

The shaded areas indicate the times during which circuits 6, 10, and 13 would be ON.

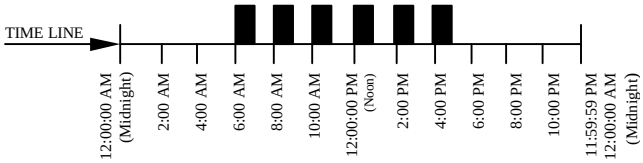


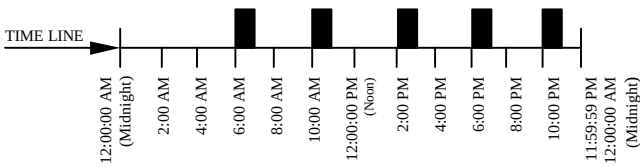
DIAGRAM #6

Assume that PROGRAM NUMBER 4 was assigned to CIRCUIT NUMBER 5 and that its TURN-ON TIME was 6:00 AM, its TURN-OFF TIME was 8:00 AM, its CYCLE RATE was 4 hours, its DUTY CYCLE ON rate was 1 hour, and that its DUTY CYCLE OFF rate was 1 hour.

PROGRAM NUMBER	= 4
CIRCUIT NUMBER	= 5
TURN-ON TIME	= 06:00:00 AM
TURN-OFF TIME	= 08:00:00 AM
SKIP DAYS	= NONE
CYCLE RATE	= 04:00:00
DUTY CYCLE ON	= 01:00:00
DUTY CYCLE OFF	= 01:00:00

This program would switch circuit number 5 ON for 1 hour, and OFF for 1 hour every 4 hours, starting at 6:00 AM.

The shaded areas indicate the times during which circuit number 5 would be ON.



NOTE: On the second and following days Circuit #5 would also be ON from 2:00 AM to 3:00 AM.

APPENDIX B - SAMPLE PROGRAMS

ON ONLY PROGRAM

DESIRED EFFECT: To turn Circuit #1 ON at 10:00 AM.

PROGRAM PARAMETERS USED:

CIRCUIT NUMBER = 1

TURN-ON TIME = 10:00:00 AM

TIME WHEN PROGRAM IS SET: 12:00:00 PM (Noon)

This program is used to turn a circuit on and to leave it on until another program causes a change in circuit status.

USER ACTION	DISPLAY DESCRIPTION
1. Press PROGRAM	PROGRAM NUMBER? and the next open program number
2. Press NEXT	CIRCUIT NUMBERS?
3. Press 1	CIRCUIT NUMBERS? 1
4. Press NEXT	TURN-ON TIME? 00:00:00 AM
5. Press 1, 0	TURN-ON TIME? 10:00:00 AM
6. Press NEXT	TURN-OFF TIME? 00:00:00 AM
7. Press NEXT	SKIP DAYS?
8. Press NEXT	CYCLE RATE? 00:00:00
9. Press NEXT	DUTY CYCLE ON? 00:00:00
10. Press NEXT	DUTY CYCLE OFF? 00:00:00
11. Press NEXT	PROGRAM __ SAVED is displayed, Circuit #1 is ON, and the display returns to the current Day, Date and Time of Day.

ON AND OFF PROGRAM WITH SKIP DAYS

DESIRED EFFECT: To turn Circuit #3 ON from 6:00 AM to 4:30 PM, Monday through Saturday, skipping its operation on Sundays and Holidays.

PROGRAM PARAMETERS USED:

CIRCUIT NUMBER = 3

TURN-ON TIME = 06:00:00 AM

TURN-OFF TIME = 04:30:00 PM

SKIP DAYS = Sunday, Holiday

TIME WHEN PROGRAM IS SET: 3:00 PM WEDNESDAY (Not a holiday)

USER ACTION	DISPLAY DESCRIPTION
1. Press PROGRAM	PROGRAM NUMBER? and the next open program number is displayed.
2. Press NEXT	CIRCUIT NUMBERS?
3. Press 3	CIRCUIT NUMBERS? 3
4. Press NEXT	TURN-ON TIME? 00:00:00 AM
5. Press 6	TURN-ON TIME? 06:00:00 AM
6. Press NEXT	TURN-OFF TIME? 00:00:00 AM
7. Press 4 : 30 PM	TURN-OFF TIME? 04:30:00 PM
8. Press NEXT	SKIP DAYS?
9. Press SUNDAY, HOLIDAY	SKIP DAYS? SUN HOL
10. Press NEXT	CYCLE RATE? 00:00:00
11. Press NEXT	DUTY CYCLE ON? 00:00:00
12. Press NEXT	DUTY CYCLE OFF? 00:00:00
13. Press NEXT	PROGRAM __ SAVED is displayed, Circuit #3 is ON, and the display returns to the current Day, Date, and Time of Day.

ON AND OFF PROGRAM WITH CYCLE

DESIRED EFFECT: To turn Circuit #4 ON for 1 minute every 9 hours, beginning at 8:00 AM.

PROGRAM PARAMETERS USED:

CIRCUIT NUMBER	= 4
TURN-ON TIME	= 8:00:00 AM
TURN-OFF TIME	= 8:01:00 AM
CYCLE RATE	= 9:00:00

TIME WHEN PROGRAM IS SET: 10:30 AM.

USER ACTION	DISPLAY DESCRIPTION
1. Press PROGRAM	PROGRAM NUMBER? and the next open program number is displayed.
2. Press NEXT	CIRCUIT NUMBERS?
3. Press 4	CIRCUIT NUMBERS? 4
4. Press NEXT	TURN-ON TIME? 00:00:00 AM
5. Press 8	TURN-ON TIME? 08:00:00 AM
6. Press NEXT	TURN-OFF TIME? 00:00:00 AM
7. Press 8 : 1	TURN-OFF TIME? 08:01:00 AM
8. Press NEXT	SKIP DAYS?
9. Press NEXT	CYCLE RATE? 00:00:00
10. Press 9	CYCLE RATE? 09:00:00
11. Press NEXT	DUTY CYCLE ON? 00:00:00
12. Press NEXT	DUTY CYCLE OFF? 00:00:00
13. Press NEXT	PROGRAM __ SAVED is displayed, and the display returns to the current Day, Date, and Time of Day.

ON AND OFF PROGRAM WITH DUTY CYCLE ON AND OFF

DESIRED EFFECT: To turn Circuit #1 ON for 25 minutes and off for 5 minutes from 6:30 AM to 5:30 PM.

PROGRAM PARAMETERS USED:

CIRCUIT NUMBER	= 1
TURN-ON TIME	= 6:30:00 AM
TURN-OFF TIME	= 5:30:00 PM
DUTY CYCLE ON	= 00:25:00
DUTY CYCLE OFF	= 00:05:00

TIME WHEN PROGRAM IS SET: 11:00 AM.

USER ACTION	DISPLAY DESCRIPTION
1. Press PROGRAM	PROGRAM NUMBER? and the next open program number is displayed.
2. Press NEXT	CIRCUIT NUMBERS?
3. Press 1	CIRCUIT NUMBERS? 1
4. Press NEXT	TURN-ON TIME? 00:00:00 AM
5. Press 6 : 30	TURN-ON TIME? 06:30:00 AM
6. Press NEXT	TURN-OFF TIME? 00:00:00 AM
7. Press 5 : 30 PM	TURN-OFF TIME? 05:30:00 PM
8. Press NEXT	SKIP DAYS?
9. Press NEXT	CYCLE RATE? 00:00:00
10. Press NEXT	DUTY CYCLE ON? 00:00:00
11. Press : 25	DUTY CYCLE ON? 00:25:00
12. Press NEXT	DUTY CYCLE OFF? 00:00:00
13. Press : 5	DUTY CYCLE OFF? 00:05:00
14. Press NEXT	PROGRAM __ SAVED is displayed, Circuit #1 is ON, and the display returns to the current Day, Date, and Time of Day.

ON AND OFF PROGRAM WITH CYCLE AND DUTY CYCLE ON AND OFF

DESIRED EFFECT: To turn Circuit #3 ON for 5 seconds and OFF for 3 seconds for 10 minutes every 4 hours 18 minutes 10 seconds, starting for the first time at 11:00 AM.

PROGRAM PARAMETERS USED:

CIRCUIT NUMBER	= 3
TURN-ON TIME	= 11:00:00 AM
TURN-OFF TIME	= 11:10:00 AM
CYCLE RATE	= 04:18:10
DUTY CYCLE ON	= 00:00:05
DUTY CYCLE OFF	= 00:00:03

TIME WHEN PROGRAM IS SET: 1:00 PM.

USER ACTION	DISPLAY DESCRIPTION
1. Press PROGRAM	PROGRAM NUMBER? and the next open program number is displayed.
2. Press NEXT	CIRCUIT NUMBERS?
3. Press 3	CIRCUIT NUMBERS? 3
4. Press NEXT	TURN-ON TIME? 00:00:00 AM
5. Press 11	TURN-ON TIME? 11:00:00 AM
6. Press NEXT	TURN-OFF TIME? 00:00:00 AM
7. Press 11 : 10	TURN-OFF TIME? 11:10:00 AM
8. Press NEXT	SKIP DAYS?
9. Press NEXT	CYCLE RATE? 00:00:00
10. Press 4 : 18 : 10	CYCLE RATE? 04:18:10
11. Press NEXT	DUTY CYCLE ON? 00:00:00
12. Press : : 5	DUTY CYCLE ON? 00:00:05
13. Press NEXT	DUTY CYCLE OFF? 00:00:00
14. Press : : 3	DUTY CYCLE OFF? 00:00:03
15. Press NEXT	PROGRAM __ SAVED is displayed and the display returns to the current Day, Date, and Time of Day.

SUN-RELATIVE PROGRAM

DESIRED EFFECT: To turn outdoor lighting on from 30 minutes before sunset to right at sunrise.

PROGRAM PARAMETERS USED:

1ST PROGRAM (TURN-OFF):

CIRCUIT NUMBERS	= 5, 6
TURN- OFF TIME	= 01:00:00 AM *
CYCLE RATE	= SUNRISE RELATIVE 00:00:00

2ND PROGRAM (TURN-ON):

CIRCUIT NUMBERS	= 5, 6
TURN-ON TIME	= 01:00:00 AM *
CYCLE RATE	= SUNSET RELATIVE 23:30:00

* or any non-zero time to be replaced with sun-relative time provided by ChronTrol

TIME WHEN PROGRAMS ARE SET: 2:00 PM.

NOTE: The OFF program should be set BEFORE the ON program to avoid circuits turning on momentarily between programs.

TURN-OFF PROGRAM

USER ACTION	DISPLAY DESCRIPTION
1. Press PROGRAM	PROGRAM NUMBER? and the next open program number is displayed.
2. Press NEXT	CIRCUIT NUMBERS?
3. Press 5 : 6	CIRCUIT NUMBERS? 5:6
4. Press NEXT	TURN-ON TIME? 00:00:00 AM
5. Press NEXT	TURN-OFF TIME? 00:00:00 AM
6. Press 1	TURN-OFF TIME? 01:00:00 AM
7. Press NEXT	SKIP DAYS?
8. Press NEXT	CYCLE RATE? 00:00:00
9. Press AM/PM	SUNRISE RELATIVE? 00:00:00
10. Press NEXT	DUTY CYCLE ON? 00:00:00
11. Press NEXT	DUTY CYCLE OFF? 00:00:00
12. Press NEXT	PROGRAM __ SAVED is displayed, Circuits 5 and 6 are OFF, and the display returns to the current Day, Date, and Time of Day.

TURN-ON PROGRAM

USER ACTION	DISPLAY DESCRIPTION
1. Press PROGRAM	PROGRAM NUMBER? and the next open program number is displayed.
2. Press NEXT	CIRCUIT NUMBERS?
3. Press 5 [:] 6	CIRCUIT NUMBERS? 5:6
4. Press NEXT	TURN-ON TIME? 00:00:00 AM
5. Press 1	TURN-ON TIME? 01:00:00 AM
6. Press NEXT	TURN-OFF TIME? 00:00:00 AM
7. Press NEXT	SKIP DAYS?
8. Press NEXT	CYCLE RATE? 00:00:00
9. Press AM/PM	SUNRISE RELATIVE? 00:00:00
10. Press AM/PM	SUNSET RELATIVE? 00:00:00
11. Press 23 [:] 30	SUNSET RELATIVE? 23:30:00
12. Press NEXT	DUTY CYCLE ON? 00:00:00
13. Press NEXT	DUTY CYCLE OFF? 00:00:00
14. Press NEXT	PROGRAM __ SAVED is displayed, Circuits 5 and 6 remain OFF, and the display returns to the Day, Date, and Time of Day.

SUN-RELATIVE PROGRAM WITH FIXED OFF TIME

DESIRED EFFECT: To turn parking area lights on at sunset and off at 11:30 PM.

PROGRAM PARAMETERS USED:

CIRCUIT NUMBERS	= 9, 10
TURN-ON TIME	= 01:00:00 AM *
TURN-OFF TIME	= 11:30:00 PM
CYCLE RATE	= SUNSET RELATIVE 00:00:00

* or any non-zero time to be replaced with sun-relative time provided by ChronTrol

USER ACTION	DISPLAY DESCRIPTION
1. Press PROGRAM	PROGRAM NUMBER? and the next open program number is displayed.
2. Press NEXT	CIRCUIT NUMBERS?
3. Press 9 [:] 10	CIRCUIT NUMBERS? 9:10
4. Press NEXT	TURN-ON TIME? 00:00:00 AM
5. Press 1	TURN-ON TIME? 01:00:00 AM
6. Press NEXT	TURN-OFF TIME? 00:00:00 AM
7. Press 11 [:] 30 PM	TURN-OFF TIME? 11:30:00 PM
8. Press NEXT	SKIP DAYS?
9. Press NEXT	CYCLE RATE? 00:00:00
10. Press AM/PM	SUNRISE RELATIVE? 00:00:00
11. Press AM/PM	SUNSET RELATIVE? 00:00:00
12. Press NEXT	DUTY CYCLE ON? 00:00:00
13. Press NEXT	DUTY CYCLE OFF? 00:00:00
14. Press NEXT	PROGRAM __ SAVED is displayed and the display returns to the current Day, Date, and Time of Day.

MIDNIGHT OVERLAP PROGRAMS WITH SKIP DAYS

DESIRED EFFECT: To turn Circuits 1 and 4 ON Monday through Saturday at 7:30 AM and OFF Monday through Sunday at 2:30 AM.

This requires 2 programs assigned to the same circuits; one program with a TURN-ON TIME and SKIP DAY, and the second program with a TURN-OFF TIME only.

PROGRAM PARAMETERS USED:

1ST PROGRAM:	CIRCUIT NUMBERS	= 1, 4
	TURN-ON TIME	= 07:30:00 AM
	SKIP DAYS	= SUNDAY
2ND PROGRAM:	CIRCUIT NUMBERS	= 1, 4
	TURN-OFF TIME	=02:30:00 AM

TIME WHEN PROGRAMS ARE SET: SATURDAY AT 11:30 AM.

TURN-ON PROGRAM

USER ACTION	DISPLAY DESCRIPTION
1. Press PROGRAM	PROGRAM NUMBER? and the next open program number is displayed.
2. Press NEXT	CIRCUIT NUMBERS?
3. Press 1 [:] 4	CIRCUIT NUMBERS? 1:4
4. Press NEXT	TURN-ON TIME? 00:00:00 AM
5. Press 7 [:] 30	TURN-ON TIME? 07:30:00 AM
6. Press NEXT	TURN-OFF TIME? 00:00:00 AM
7. Press NEXT	SKIP DAYS?
8. Press SUNDAY	SKIP DAYS? SUN
9. Press NEXT	CYCLE RATE? 00:00:00
10. Press NEXT	DUTY CYCLE ON? 00:00:00
11. Press NEXT	DUTY CYCLE OFF? 00:00:00
12. Press NEXT	PROGRAM __ SAVED is displayed, Circuits 1 and 4 are ON, and the display returns to the Day, Date, and Time of Day.

TURN-OFF PROGRAM

USER ACTION	DISPLAY DESCRIPTION
1. Press PROGRAM	PROGRAM NUMBER? and the next open program number is displayed.
2. Press NEXT	CIRCUIT NUMBERS?
3. Press 1 [:] 4	CIRCUIT NUMBERS? 1:4
4. Press NEXT	TURN-ON TIME? 00:00:00 AM
5. Press NEXT	TURN-OFF TIME? 00:00:00 AM
6. Press 2 [:] 30	TURN-OFF TIME? 02:30:00 AM
7. Press NEXT	SKIP DAYS?
8. Press NEXT	CYCLE RATE? 00:00:00
9. Press NEXT	DUTY CYCLE ON? 00:00:00
10. Press NEXT	DUTY CYCLE OFF? 00:00:00
11. Press NEXT	PROGRAM __ SAVED is displayed, and the display returns to the current Day, Date, and Time of Day.

NOTE: The ON schedule program skips Sunday only, while the OFF schedule program doesn't skip any days. Since the circuits never went ON on Sunday because of the SKIP DAY schedule, it doesn't matter if an OFF signal is sent Monday morning at 2:30 AM.

ChronTrol® Service

ChronTrol service, during or after warranty period, is available from ChronTrol Corporation, San Diego, CA, USA.

Should you have difficulty with ChronTrol, call the ChronTrol Service Hotline at (800) 854-1990. Be prepared to follow the Service Technician's instructions. This may require having the ChronTrol within reach, if possible, or having pencil and paper ready to take notes or instructions. If the Technician issues a Returned Material Authorization (RMA), return the ChronTrol, postpaid, to the address given by the Technician, WITH A DESCRIPTION of the problem.

Enclose $10.00 to cover shipping and handling charges on all returns. If under warranty, no additional charges will be made. Non-warranty repair costs will be advised for approval prior to correction and return.

CAUTION: There are no user-serviceable parts inside a ChronTrol Timer. Servicing must be performed by a ChronTrol Corporation Authorized Service Technician.

Warranty

ChronTrol Timers are warranted to be free from defects in workmanship or material under normal use and service, for a period of one (1) year from date of purchase by the user.

ChronTrol Corporation's obligation under this Warranty is limited to repairing or replacing at its Factory Service Center, any product which shall, within the time limit set forth above, be received at its Factory Service Center with transportation charges prepaid, provided that ChronTrol Corporation’s examination discloses to its satisfaction that such product is defective.

Any adjustment or replacement of defective parts made under this Warranty does not void the Warranty; nor does it extend the original Warranty Period.

This Warranty shall not extend to any ChronTrol product which has been tampered with or repaired by someone other than a ChronTrol Corporation Authorized Service Technician, nor to any product which has been subject to misuse, neglect, accident or damage, or which has not been properly installed and tested in operation.

Under no circumstances shall ChronTrol Corporation be liable to any purchaser or third party for any loss of profits or other direct or indirect costs, expenses, losses or consequential damages arising out of, or as a result of, any defects in, or failure of, or any part or parts thereof.

THIS WARRANTY IS IN LIEU OF ANY OTHER WARRANTY, EITHER EXPRESS OR IMPLIED, AS TO DESCRIPTION, QUALITY, MERCHANTABILITY, FITNESS FOR ANY PARTICULAR PURPOSE OR USE, OR ANY OTHER MATTER.

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