

## COLLECTION BOTTLE ROTATOR-- MODEL 1512

### *Instructions*

### **Description**

The Collection Bottle Rotator (Model 1512) is a device that allows segregating the catch of any of our miniature mechanical or pheromone traps or a collection device of your design into 8 bottles over periods of time determined by a programmable timer. The design permits almost complete flexibility in the collection schedule which may range in total length from a few hours (or even minutes) to weeks. Timer accuracy is  $\pm 4$  minutes per year. An internal backup battery maintains the current date/time and switching program for several days without external power. The Collection Bottle Rotator (CBR) requires 12 VDC and supplies timer-switched 12 VDC power to the trap via a pair of 5-way binding posts on the top of the housing. Live catches are possible as all bottles except the one under the trap are covered.

### **Electrical Requirements and Connections**

The timer circuit of the CBR requires 12 VDC and 10 mAmps per hour operate; when the platen moves from one bottle to the next, the draw is 130 mAmps for ca. one second per bottle. Hence, the size, i.e., the amp-hour rating, of the external battery is determined by the requirements of the attached trap and the hours of operation programmed in for a particular collection run. For example, if your trap requires 250 mAmps per hour and the program called for eight collections of one-hour each, the current required for the run would be 8 hrs times 0.250 amps per hr or 4.0 amps total; this would be safely handled by a 12VDC 10 AmpHr gel-cell battery. The power consumption of the CBR (timer and the platen's gearmotor) is trivial compared to the trap consumption.

The external gray cord set with its red and black leads is used to attach the CBR to the external battery. The color-coded terminals on the top of the unit provide timer-switched 12 VDC power to the trap which is installed into the top of the Collection Bottle Rotator. This 12 VDC is appropriate for any of our 12 volt blacklight traps. The standard CDC Miniature Light Trap, Model 512, however, requires 6 VDC. Users can order a Model 512 modified to operate on 12 VDC from us for use with the CBR or modify one of their own by using a 12-volt/330-mAmps bulb (CM-1816) and installing a 10-wt/50- $\Omega$  resistor in series with the motor— call if you need parts and/or some help.

The CBR and power supply terminals are protected with a 7-amp fuse that is mounted in-line at the battery-terminal end of the power cord.

### **Operation**

#### ***Outdoor mounting***

The central stainless steel rod extending from underneath the Collection Bottle Rotator is used to support the unit and associated trap; the diameter is 0.50" (18 mm). This should be inserted into a user-supplied piece of pipe or wood which has been driven into the ground. It is important that the platen of the CBR is horizontal and that the power supply cord and the support do interfere with the rotation of the bottles; most of the units we see for repair were damaged by a fall damaging the housing. Insert the base of your insect trap into the screened holder located on the top of the CBR unit; the inside diameter of the holder is 3.87" (98 mm). Secure the trap with the thumb screws.

## ***Live or dead collections?***

You can fill the 8 collection bottles with a few ounces of water or a water and alcohol solution and then screw them into the jar lids fastened to the bottom side of the platen; some users collect into dry bottles by using a DDVP-based material to provide knock-down.<sup>1</sup>

Live catches are possible because at the end of each programmed ON time the platen will rotate to the next bottle and stop; the previous catch is prevented from flying out, the bottle now being covered with the internal cover over all bottles except the one under the trap. Note that after collecting into the eighth bottle, bottle one will be brought under the inactivated trap, possibly permitting the loss of catch from this bottle.

## ***Electrical connections***

If your collection device requires 12 VDC power, connect it to the switched red (+) and black (-) 5-way power supply terminals on the top of the CBR. The gray power supply cord of the CBR is connected to an external 12 VDC battery. The red lead is positive (+) and the black lead is negative (-); connecting the CBR to the battery with reversed polarity will not harm the unit, but, it will not run either.

## ***Manual movement of bottles***

The bottle positions are marked consecutively from 1 to 8 on the underside of the bottle platen; the rotation is from one to eight. There is a small push button switch located near the trap holder on the top of the CBR. With the CBR connected to external power, momentarily press this until you hear it click and the platen will rotate one bottle; this takes ca. 4 seconds. Each time the switch is pressed, the platen will rotate, automatically stopping when the next bottle comes into position under the trap. When setting up for a run, manually move the platen using the button switch until platen position labeled 1 is under the trap; the second bottle to be filled will be labeled as 2, etc.

## ***Operation of the timer unit***

### **Battery backup of timer data**

The timer module is located in the small white screw-top container on top of the CBR. The timer has volatile memory so that if the CBR is disconnected from an external power source for several days, the internal nickel-cadmium reserve battery in the timer module can completely discharge and the LCD display, the switching programs, and the date/time information will be lost. Once the unit is reconnected to a 12 VDC source, it may take a few moments for the timer display to become visible. The internal ni-cad battery alone will not run the CBR; even if you do not need power for your trap, the CBR requires 12 VDC to operate the gearmotor and to energize the switch relay in the timer module. *Be careful to keep the timer enclosure tightly closed when in operation, the circuitry can stand humidity but not rainfall on to the face of the timer itself.*

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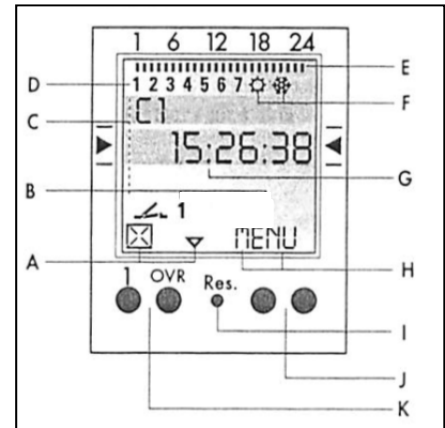
<sup>1</sup> See <http://www.herconenviron.com/insecticidal-strips.php> for information; this is distributed by a number of suppliers, e.g., Great Lakes IPM and Gemplers.

## General information on the timer


• The display icons are shown in the figure on the right and the various aspects of the display and the 5 buttons are identified below (**A** through **K**). Note, the figure shows the timer in the Automatic (or Run) mode.


**A:** Function status displays (icons); these are controlled by the two left-hand buttons indicated by **K**; on different menus these symbols will change indicating context-sensitive definitions. The bottom of the display above the buttons displays different icons depending on what menu you are in; other menus are listed when you press the right-most button associated with **MENU** on the display.

Note: With experience you will see that the buttons have to be pressed for a brief moment; a quick poke will not activate them.



**B:** Switch status icon:

 Indicates that timer switch is ON (closed) and the red and black 5-way binding posts on the top of the CBR will be energized; a trap connected to them would be running.

 Indicates that the timer switch is OFF (open) and that no power is being output to the posts.

**C:** This timer switches a single circuit (or channel) C1.

Below the channel display area (C1) are 3 communication lines for the display of time, status of the switch, and menu-specific icons.

**D:** Day-of-week display, a display of 1 means it is Monday, 5 indicates Friday; a display of 6 or 7 indicate that the day is Saturday or Sunday, respectively.

**E:** Overview of daily switching program.

**F:** Display of the status of daylight savings time setting where on (snowflake icon) or off (no icon).

**G:** If the CBR is attached to the external battery, the time separators (:) will be lit; if the CBR is disconnected from the external battery and these separators will blink and the timer will be running off its internal battery.

**H:** The icons here change depending on what menu you are in; in the figure, the display is what is seen in the Automatic (or Run) mode. Displays or icons here these are controlled by the two right-hand buttons identified by **J**.

Buttons:

**I:** Pressing this recessed button will reset the timer deleting the date and time information. However, the programs are retained in the case of a reset but the date and time must reset. Press reset button with a blunt object (pen).







**J:** Right-hand buttons.

**K:** In the Automatic (or Run) mode when the current time is displayed and **MENU** is visible in the lower right-hand corner of the display, the button labeled on the bezel "1" can be used to manually toggle between ON and OFF; when ON you will see (bottom left) the closed circuit symbol and **OVR** on the display. The middle communication line shows the selectable menu item. If confirmed with an OK press, this item is activated.

Note:

- Flashing texts or symbols require an entry.
- If no entries are made within the next 2 minutes, the clock reverts to Automatic (or Run) mode.

Function displays operated by the two buttons on the left:

	Scroll up a line in the menu
	Scroll down a line in the menu
	Select/Reject the suggestion
	Select/Accept the suggestion
	Press briefly = +1, Press and hold (ca. 2 seconds) = +5
	Press briefly = -1, Press and hold (ca. 2 seconds) = -5

Function displays operated by the two buttons on the right:

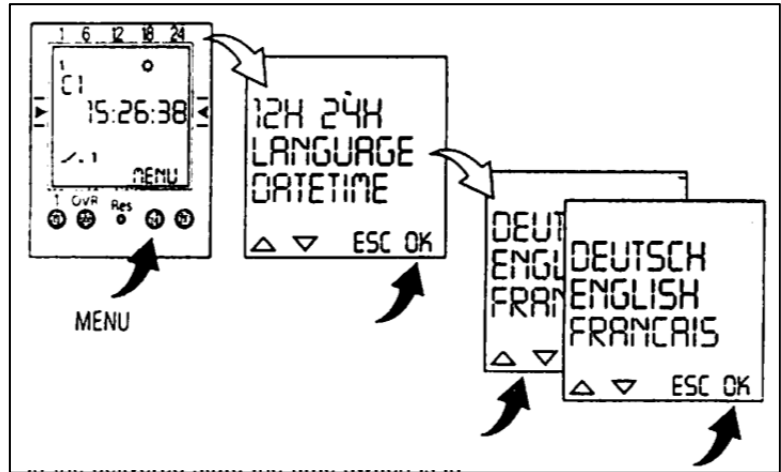
<b>MENU</b>	Exits the Automatic (or Run) mode and enters the Programming mode where you can select the following menus: PROGRAM, DAYLIGHT, 12H 24H, LANGUAGE, and DATETIME.
<b>ESC</b>	Press briefly to step back (or up) in a menu. Pressing and holding (approx. 2 sec) will return the timer to Automatic (or Run) mode.
<b>OK</b>	Make selection and apply.
<b>EDT</b>	When in the program REVIEW menu, this button permits editing an existing pair of ON/OFF commands in the program.
<b>NO</b>	Do not execute command.
<b>YES</b>	Execute command.
<b>DEL</b>	Delete.

### Initial start-up

When delivered from the John W. Hock Company the timer will be in the Automatic (Run) mode with the time preset to the current EST time, day, month, and year. The timer will be set to automatically move forward in March to reflect Daylight Savings (Summer) Time (DST) and back again one hour in November. DST is the practice of advancing clocks one hour so that evenings have more daylight and mornings have less. In the USA clocks are adjusted forward one hour on the second Sunday in March at 2:00AM; they are adjusted backward one hour at 2:00AM on the first Sunday in November, a period of almost two-thirds of a year.

## Setting the time and other features

To adjust any of the time/date/DST/12-24-hr mode, start from the Automatic (or Run) mode where MENU is seen on the display as above; if you see at the bottom right the display of ESC and OK, press ESC until ESC and OK are replaced with MENU. Starting at the screen showing MENU, press the MENU button (second from right) and the display will show on separate lines DATETIME, PROGRAM, and DAYLIGHT; this is a circular menu that includes these items and (if you cursor up or down using the buttons associated with the up and down triangles (see above table) the



additional menu items 12H 24H and LANGUAGE (see figure above showing (left) the MENU button being pressed, then cursoring up to LANGUAGE, pressing OK (center), then selecting a language and pressing OK again to select it (right two cartoons); a final push of ESC will return from the menu screen (above left image) back to the Automatic (or Run) display. Use the up/down triangles to move the menu item you want to adjust until it lines up with the gray inward-pointing triangles on either side of the display on the bezel; to select that item, press the OK button and you will enter that particular menu. For this and to adjust all other functions, cursor up/down to find your selection and press OK to select. To go back out of a menu, press ESC as many times as necessary until you get back to the Automatic (or Run) display showing MENU in the lower right-hand corner of the display.

## How the timer operates in the CBR

You are going to enter into the timer up to 8 pairs of times and days when you want the trap to run. Each pair will consist of a start (ON) time and the corresponding ending (OFF) time; each time an OFF command is executed by the timer, the platen will rotate to the next bottle. There must be a minimum of one minute between each OFF time and the next ON time. The example below would collect for eight periods, each lasting 59 minutes; the run begins at 6:00 PM (18:00 hrs) on Wednesday (on the timer display as day 03) and finishes the last collection period at 02:00 AM the next day (indicated by day 04, Thursday). Making a table like this one with bottle-associated start and stop times is very useful; plan the start/stops first, then you just have to concentrate on programming the correct times, the ONs and OFFs, and the day(s) of the week.

Collection bottle	Programmed times		Day	Comments
	Start (ON)	End (OFF)		
1	18:00	18:59	1	The CBR is positioned with bottle #1 under the trap and the timer in the OFF position. At 6:00PM the trap will start filling into bottle #1. At 6:59 the trap shuts off and the platen rotates to put empty bottle #2 under the trap.
2	19:00	19:59	1	Note that between the time that the collection was completed in #1 and the start of filling #2 is the minimum of 1 minute.
3	20:00	20:59	1	
4	21:00	21:59	1	
5	22:00	22:59	1	
6	23:00	23:59	1	
7	00:00	00:59	2	
8	01:00	01:59	2	Note that at the end (01:59 AM) of the last collection period, bottle #8 is going to rotate under the internal platen cover and will thus EXPOSE bottle #1 to underside of the powered off trap permitting live insects in bottle #1 to escape... hence the advantage of collecting into a killing agent

## Entering programs—background information

The timer unit can store more pairs of ON/OFF commands (25) than you will need to operate you CBR with eight bottles. You may specify the day(s), hour, and minute when an ON or OFF event will occur. When the switch goes to ON, the power supply terminals for the trap will become energized (up to 2 Amps at the voltage of the external battery). When the associated OFF command is encountered, the platen moves to the next bottle, and the power supply terminals for the trap are de-energized.

When using light traps which collect only when energized, it is possible to intersperse collection periods with breaks of no collections. For example, you could program the first bottle to contain material caught from 6:00 PM to 12:00 PM on Monday, bottle 2 to contain material caught from 6:00 PM to 12:00 PM on Tuesday, etc. During the 18 hours between collection periods, the trap would not be energized by the terminals in the top of the CBR. For traps that cannot be shut off, e.g., pheromone traps, the contents of a bottle represent everything captured since the last OFF was encountered and a new bottle was moved beneath the trap.

The timer has a 7-day time base and will repeat your ON/OFF program each week even if your last program command was OFF. Thus, for example, if your program consisted of only a single ON followed by an OFF 12 hours

later on, let's say for the day of Monday, the bottles would contain specimens captured on each the subsequent 8 Mondays captured over the course of the next 2 months.

The following outline will help you enter your program of ON and OFF events. Remember, when the timer encounters an ON command, it energizes the trap terminals on the top of the CBR until an OFF is encountered causing the platen to rotate one bottle location. The timer does not move sequentially through the program steps, rather, the unit scans all program commands every minute, and if the current time corresponds to a time in one of the program steps, it simply sets the switch to what is called for in that command. For many users, they first enter all of the ON commands and their times, then they enter all of the off steps.

## How to enter and edit your timer program

From the Automatic (or Run) display press MENU (you may need to press ESC one or more times until you return to the Automatic display page. Having pressed MENU, cursor down until PROGRAM is between the right and left bezel arrows and press OK; NEW should be centered in the display, if not, cursor to NEW, and press OK. If you have no times programmed in the display should momentarily indicate 50 FREE; each programmed pair of an ON and an OFF requires 2 of the total of 50 set points. The display will now have the numbers 1-7 flashing on the top of the display indicating that if accepted by pressing the button under the check symbol (it will also display CHL ON indicating you are programming in the ON event), the ON/OFF pair you are about to enter will occur every day of the week. If you want to specify a particular day(s) use the left 2 buttons to reject or accept particular days. If you get confused or are having trouble here, just use the ESC button to exit; then reenter the PROGRAM menu and start again. Assuming every day is okay and you pressed the accept button and then the flashing OK button, the display will show you a flashing 00 under HOURS indicating need for you to enter the hours when the on event will occur... use the + and the - buttons to set the hour, then press OK, now under MINUTES will be the flashing display asking to the minutes of the ON event. Enter them and press OKAY. Having now set the hours and minutes of the ON event, the display will again display HOURS and the flashing 2-digit hour number you just entered for the ON event indicates input needed; notice the bottom of the display now shows CHL OFF indicating you are entering the data for the associated OFF event. Having entered all the information required for an ON/OFF event, the display will indicate POS 01 POS 02 indicating you have programmed memory locations 01 and 02, you have 40 locations remaining. Repeat this process until you have all your start and stop times programmed. Remember to leave the unit in the OFF position (switch open) using left button to manually set it from the Automatic (or Run) page.

To edit a program, simply from the Run display page, press MENU, then cursor to PROGRAM, and cursor to EDIT and follow the prompts.

## *Traps available for use with the Collection Bottle Rotator*

1. The **CDC Miniature Light Trap, Model 512**. The **Model 512** is an improved version of the mosquito light trap developed by scientists from the Centers for Disease Control (CDC) . The trap was designed for mosquito abatement operations and arbovirus survey purposes. It is constructed of an acrylic cylinder housing a small motor/fan. Attraction is from an incandescent bulb. The trap is covered by a rainshield. The unit can be supplied for 12 VDC operation for use with the CBR.
2. The **Miniature DownDraft Blacklight Trap, Model 912**. Similar in construction to the **Model 512**, this trap employs a 4-wt blacklight tube and a very efficient transistorized inverter-ballast to provide radiation in the near-UV range (ca. 320-420 *nm*). Blacklight is attractive to a great diversity of insects of medical, veterinarian, and agricultural importance. The trap requires 12 VDC and ca. 500 mAmps/hour to operate.