

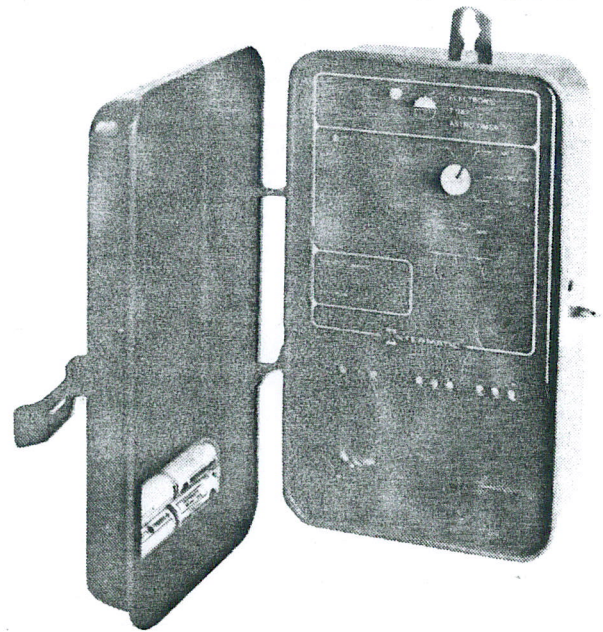
# Model ET833CR Electronic 7-Day Astronomic TIME SWITCH WITH BATTERY POWERED CARRY-OVER

2 POLE DOUBLE THROW CONTACTS

## INTRODUCTION

This Electronic 7-Day Astronomic Time Switch is designed to turn lighting loads ON at Sunset and OFF at Sunrise on a yearly schedule. Only the current date, time and current days sunset and sunrise times need be entered for full year lighting control. It is accurate to the minute, easy to program and flexible enough to accommodate the most demanding schedules. Ideal for schools, churches, parking lots, signs, displays and other applications where accurate, cost efficient and reliable control of lighting is desired. The new Intermatic Electronic Astro Timer features are:

- The sunset and/or sunrise switching times may be OFF-SET, if so desired. Offset means switching times may be programmed to occur prior to or later than the actual sunset and/or sunrise.
- One FIXED ON and/or one FIXED OFF time can be set for selected day(s) of the week.
- A rechargeable battery backup will maintain the program for 24 hours in case of power interruptions. The time switch may be programmed using battery power only.
- An Indoor/Outdoor enclosure is standard and the Timer will operate from -40°F to +150°F (-40°C to +65°C) ambient temperatures.
- It is UL Listed and CSA approved.



## SPECIFICATIONS

### TIMER POWER

277 volt A.C. 60 Hz.  
2.5 watts maximum

### SWITCH RATING

- 10 Amp resistive 24, 120, 240 or 277 volt A.C. 60 Hz.
- 480 VA Pilot Duty 120/240/277 volt A.C. 60 Hz.
- Tungsten Rating  
600 Watts N.O., 240 Watts N.C.  
120/240/277 VAC
- Ballast Rating  
480 VA - 277 VAC

### KNOCKOUTS

Two on bottom combination 1/2" - 3/4"

### CARRYOVER

Maintains program and correct time within 0.01% accuracy for 24 hours.

### SHIPPING WEIGHT

2.7 lbs.  
(1.2 Kg.)

### CASE

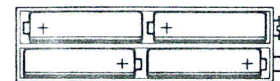
Steel gray with hasp for locking  
9-3/8" (23.8 Cm.) High  
5-1/2" (14.0 Cm.) Wide  
3-5/8" (9.2 Cm.) Deep  
Raintight

### OPERATING TEMPERATURE RANGE

-40°F (-40°C) to 150°F (65°C)  
Battery Capacity And  
Charge Acceptance Will Be  
Less Than Nominal Outside  
Of 32°F (0°C) to 104°F (40°C)

© 1983 INTERMATIC INCORPORATED

### BATTERY BACKUP



After a full 8 hour charge the batteries should nominally measure 1.25 volts per cell or 5.0 volts for the (4) cells.

**CAUTION: IF REPLACING THE BATTERIES OBSERVE THE CORRECT BATTERY POLARITY TO AVOID DAMAGE TO THE TIMER OR THE BATTERIES. USE FOUR AA SIZE NICKEL CADMIUM RECHARGEABLE BATTERIES. SUCH AS PANASONIC 1.2V MODEL P-50AA 500 mAh. DO NOT USE ALKALINE BATTERIES. THEY MAY BURST OR EXPLODE WHEN RECHARGED. Charge time approx. 8 hrs. Expected life greater than 5 years.**

# INSTALLATION

**MOUNT CASE:** (Fig. 1) Remove the mechanism mounting screw and lift out the Electronic Time Switch. Mount case at the desired location, eye level if possible, using anchors if necessary.

**SET LATITUDE:** Using the Astronomic Latitude Zone Map provided, determine the correct zone for your geographic location and set zone selector switch, on the rear, accordingly (Fig. 2).

## ZONE LATITUDE

1. 24° to 29°
2. 29° to 33°
3. 33° to 37°
4. 37° to 40°

## ZONE LATITUDE

5. 40° to 43° (Preset)
6. 43° to 46°
7. 46° to 48°
8. 48° to 50°

## REINSTALL MECHANISM IN THE ENCLOSURE:

**MAKE WIRE CONNECTIONS:** CAUTION TURN POWER OFF AT THE PANEL BOARD. You may have to remove two fuses or switch two breakers to the OFF position.

Lift left side of insulator off retaining post and pivot it up and away to expose the terminal strip. Connect LINE and LOAD wires to terminals, see door label or page 4 of this manual. Insert the stripped ends of COPPER wires (18 to 14 gauge, solid or stranded) under the pressure plate and securely tighten the terminal screws. Do not use aluminum wires. Be sure wire insulation clears pressure plate. Install surge suppressor when switching an inductive load, to minimize electrical noise and reduce contact wear. Use 176ET22A for 277 volt nominal load; supplied with unit. Follow installation instructions supplied with the surge suppressor. Do not install surge suppressors on the normally open and normally closed side of the same contact. For 240 volt nominal loads order part number 176ET10A; for 120 volt use 176ET9A and for 24 volt use 176ET8A. The load(s) will be cycled on and off in the programming steps to follow. If this is not desirable do not connect power to the loads at this time.

**GROUND THE TIME SWITCH:** Use the ground connection at the bottom of the case; securely connect all grounding leads to this terminal. Check wiring, then pivot the plastic insulator back in place to completely cover the terminal strip. Connect battery leads. (See battery information under specifications).

**REAPPLY POWER:** Restore electric service. CAUTION: The normally open contacts will close at this time. The LOAD INDICATOR should be FLASHING. You may proceed directly to programming steps at this time.

# CONTROLS AND GENERAL INFORMATION

(See Fig. 1)

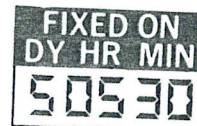
**OPERATE/PROGRAM MODE SELECTOR:** This switch must be in the OPERATE mode for the load(s) to switch automatically at the selected ON/OFF times. In PROGRAM mode data may be entered or reviewed. The load(s) will not switch automatically in the PROGRAM mode.

**DATA SELECTOR:** This switch has six positions allowing you to enter, review and revise the time and/or day and date information. Once the time switch is programmed, the display will show the following information for selected settings.

- **TIME:** Displays the current day (1=Sunday 2=Monday etc.) and the present time (Hr. and Min.). Note that the display is a 24 hour display, i.e. Monday 8:30 PM is displayed as 2 20 30
- **ASTRO ON:** A 24 hour display indicating the time the load will turn on for the current day. This time will change daily, tracking sunset. Note that in the PROGRAM mode, the day indicator will also be lit. This allows you to select, then skip; ASTRO ON for any day(s) of the week. (See OPERATE/MANUAL PROGRAM/CLEAR Pushbutton Function).
- **ASTRO OFF:** Same as the ASTRO ON except the display indicates the time the load will turn off. This time will change daily, tracking sunrise.
- **FIXED OFF:** A 7 Day/24 Hour display indicating the FIXED OFF time, when the load will turn off, for the selected day of the week. The pushbutton, controlling the left digit in the display, must be pressed to advance the days (1=Sun., 2=Mon., etc.) in order to review the programmed FIXED OFF time for each day. If a FIXED OFF time is not programmed for a day the display will show NoOP indicating No OPERATION for that day.
- **FIXED ON:** Same as FIXED OFF except the display indicates the FIXED ON time for the selected days of the week. This is the time the load will turn on.
- **DATE:** Displays the current month and day. Example: 1122 for November 22.

**DISPLAY INDICATOR:** A rotating disc which shows the data being entered or reviewed.

Example:



for a FIXED ON time of Thursday 5:30 AM

Lighted Display

The data is displayed by a (5) digit LED display viewed thru the display indicator window.

**DATA ENTRY/REVIEW PUSHBUTTONS:** These three pushbuttons are used to "roll" the desired data on the display and in the program memory during programming. In addition, the left DATA ENTRY/REVIEW pushbutton is used during review to enable review of all 7 days FIXED ON and FIXED OFF times and to review ASTRO ON and ASTRO OFF days skipped.

**OPERATE MANUAL/PROGRAM CLEAR Pushbutton:** This is a dual function pushbutton which is used in both OPERATE and PROGRAM mode.

- **OPERATE MODE:** Pressing the pushbutton manually switches the load(s) "On" and "Off", "On" meaning the normally open contacts are closed. Note, this is a temporary override: The next programmed ASTRO or FIXED ON/OFF time will switch the load(s) as programmed. If you do not want the load(s) to switch ON or OFF automatically according to the program, place the OPERATE/PROGRAM switch in the PROGRAM position.
- **PROGRAM MODE:** Pressing the pushbutton in this mode will cause NoOP to be displayed, for the day shown in the display, for ASTRO ON, ASTRO OFF,

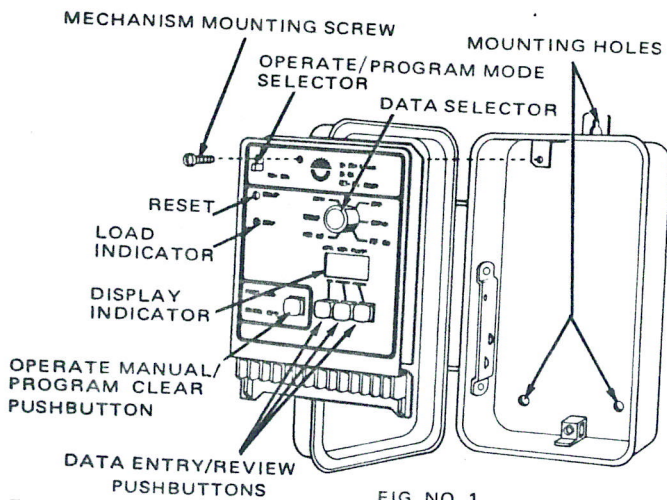


FIG. NO. 1

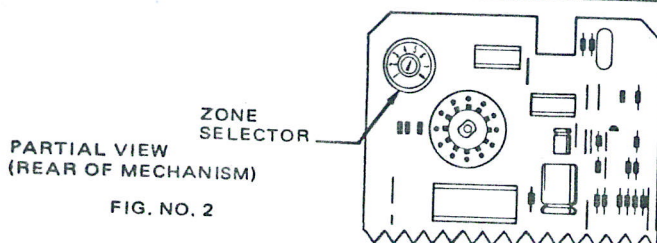


FIG. NO. 2

## PROGRAMMING STEPS

Make sure your timer schedule is completed before beginning to program the timer.

- Slide the OPERATE/PROGRAM MODE SELECTOR switch to OPERATE. Press the recessed RESET button (with a pointed object and hold for 2 seconds) to clear and reset the electronics. The load (if connected) will switch on at this time. If the load should be off press the OPERATE MANUAL/PROGRAM CLEAR pushbutton to turn it off.

**WARNING:** Do not press the RESET button after beginning to program because the entire program will be lost.

- Slide the OPERATE/PROGRAM MODE SELECTOR switch to PROGRAM. The LOAD INDICATOR will now FLASH.
- Rotate the DATA SELECTOR to ASTRO ON. Press the left DATA ENTRY/REVIEW pushbutton to "roll" the current DAY (1=Sun., 2=Mon., etc.). Press the center DATA ENTRY/REVIEW pushbutton to "roll" the ASTRO ON hour desired. (The display is a 24 hour display, i.e., 10:00 PM = 2200). Press the right pushbutton to "roll" and enter the minutes in ASTRO ON time. The data is automatically entered when "rolled" into the display and is required for the current day only.

- If skipping an ASTRO ON time is required, Press the left DATA ENTRY/REVIEW pushbutton to "roll" the day(s) you wish to skip ASTRO ON.

Once the day is displayed press the OPERATE MANUAL/PROGRAM CLEAR pushbutton. the display will show the day selected and NoOP. For example if you are skipping ASTRO ON for Monday, the display will show 2 NoOP.

- Rotate the DATA SELECTOR to ASTRO OFF. Repeat the same procedure as for ASTRO ON for programming the ASTRO OFF time for the current day and if required, for programming a skip ASTRO OFF for any day(s).

- Rotate the DATA SELECTOR to FIXED OFF. NOTE that since you reset the timer FIXED OFF and FIXED ON times for all 7 days are programmed automatically for NoOP. If FIXED OFF times are required depress the left DATA ENTRY/REVIEW PUSHBUTTON to "roll" the DAY, the center pushbutton to "roll" the HOUR and the right pushbutton to "roll" the MINUTES.

- Rotate the DATA SELECTOR to FIXED ON. If FIXED ON time(s) are required repeat the same procedure as for FIXED OFF times.

- Rotate the DATA SELECTOR to DATE. The current date only (Month and Day) is all that is required. Press the center pushbutton to "roll" the MONTH (11 for November) and press the right pushbutton to "roll" the DAY (24 for the 24th day).

- Rotate the DATA SELECTOR to TIME. The current DAY of the week and TIME is all that is required. Press the left pushbutton to "roll" the DAY (4 for Wednesday), press the center pushbutton to "roll" the HOUR and press the right pushbutton to "roll" the MINUTES (14:30 for 2:30 PM).

**PROGRAMMING IS NOW COMPLETE:** RETURN THE OPERATE/PROGRAM MODE SELECTOR TO OPERATE. The LOAD INDICATOR will now be on or off depending on whether it was on or off when you entered the program mode. When the timer is returned to the operate mode the display momentarily (for approximately 3 seconds) will show small zeros. During this time the Astro program is being calculated. Every day at midnight, this will occur while the new Astro times are similarly calculated. Press the OPERATE MANUAL/PROGRAM CLEAR pushbutton a few times and note that the LOAD INDICATOR turns on and off. This allows manual control of the load at any time to temporarily override the program.

If you have not already done so connect power to the load(s) at this time. Refer to INSTALLATION under MAKE WIRE CONNECTIONS.

FIXED ON or FIXED OFF time settings. The left DATA ENTRY/REVIEW pushbutton must be used to "roll" the desired day you wish to skip. This allows you to skip any day(s) ASTRO ON/OFF and/or FIXED ON/OFF programmed times. Note that all FIXED ON and FIXED OFF times for all days will initially show as NoOP at startup or when the time switch is reset.

**RESET:** This recessed pushbutton is used to clear the microprocessor before programming or to erase the entire program. RESET also turns on the load(s) connected to the normally open contact(s).

**LOAD INDICATOR:** In the OPERATE mode this indicates the status of the load(s).

- When the INDICATOR is LIT, load(s) on the normally open contacts are energized and load(s) on the normally closed contacts are deenergized.

- When the INDICATOR is NOT LIT, loads on the normally open contacts are deenergized and loads on the normally closed contacts are energized.

- The INDICATOR will FLASH on and off in the PROGRAM mode to indicate that automatic programmed load control will not occur until you return to the OPERATE mode.

## SAMPLE PROGRAM

- Study the following lighting schedule and note the program entries on the sample schedule. When you are ready to program your own application, fill in the schedule located on the door of the case with your requirements.

**ASSUME FOR THE EXAMPLE:**

- Today is Wednesday, November 24 and the present time is 2:30 P.M.

- The program is used to control display lights for a restaurant which opens at 4:00 A.M. and closes at 10:00 P.M. on Tuesday thru Friday. On Saturday and Sunday it opens at 6:00 A.M. and closes at 1:30 A.M. the following morning. Monday the restaurant is closed all day.

- The lights are desired to turn on 15 minutes before sunset, which today is 4:50 P.M.; and to turn off at sunrise, which today is 6:07 A.M. The lights are to be off during the hours the shop is closed. (Sunset/Sunrise times may be obtained from local weather service or newspaper).

	SUNSET ASTRO ON	SUNRISE ASTRO OFF	NIGHT FIXED OFF	MORNING FIXED ON
SU 1			1 01 30	1 06 00
MO 2	2 No OP	2 No OP	2 01 30	
TU 3			3 22 00	2 04 00
WE 4	4 16 35	4 06 07	4 22 00	4 04 00
TH 5			5 22 00	5 04 00
FR 6			6 22 00	6 04 00
SA 7				7 06 00

Current Date 1124 Current Time 4 14 30

**NOTE THE FOLLOWING Characteristics of the sample program:** The ASTRO ON and/or ASTRO OFF time(s) may be offset from the actual Sunset/Sunrise times if desired. Only one entry is required for ASTRO ON and one for ASTRO OFF. These entries are programmed for the current day. (In the example: Wednesday or day 4): The remaining days astro times are automatically calculated by the microprocessor. A NoOP entry is required only for ASTRO ON and/or ASTRO OFF time(s) you wish to skip. (In the example: Monday or day 2) A FIXED OFF Time is required on Monday morning at 1:30 A.M.

A FIXED ON and/or FIXED OFF entry must be made for each FIXED ON/FIXED OFF operation since the timer will initially show after reset all FIXED ON and FIXED OFF times as NoOP. DATE and TIME entry are required only for the current day. (In the example: Wednesday or day 4)

Spaces shown blank in the example schedule require no entries.

# PROGRAM REVIEW

You may review any or all of the programmed data at any time. To do this simply slide the OPERATE/PROGRAM MODE SELECTOR switch to PROGRAM and rotate the DATA SELECTOR to the position(s) you wish to review. Note that you must press the left DATA ENTRY/REVIEW pushbutton to enable you to review all (7) days of FIXED OFF and FIXED ON times and to review skip days for ASTRO ON and ASTRO OFF. You

may make any corrections or revisions during the review procedure simply by "rolling" in the new data. During review the ASTRO-ON and ASTRO-OFF times will be displayed for all days, unless a NoOP is programmed. Note that these times will change daily.

The load(s) will not switch automatically in the PROGRAM mode. The PROGRAM mode may be used to temporarily suspend the program. BE SURE TO RETURN THE OPERATE/PROGRAM MODE SELECTOR TO OPERATE for automatic switching of the load(s).

# TROUBLE SHOOTING

SYMPTOM	POSSIBLE CAUSE(S)	CORRECTIVE ACTION
Load does not turn on or off:	Mode selector not in "OPERATE". Fault in wiring. Load power is out. Timer requires resetting.	Set slide switch to OPERATE and press the OPERATE MANUAL/PROGRAM CLEAR pushbutton several times. If LOAD INDICATOR turns on and off, but load stays off, check connections and wiring to load. If LOAD INDICATOR does not turn on and off power may be out. Check power supply to timer and load. If power is on remove batteries. Press the recessed RESET button then press the manual pushbutton again. If light does not operate, return unit for servicing.
Load turns on or off at the wrong time:	Date, Time or Switching time(s) are in error. ZONE SELECTOR is not properly set.	Review calendar, time and day of week on display readout. If wrong, set correct time. If correct, review switching times. If ASTRO times are incorrect check the ZONE SELECTOR switch on back of mechanism. If switching times are correct, return unit for servicing.
Display does not light up or shows dim, erratic or meaningless data.	Loss of power supply. Discharged or defective battery(s).	Check power supply. If power supply is OK check batteries. Check polarity and seating. Let unit stand 10 minutes or more with power on to charge batteries. Press recessed RESET button with pen or pencil and hold for two seconds. CAUTION: RESET turns the load on. RESET clears any stored program. If unit does not clear properly try resetting with batteries removed and timer power on. Discharged batteries may drain unit of power even with power on. If unit still does not clear properly, return for service.
Time Switch appears to be gaining or losing time, display shows meaningless data or load does not switch on or off:	Electrical noise from controlled load may be interfering with Microprocessor.	Install an isolation relay between the Time Switch contacts and the load.

**NOTE:** The Time Switch is designed to prevent the load from switching ON for periods of 15 minutes or less. If an ASTRO ON is to occur within 15 minutes or less from a FIXED OFF the

ASTRO ON will be skipped. Similarly if an ASTRO OFF is to occur within 15 minutes or less from a FIXED ON the FIXED ON will not occur.

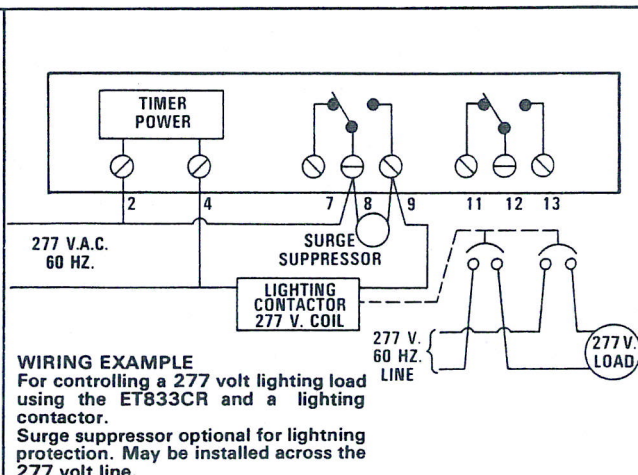
## FULL ONE YEAR WARRANTY

If within one (1) year from the date of purchase, this product fails due to a defect in material or workmanship, Intermatic Incorporated will repair or replace it free of charge.

The warranty does not apply to: (a) damage caused by accident, abuse, mishandling, dropping; (b) units which have been subject to unauthorized repair, opened, taken apart; (c) units not used in accordance with directions; (d) damages exceeding the cost of the product. Some states do not allow a limitation of damages, so the foregoing limitation may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

This warranty service is available by either (a) returning the product to the dealer from whom the unit was purchased, or (b) mailing postage prepaid to the nearest authorized service station listed. Please be sure to wrap the product securely when mailing to avoid damage. This warranty is made by: Intermatic Incorporated, Intermatic Plaza, Spring Grove, Illinois 60081.

**AUTHORIZED SERVICE STATION**  
**INTERMATIC INCORPORATED**  
 4700 West Montrose Avenue, Chicago, IL 60641



**INTERMATIC INCORPORATED**  
 SPRING GROVE, ILLINOIS 60081