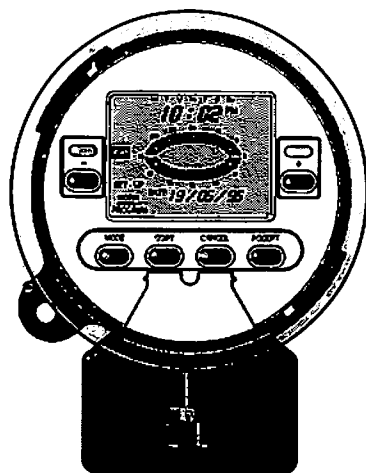


# Time Switch



**SANGAMO**  
**E750 SERIES**  
SOLAR VARIANT



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## INTRODUCTION

### Welcome

You are now the owner of the latest design of electronic time switch incorporating years of Sangamo experience in reliability and first class workmanship.

Carefully read the following instructions which comprise the recommended procedures for installing and operating the E750 time switch.

### Applications and Variants

The Schlumberger range of Sangamo Round Pattern Time Switches provides the design solution for a wide range of lighting and heating control tasks.

Two main variants of the E750 series are available:

**7 Day Standard Variant.** These timers are available with single or dual channel control allowing up to five ON and five OFF operations per channel within any 24 hour period. A maximum of 140 switching operations per week dual channel and 70 switching operations per week single channel are supported.

**Solar Mode Variant.** These timers provide single or dual channel ON/OFF switching operations which track sunrise and sunset without relying on light detection. E750 switches offer early ON and early OFF switching which allows the user greater flexibility of operation. Lighting, for example, can be switched OFF for a period during the hours of darkness when not required.

### Guarantee

This switch is guaranteed by your supplier for two years from the date of purchase. If it should become defective, please contact your installer or supplier for a replacement unit.

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This guarantee becomes invalid if the electronic circuitry has been tampered with, or if the switch has been abused or installed in an unsuitable environment.

### Repair Service

On expiry of the guarantee period, a comprehensive repair service is offered by the manufacturer. Phone number on back-cover for further information.

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## SPECIFICATIONS

### E751, E753, E764 and E772 - Solar Variants

<b>No. of Output Channels</b>	:	Dual or single programmable channels.
<b>Programming Capability</b>	:	Early ON and Early OFF with day omit.
<b>Max. No. of Status Changes</b>	:	2 ON and 2 OFF operations per day per channel with 15 minute switching resolution.
<b>Override Facility</b>	:	2 hour boost - when program OFF, Advance to OFF - when program ON, Holiday/OFF function - suspends programs.
<b>Digital Display</b>	:	12-hour digital clock, program and set-up indication (See page 5).
<b>Analogue Display</b>	:	24-hour analogue program display with 30 minute program indication.
<b>Battery Back-Up</b>	:	Automatically rechargeable battery will retain memory for typically 100 hours.
<b>Battery Recharge Time</b>	:	automatic full recharge typically 50 hours.
<b>Rating of Output Switches</b>	:	Up to 20A (resistive) — SPST or CHANGEOVER SPDT up to 230V ~ 50/60Hz.  Up to 10A (resistive) per channel — Dual SPST up to 230V ~ 50/60Hz.
<b>Ambient Temperature Range</b>	:	-10°C to +35°C

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<b>Supply Voltage</b>	:	230V, 50/60Hz AC.
<b>Max. Cable Size</b>	:	6.0mm <sup>2</sup> .
<b>Clock Accuracy</b>	:	Better than 5 minutes per year.
<b>Protection</b>		
<b>Live Parts</b>	:	This timer is completely protected by the enclosure.
<b>Dirt &amp; Moisture Protection</b>	:	IP20. Control suitable for use in a normal pollution situation.
<b>Shock Protection</b>	:	Class 2, both functional and supplementary insulation.
<b>Guarantee</b>	:	2 years.
<b>Mounting</b>	:	Wall mounted standard round pattern base.
<b>Packaging</b>	:	Cardboard outer case.
<b>Instructions</b>	:	Full instructions contained in handbook.
<b>Type 1B Control</b>		

BEAB approval applied for against BS EN 60730, part 2.7.



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## THE ELECTRONIC DISPLAY

The E750 series features a Liquid Crystal Display (LCD) incorporating an analogue program display which displays all programmed ON/OFF periods for the selected 24-hour cycle. A 12-hour digital clock displays the current local time. A timer icon is activated whenever set-up mode is selected.

The analogue program display indicates programmed switching ON periods by activating the appropriate 1/2-hour LCD segments. See Fig. 1, page 5.

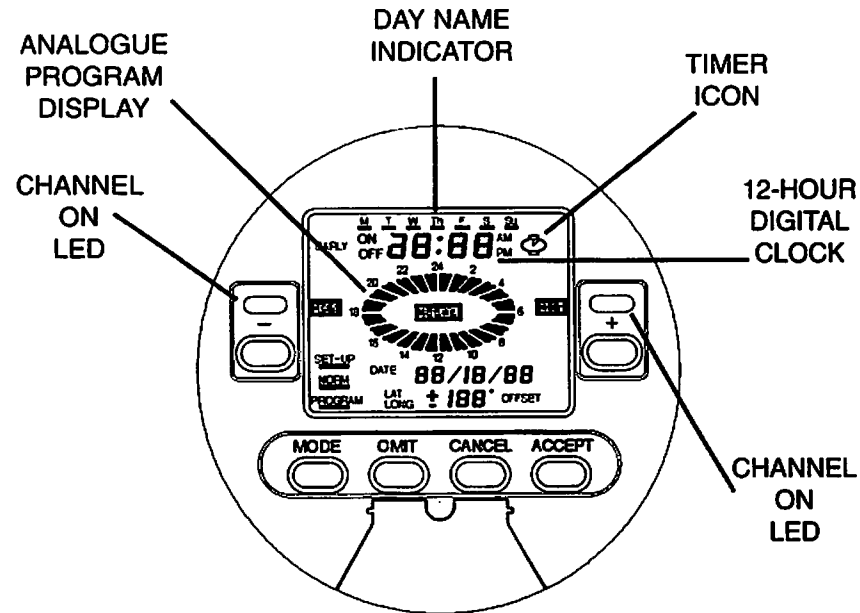


Fig. 1

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## Solar Variants

The LCD provides digital indication of local time (AM or PM), day of the week, date, mode (SETUP, NORMAL and PROGRAM), latitude, longitude, Greenwich Mean Time (GMT) offset, EARLY OFF and EARLY ON switching. Dual channel models display the channel being monitored as CH1 or CH2.

## 7 Day Standard Variants

The LCD provides digital indication of local time (AM or PM), day of the week, mode (SETUP, NORMAL and PROGRAM), current program (PROG 1-5), ON and OFF switching. Dual channel models display the channel being monitored as CH1 or CH2.

### NOTE:

The digital clock must be set on completion of installation testing and after any disruption of the power supply which exceeds the battery life of 100 hours.

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## Overall Dimensions and Mounting Positions

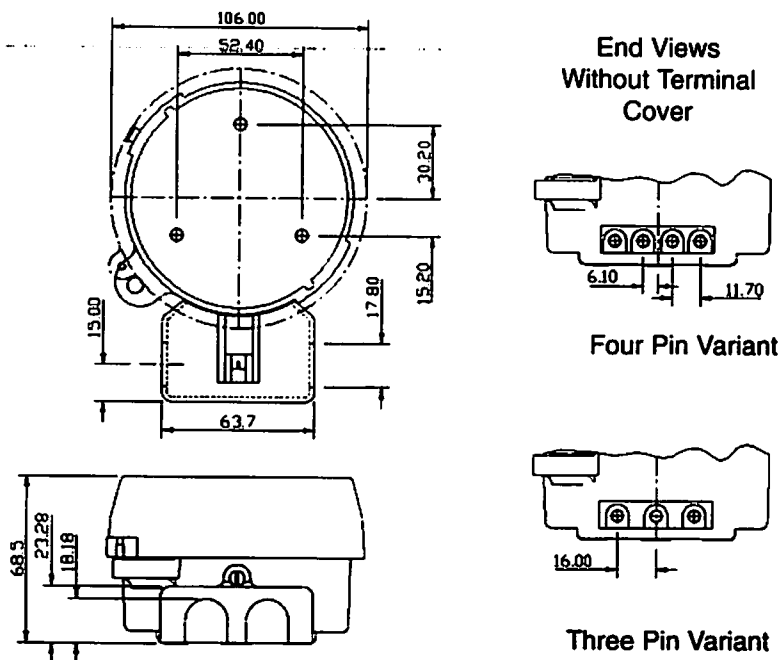


Fig. 2

NOTE: DIMENSIONS ARE IN MILLIMETRES

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## INSTALLATION INSTRUCTIONS

### To Install

#### WARNING:

Electricity can kill. Isolate mains supply before installation and servicing. Installation should be carried out by a qualified electrician, in accordance with the current edition of the IEE wiring regulations.

1. Rotate front cover anti-clockwise and remove.
2. Unscrew captive-screw C and remove extended terminal cover B. See Fig. 3, page 9.
3. Lift and pull handle A to withdraw plug-in mechanism from switch base.

#### WARNING:

Electricity can kill. It is imperative that only those screws recommended below are used to mount the switch base. Screws must be secured firmly to ensure that heads fit flush within switch base.

When securing switch base to metalised insulating material using No. 8 wood or 2BA countersunk screws, remove all metalised coverings from the area of application. Locate and secure using appropriate insulated wall plugs. When mounting the switch base on a metal surface, ensure the metal is adequately earthed to cover 20A resistive rating in accordance with IEE regulations.

#### CAUTION:

THIS PRODUCT IS NOT PROTECTED AGAINST DRIPPING OR SPLASHING MOISTURE AND MUST NOT BE LOCATED WHERE IT MAY COME INTO DIRECT CONTACT WITH LIQUIDS.

4. Remove plastic from three countersunk holes on rear of switch base. Ensure no plastic cuttings remain within switch base.

Mount switch base using three No. 8 wood screws or three 2BA countersunk screws. See Fig. 2, page 7.

- Strip insulation back 8mm from end of wire to ensure satisfactory connection with terminals. Connect fixed wiring to switch base. See Fig. 4, page 10, for the wiring diagram appropriate to your time switch model number.
- Insert and engage plug-in mechanism in switch base.

**WARNING:**

Electricity can kill. Extended terminal cover must be fitted to ensure proper insulation protection.

- Secure extended terminal cover B to switch base using captive screw C.
- Locate front cover on switch base and rotate clockwise until fully closed with lug D in position as shown. See Fig. 3, page 9.

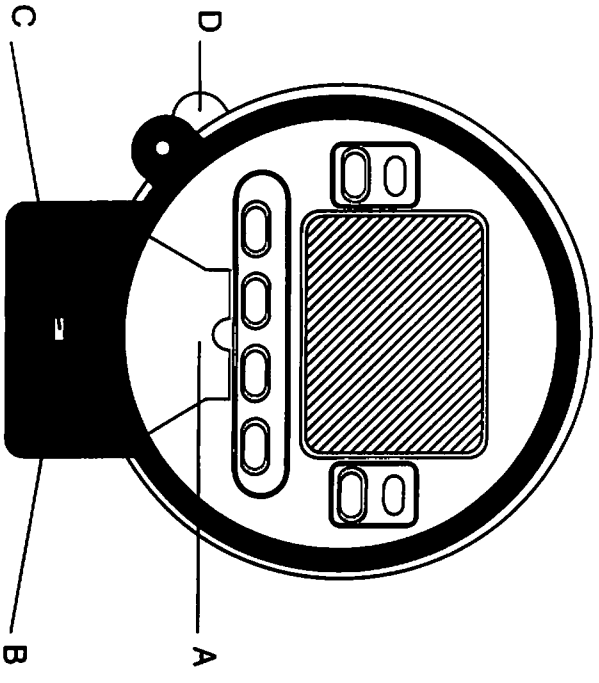
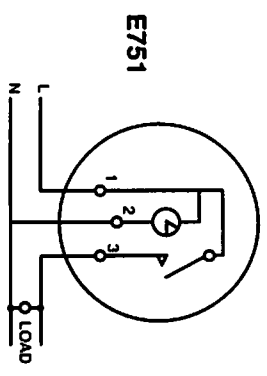
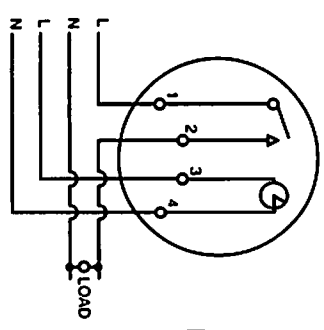


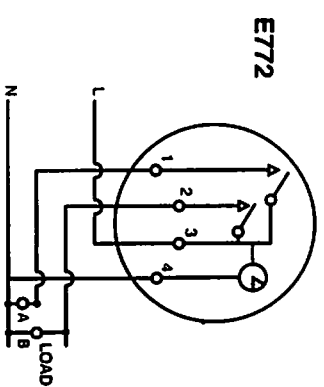
Fig. 3



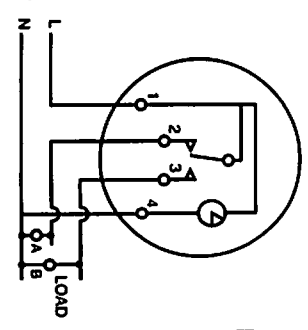
E751



E753



E772



E764

Fig. 4

**CAUTION:**  
ALTHOUGH EVERY CAUTION IS TAKEN TO ENSURE THE ACCURACY OF THE ELECTRICAL CIRCUIT DIAGRAMS SHOWN, SCHLUMBERGER ELECTRICITY OR ASSOCIATED COMPANIES CANNOT BE HELD RESPONSIBLE OR LIABLE FOR CIRCUIT CONNECTIONS OTHER THAN THOSE DIRECTLY ASSOCIATED WITH THE E750 RANGE OF TIME SWITCHES.  
TERMINALS FOR FIXED WIRING ONLY. PROVISION MUST BE MADE IN THE FIXED WIRING FOR A MEANS OF DISCONNECTION FROM THE SUPPLY HAVING A CONTACT SEPARATION OF AT LEAST 3MM ON ALL POLES.

**NOTES:**

- Maximum cable size: 6.0mm<sup>2</sup>.
- Maximum switch current - 20A (resistive). Dual channel -10A (resistive) per channel.
- This product is not suitable for use with existing Sargarmo panel mounting attachments - for clarification contact the address on the back page.

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## SETTING-UP

On completion of installation or after any disruption of the power supply which exceeds the battery life of 100 hours, it is necessary to set the initial values detailed below to ensure the correct operation of this product.

1. Rotate front cover anti-clockwise and remove. Note: On power up, SETUP mode is entered automatically.
2. Press MODE button and repeat until SETUP is indicated on LCD. See Fig. 5, page 12.

### NOTES:

- 1) On entering SETUP mode, timer icon is displayed and digital clock is flashing.
- 2) On pressing MODE at any point during the set-up procedure, the system checks the entered date for conflicting values. If date is valid, day of week is calculated and set before operation is returned to NORMAL mode. If date is not valid, ERROR indicator flashes twice and operation is returned to set day of month procedure.
3. Set 12-hour digital clock:
  - a. Press "+" or "-" button until correct time of day is displayed.

### NOTES:

- 1) Pressing the "+" button increments the digital clock by one minute. Pressing and holding the "+" button increments the digital clock at a rate of 20 minutes per second.
- 2) Advancing the minute display from 59 to 00 increments the hour display by one hour. Advancing the hour display from 11 to 12 toggles the AM/PM indicators on the LCD.
- 3) Pressing the "-" button decrements the digital clock by one minute. The "-" button exactly mirrors the behaviour of the "+" button.

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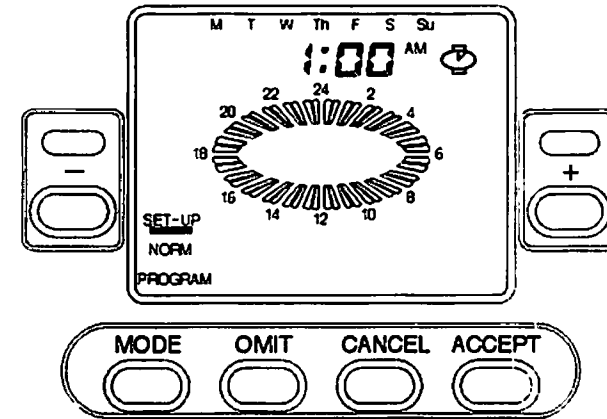


Fig. 5

- b. Press ACCEPT button to store time of day in memory. Day of month indicator is now flashing. Timer icon disappears.
4. Set day of month:
    - a. Press "+" or "-" button until correct day of month is displayed.
- NOTE:**  
Pressing CANCEL at any time during the following set-up procedures returns operation to the previous set-up procedure.
- b. Press ACCEPT button to store day of month in memory. Month of year indicator is now flashing.
5. Set month of year:
    - a. Press "+" or "-" button until correct month of year is displayed.
    - b. Press ACCEPT button to store month of year in memory. Year indicator is now flashing.

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6. Set year:
- Press "+" or "-" button until last two digits of current year are displayed.

**NOTE:**

The values 95-99 represent 1995-1999 while the values 00-94 represent 2000-2094.

- Press ACCEPT button to store year in memory.

**NOTE:**

On pressing ACCEPT, the system checks the entered date for conflicting values. If date is valid, day of week is calculated and set: LAT is indicated on LCD and latitude indicators are flashing. If date is not valid, ERROR indicator flashes twice and operation is returned to set day of month procedure.

7. Set latitude:

- Press "+" or "-" button until correct latitude is displayed. See Fig. 6, page 14, for UK variants.

**NOTE:**

Pressing the "+" button increments the latitude in two degree steps to a maximum of +90°. Pressing the "-" button decrements the latitude in two degree steps to a minimum of -90°.

- Press ACCEPT button to store latitude in memory. LONG is indicated on LCD and longitude indicators are flashing.

8. Set longitude:

- Press "+" or "-" button until correct longitude is displayed. See Fig. 6, page 14, for UK variants.

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**NOTE:**

Pressing the "+" button increments the latitude in two degree steps to a maximum of +180° before rolling over to a value of -180°. Pressing the "-" button decrements the longitude in two degree steps to a minimum of -180° before rolling over to a value of +180°.

- Press ACCEPT button to store longitude in memory. NORMAL mode is indicated on LCD. Solar switching times are shown on analogue display.

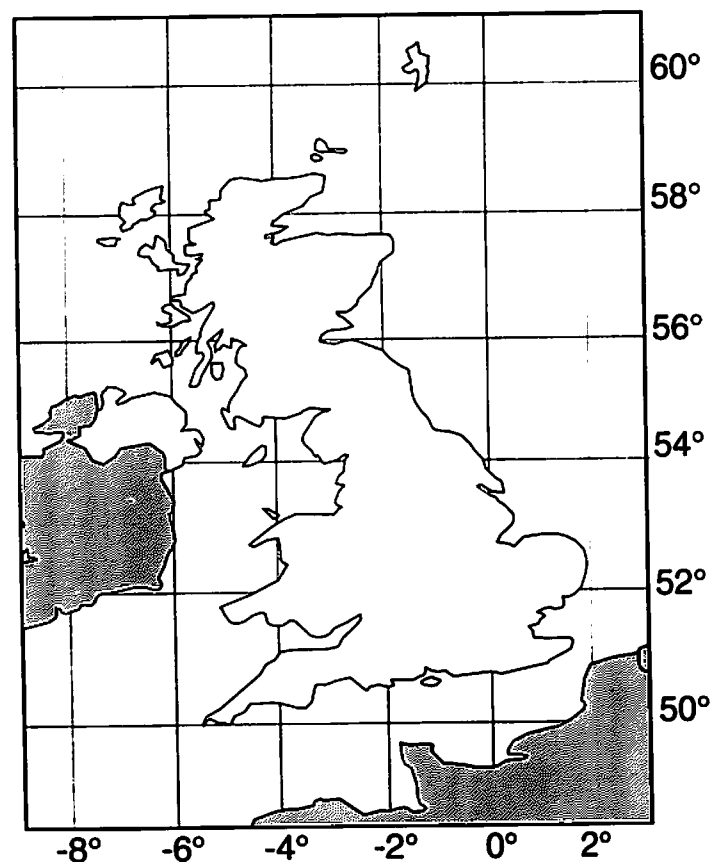


Fig. 6



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## PROGRAMMING

Note: This section should be used only for programming early OFF and early ON requirements. The following procedures apply to both single and dual channel variants.

### Understanding the early OFF/ON operation

Prior to programming your early OFF/ON operation please read the following notes carefully.

#### Notes:

1) The early OFF/ON function allows the user the ability to program a "break" in the maximum solar ON period. See Fig.7, page 15.

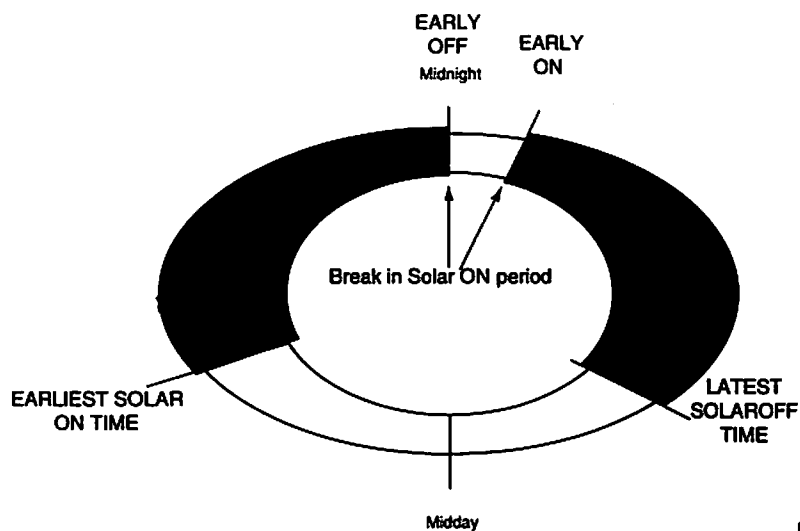


Fig. 7

2) The operation of the early OFF/ON can be compared with the contact switches on a round faced analogue timer. Moving the early OFF setting forward pushes the early ON setting forward, and moving the early ON setting backward pushes back the early OFF setting.

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3) For each geographical location there is a minimum solar ON period. If the early OFF time is set to a time before the solar ON time, the unit will not switch the application until the set time for the early ON operation. (unless the time is later than the solar OFF time).

4) For each geographical location there is a maximum solar ON period. The early OFF time may be set to approx. 10 minutes before the earliest solar ON time. The early ON time **must** be set before the latest solar OFF time. Failure to do so will result in non-operation of all solar functions.

Dual channel variants require the relevant channel to be selected prior to carrying out the programming procedures. Single channel variants do not require channel selection.

### Channel Selection

1. Select channel to be programmed:
  - a. Rotate front cover anti-clockwise and remove.
  - b. Press MODE button and repeat until PROGRAM is indicated on LCD. See Fig. 8, page 17.
  - c. To select channel 1, press "-" button. CH1 and current settings for selected channel are displayed on LCD.
  - d. To select channel 2, press "+" button. CH2 and current settings for selected channel are displayed on LCD.

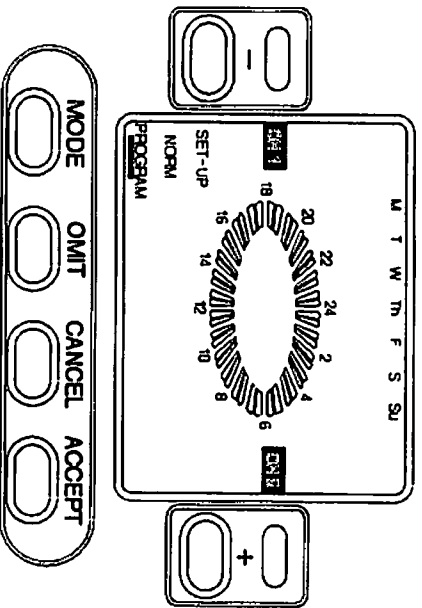


Fig. 8

**NOTES:**

- 1) EARLY and OFF are indicated on LCD and 12-hour digital clock is flashing.
- 2) Analogue program display indicates solar ON and solar OFF times for current date, geographical location and channel. The early OFF is indicated on the digital display.

**Setting Early OFF/ON**

1. Select early OFF time.
  - a. Press "+" or "-" button until desired early OFF time is displayed on 12-hour digital clock.

**NOTES:**

- 1) Pressing the "+" button increments the early OFF time by 15 minutes. Pressing and holding the "+" button increments the early OFF time at an increased rate.
- 2) Advancing the minute display from 45 to 00 increments the hour display by one hour. Advancing the hour display from 11 to 12 toggles the AM/PM indicators on the LCD.

2.

Select early ON time.

- a. To reject early OFF time just entered, press CANCEL button.
- b. Press ACCEPT button to store early OFF time in memory. EARLY and ON are indicated on LCD and 12-hour digital clock is flashing.
- c. On pressing the MODE button at this point will store the early OFF time only and return to NORMAL mode.

**NOTES:**

- 1) Analogue program display indicates solar ON/OFF and early OFF times for current date, geographical location and channel. The EARLY ON is indicated on the digital display.
- 2) Pressing the "+" button increments the early ON time by 15 minutes. Pressing and holding the "+" button increments the early ON time at an increased rate.
- 3) Advancing the minute display from 45 to 00 increments the hour display by one hour. Advancing the hour display from 11 to 12 toggles the AM/PM indicators on the LCD.
- 4) Pressing the "-" button decrements the early ON time by 15 minutes. The "-" button exactly mirrors the behaviour of the "+" button.

# SANGAM

- a. To reject early ON time just entered, press CANCEL button. System returns to early OFF procedure.
- b. Press ACCEPT button to store early ON time in memory. NORMAL mode is indicated on LCD.

## Omit day

1. Press MODE button and repeat until NORMAL is indicated on LCD.
2. Press OMIT button. Day name indicator is now flashing.

## NOTES:

- 1) The omit day facility is disabled above 66°N or below 66°S.
- 2) On pressing MODE at any point during the following procedure, the system returns operation to NORMAL mode.
3. Press "+" or "-" button until day of week marker is positioned below correct day name on LCD. See Fig.9, page 19.
4. If day sequence is enabled, press ACCEPT to disable all operation from solar ON time of selected day until solar ON time of following day.
5. If day sequence is disabled, press ACCEPT to enable all operation from solar ON time of selected day till solar ON time of following day.

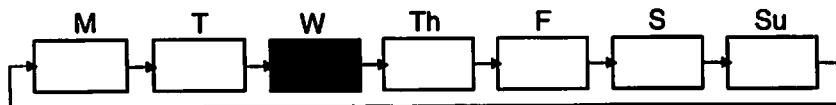


Fig. 9

# SANGAM

## REVIEW

The following procedures apply to both single and dual channel variants.

Dual channel variants require the relevant channel to be selected prior to carrying out the programming procedures. Single channel variants do not require channel selection.

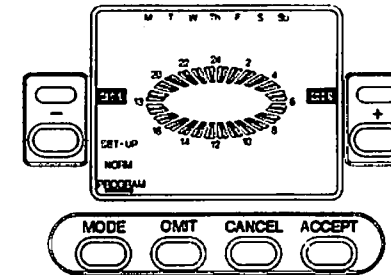


Fig. 10

## Channel Selection

1. Select channel to be programmed:
  - a. Rotate front cover anti-clockwise and remove.
  - b. Press MODE button and repeat until NORMAL is indicated on LCD.
  - c. To select channel 1, press "-" button. CH1 and current settings for selected channel are displayed on LCD.
  - d. To select channel 2, press "+" button. CH2 and current settings for selected channel are displayed on LCD.

## Viewing Early ON/OFF

### CAUTION:

TO PREVENT ACCIDENTAL LOSS OF PROGRAM SETTINGS, DO NOT USE THE "+" OR "-" BUTTONS WHILE REVIEWING PROGRAMS.

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1. Press MODE button and repeat until PROGRAM is indicated on LCD.
2. Select channel to be viewed, see Fig. 10, page 20:

## NOTES:

1) EARLY and OFF are indicated on LCD and 12-hour digital clock is flashing with early OFF time.

2) Analogue program display indicates solar ON/OFF and early OFF/ON times for current date, geographical location and channel.

3) Press ACCEPT button. EARLY and ON are indicated on LCD and 12-hour digital clock is flashing with early ON time.

4) Analogue program display indicates solar ON/OFF and early ON/OFF times for current date, geographical location and channel.

a. To return to early OFF procedure, press CANCEL button .

5) Press ACCEPT button to return to NORMAL mode. NORMAL mode is indicated on LCD.

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## HOLIDAY MODE

The system may be placed in holiday mode disabling all outputs for the duration of the holiday period.

1. Press and hold CANCEL button for a period of five seconds or more. Analogue program display is disabled and OFF is indicated on the LCD. 12-hour digital clock indicates time of day.
2. To exit holiday mode, press CANCEL button. Analogue display is enabled and NORMAL is indicated on the LCD.

## NOTE:

Entering holiday mode disables both channels for dual channel variants.

## POWER FAILURE MODE

During NORMAL operation, the system monitors the mains supply status. On detecting a mains supply failure, the system carries out the following actions:

1. LCD is disabled.
2. Output controls are disabled.
3. System enters WATCH mode.

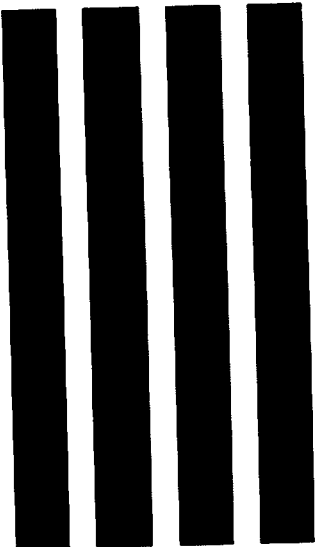
The system exits WATCH mode at regular intervals to monitor the mains supply status. On detecting the restoration of mains supply, the system checks programme settings in memory for signs of corruption (due to back-up battery failure). Should corruption be detected, system variables are set to default values. If no corruption is detected the system sets system variables to the values held in memory.

# SANGRAM

Schlumberger Electricity

The following default values are used if corrupted program settings are detected:

Time	01:00 AM
Date	Sunday 1st January 1995
Latitude	52°
Longitude	00°
Early ON time	12:00 AM
Early OFF time	12:00 AM



Schlumberger Electricity  
Industrial Estate, Port Glasgow, Renfrewshire  
PA14 5XG  
Scotland.  
Telephone: 01475 745131 Fax: 01475 744567

No. 143157

CE