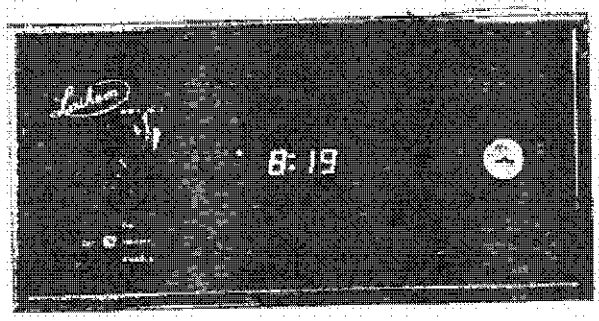
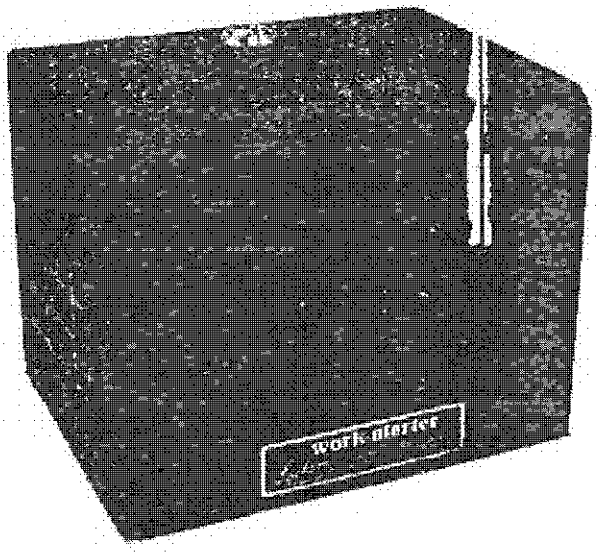
OPERATIONS MANUAL FOR THE DWA AND DWA-18-1

1989





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DESCRIPTION

The DWA and DWA-18-1 are equipped with a 10 ampere bell circuit controlled by a 4-bit microcomputer and has the following features:

1. 4 digit LED clock display showing hours and minutes in twelve hour format with a single LED for AM/PM indication.
2. Programmable daily and weekly bell operations including bell cutout operations.
3. 3 X 7" keypad for entry of bell schedule and clock display time.
4. Keypad recall of bell schedule for display.
5. Keypad erasure of bell schedule for easy changing.
6. Battery backup of program memory during A.C. power failures lasting up to three hours. The battery is automatically charged. NOTE: During power failure timekeeping on display will not advance and will require correction upon power resumption.
7. 50Hz or 60Hz clock synchronization. Clock accuracy defined by variation of the A.C. line frequency.
8. A three position toggle switch is located on the front panel of the DWA 18-1 for manual bells, inhibit bells and enable bells.

The DWA and DWA-18-1 are capable of retaining up to 18 bell events, including bell cutout operations, in solid state memory composed of two circuits (1 & 2). Circuit 1 retains daily and weekly bell operations while circuit 2 retains daily and weekly bell inhibition. When circuit 1 is programmed to change from "OFF" to "ON" or from "ON" to "OFF" the bell will sound. The bell program is repeatedly executed on a daily and weekly basis. Bell duration for the DWA is fixed at 5 seconds. Bell duration for the DWA-18-1 is adjustable from 1.5 seconds to 7.5 seconds by a potentiometer located on the back of its door assembly.

INSTALLATION AND SETTING INSTRUCTIONS

MOUNTING

The DWA can be set on a desk or shelf or mounted on a wall. A keyhole for mounting is located on the back of the DWA. Hang the unit on a screw through the keyhole and then tighten the screw. Insert screws through the other holes inside the unit to secure on wall.

The DWA-18-1 is intended for either surface or semi-flush wall mounting. Four holes are located on the back of the unit for securing to the wall. The cord is supplied unattached. Use a screwdriver to remove one of the knockouts and insert the cord into the unit. Wiring instructions are located on the door inside the unit. A two piece trim bezel is available at extra charge for semiflush mounting.

POWER UP

Mate the battery connector with the battery and then connect A.C. power. When power is initially applied, the clock display will come to 12:00PM on Sunday with memory circuits 1 & 2 "OFF" and no programs stored. If the line frequency is 60Hz, the clock setting is displayed immediately. If the line frequency is 50Hz, the [CLK] key must be pressed to start and display the clock. After power up the clock setting may be changed at any time. If for any reason the clock failed to initialize correctly at power up, initialization can be accomplished by pressing the [*] key. When powering down always disconnect both the battery and A.C. power.

SETTING THE CLOCK

Data is entered via the keypad located inside the unit. NOTE: The keypad for the DWA 18-1 is located on a hinged panel that opens with the door. Pull on the button marked "PULL TO ACCESS KEYPAD" to seperate keypad panel from door in order to gain access to keypad. A typical key sequence for setting the clock display would be

[MON] [WK] [AM] [7] [3] [0] [CLK]

which would start the clock at 7:30AM on Monday. The pattern for the key sequence is always the same. A day of the week is stored upon actuation of the [WK] key. An [AM] or [PM] key is pressed and the desired time entered, then the [CLK] key is pressed to start the clock. Because the display clock is not actually started from the new value until the [CLK] key is pressed, the digital clock may be synchronized with some other time base by setting the time one minute ahead and pressing the [CLK] key when the zero second occurs. The value of the display clock will be changed only if the key sequence is entered correctly; otherwise the [CLK] key returns the display to the previous value of the clock updated to the time the [CLK] key is pressed. Errors in the key sequence may also be corrected before the [CLK] key is pressed. Correction procedures are explained in the ERRORS section.

SETTING THE BELL PROGRAM (CIRCUIT NUMBER 1)

Be sure the front panel toggle switch on front of DWA 18-1 is in the enable position for bells to occur. A typical key sequence for daily and weekly bell operations would be

EXAMPLE 1:

[1] [CKT] [MON] [WK] [AM] [8] [0] [0] [ON]

which would ring bells at 8:00AM on Monday. As the key sequence is entered, the digital readout and LED indicators display the program settings. The entered program may remain on display without halting the operation of the clock; the clock runs and the bells operate regardless of the display status. Clock information may again be displayed by pressing the [CLK] key.

If the circuit number or day of the week for the next program entry differs from its predecessor, then the above key sequence must be repeated in its entirety with the new parameter. If the circuit affected and the day of the week are the same, a shortened key sequence suffices to store the program. An example of the shortened key sequence would be

EXAMPLE 2:

[1]	[CKT]	[EDAY]	[WK]	[AM]	[8]	[0]	[0]	[ON]
				[PM]	[1]	[2]	[0]	[0]	[OFF]
				[PM]	[1]	[0]	[0]	[ON]
				[PM]	[5]	[0]	[0]	[OFF]

which would ring bells at 8:00AM, 12:00PM, 1:00PM and 5:00PM each day of the week.

Note in the above example each entry is alternately terminated with the [ON] and [OFF] key. This is because the bell circuit operates on state transitions of circuit 1 memory (from ON to OFF or from OFF to ON). Due to this fact, an even number of program entries must be made for each repeating daily or weekly cycle. If an odd number of entries is required, then make an extraneous entry and inhibit its operation using circuit 2 as shown in example 4.

Circuit number 2 is programmed to inhibit bells. A typical example for weekend bell inhibition would be

EXAMPLE 3:

1	CKT	EDAY	WK	AM	8	0	0	ON	
				AM	1	1	3	0	OFF
				PM	1	2	3	0	ON
				PM	5	0	0	OFF	
2	CKT	SAT	WK	AM	1	2	0	0	ON
2	CKT	SUN	WK	PM	1	1	5	9	OFF

which would ring bells at 8:00AM, 11:30AM, 12:30PM and 5:00PM Monday through Friday. Bell operations during Saturday and Sunday are inhibited by circuit 2 which is "ON" from 12:00AM Saturday until 11:59PM Sunday. Bell operations are inhibited when circuit 2 is ON.

As another example suppose bells are to ring at 8:00AM, 12:00PM and 5:00PM Monday through Friday. Since only an odd number of bells is required each day, an extraneous entry will have to be made and its operation inhibited as shown below

EXAMPLE 4:

1	CKT	EDAY	WK	AM	8	0	0	ON	
				PM	1	2	0	0	OFF
				PM	5	0	0	ON	
				PM	5	0	5	OFF	
2	CKT	EDAY	WK	PM	5	0	4	ON	
				PM	5	0	6	OFF	
2	CKT	SAT	WK	AM	1	2	0	0	ON
2	CKT	SUN	WK	AM	1	2	0	0	ON

In this example the extraneous bell programmed for 5:05PM each day would be inhibited since circuit 2 would be "ON" between 5:04PM and 5:06PM each day. On Saturday and Sunday circuit 2 would turn "ON" at 12:00AM and "OFF" at 5:06PM. Had circuit 2 not been programmed to turn "ON" at 12:00AM on Sunday, then circuit 2 would be "OFF" from 5:06PM Saturday until 5:04PM Sunday and all three bells would have sounded on Sunday.

NOTE: The lower LED of the two top left LED's indicates whether the last program entry was terminated with the ON or OFF key and is a useful aid when programming bells. The LED will turn "ON" when a bell program entry is terminated with the ON key. The next key pressed following the ON key will cause the LED to turn "OFF".

ERRORS

The usual error indication is 99:99 on the display. This occurs if the key sequence is incorrect or if a program is attempted with an invalid time. The indication 88:88 on the display occurs if an attempt is made to store more than 18 program entries.

In the event an error indication of 99:99 is displayed, press CLR CLK to return the display to the previous clock setting and start again.

During program input, errors may be corrected by several methods. Depressing the CLK key will display the current clock setting without storing in memory any bells not yet terminated with the ON or OFF key. The CLR key clears the display, and may, therefore, be used to clear the errors before a program is stored. When more than 4 digits are entered from the keypad, the leftmost digit is rolled off the display. Only the digits shown on the display when a key sequence is completed will be stored upon actuation of the ON or OFF . Another means for correcting errors is simply to start the entire process over from setting the clock to programming circuits 1 and 2. To clear all data, press the initialization key * . Actuating the * will clear memory, turn off circuits 1 & 2 and initialize to 12:00PM Sunday as in the power up process.

PROGRAM REVIEW

The programs stored in memory can be displayed by pressing the CKT key twice per data entry. For example, the key sequence

EXAMPLE 5:

1 CKT CKT . . . CKT CKT

displays the bell schedule for circuit 1. One time data entry is displayed for every two times CKT is pressed.

EXAMPLE 6

2 CKT CKT . . . CKT CKT

displays the bell innibit schedule on circuit 2 (bell inhibit). The programs stored for a particular day of the week are displayed in the same manner but using the WK . For example:

EXAMPLE 7

WED WK WK . . . WK WK

Programs entered with the EDAY key are displayed using that key and WK . For example

EXAMPLE 8

EDAY WK WK . . . WK WK

This sequence only displays program entries originally entered with EDAY . Programs entered on a specific day of the week must be displayed with the key corresponding to that day.

When a program is displayed, the digital readout shows the programmed time. The lower LED of the two top left LED's shows the "ON"/"OFF" state and the LED immediately to the left of the hours' readout indicates AM/PM. The AM/PM LED being "ON" indicates PM. When the clock is displayed, the top left LED displays the "ON"/"OFF" state of circuit 1. The top left LED being ON when circuit 1 is "ON".

MANUAL STATE CHANGING OF CIRCUITS 1 AND 2

The state of circuits 1 and 2 may be changed by pressing the CKT key then the ON or OFF key. As an example, circuit 1 is turned "ON" as follows:

EXAMPLE 9

1 CKT ON

If circuit 1 makes a state transition at this time and circuit 2 is "OFF", then the bells will ring. As another example, bells can be manually inhibited by turning circuit 2 "ON" as follows:

EXAMPLE 10

2 CKT ON

A switch, located on the front of the DWA 18-1, provides another means for manually ringing bells. Bells will ring when this switch is "UP" regardless of the ON/OFF state of circuit 2. When the switch is in the INHIBIT (center) position, the bells will not operate; and when the switch is in the ENABLE (down) position, the bells will operate as scheduled.

PROGRAM DELETE

The memory may be cleared entirely or selectively using the MEM CLR key. This key clears everything stored in memory and turns off circuits 1 and 2. The programs for an individual circuit or day may also be cleared without disturbing other stored programs.

EXAMPLE 11

1 CKT MEM CLR

is an example of a key sequence for deleting all program entries for circuit 1. Another example:

EXAMPLE 12

THU WK MEM CLR

would delete the program entries stored specifically for Thursday. Programs stored specifically with the EDAY key are cleared using that key in place of a day of the week key as follows:

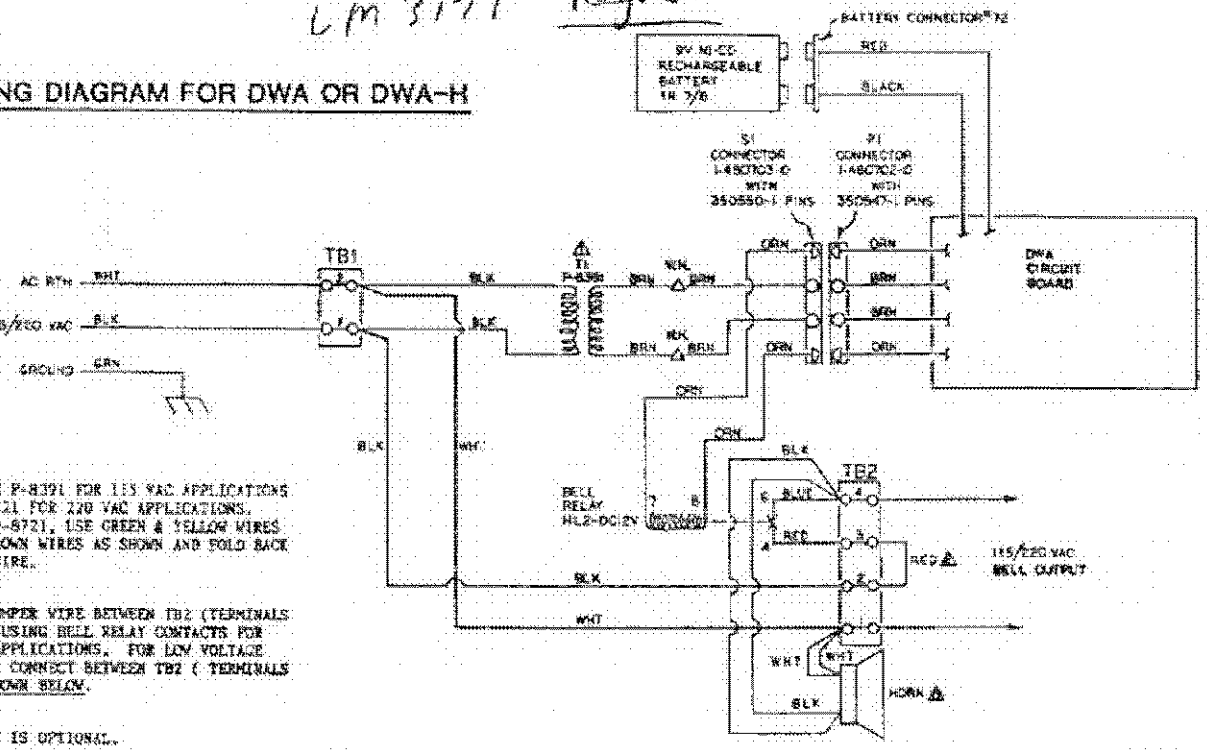
EXAMPLE 13

EDAY WK MEM CLR

NOTE: After an entry has been registered upon actuation of the ON or OFF key, the entry can only be corrected by clearing the program stored for that day or for that circuit and re-enter the program.

LM 317T Regulator

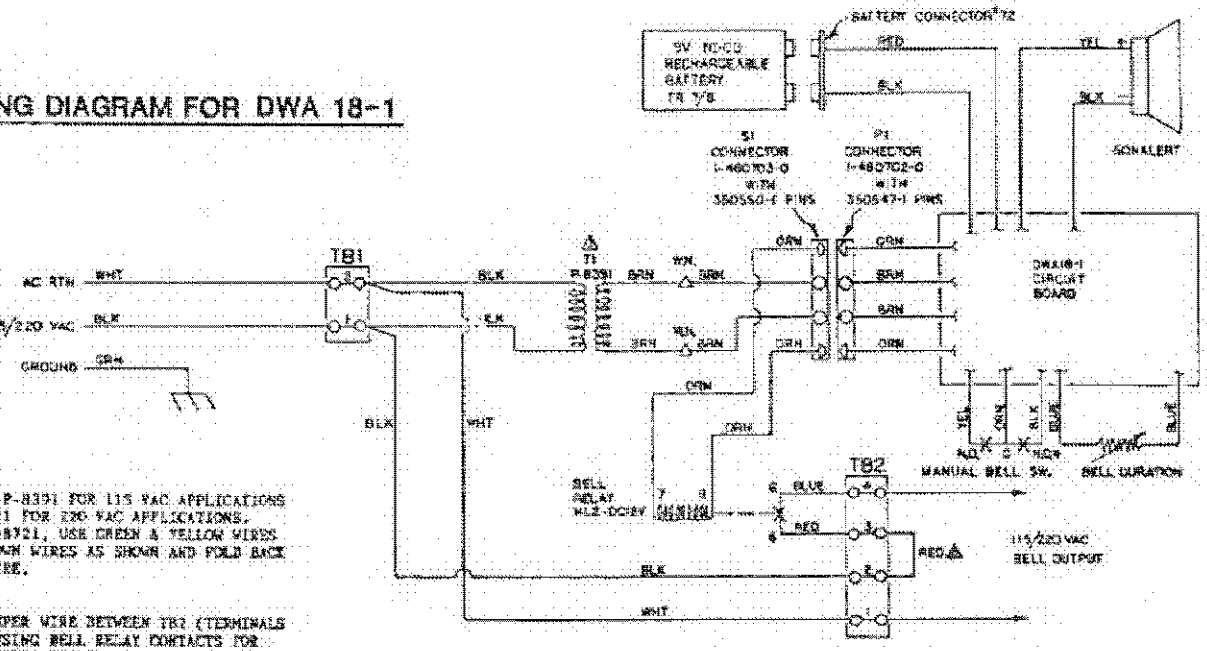
WIRING DIAGRAM FOR DWA OR DWA-H



NOTES:

1. T1 TO BE TYPE P-8391 FOR 115 VAC APPLICATIONS AND TYPE P-8721 FOR 220 VAC APPLICATIONS. WHEN WIRING P-8721, USE GREEN & YELLOW WIRES IN LIEU OF BROWN WIRES AS SHOWN AND FOLD BACK SPARE GREEN WIRE.
2. REMOVE RED JUMPER WIRE BETWEEN TB2 (TERMINALS 2 & 3) WHEN USING BELL RELAY CONTACTS FOR LOW VOLTAGE APPLICATIONS. FOR LOW VOLTAGE APPLICATIONS, CONNECT BETWEEN TB2 (TERMINALS 3 & 4) AS SHOWN BELOW.
3. INTERNAL HORN IS OPTIONAL.

WIRING DIAGRAM FOR DWA 18-1



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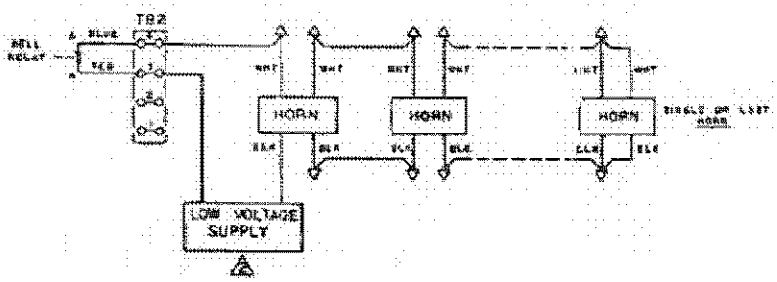
WIRING FOR LOW VOLTAGE



NOTES:

1. INSURE RED JUMPER WIRE IS REMOVED FROM BETWEEN TB2 (TERMINALS 2 & 3).
2. UNIT DOES NOT HAVE A LOW VOLTAGE SUPPLY AND MUST BE PROVIDED AND CONNECTED AS SHOWN.