

Large Display Digital Alarm Clock

This digital clock is an ideal option for use in homes, shops, offices, etc. The circuit is based on the National Semiconductor Microelectronics chip which is one of the most recent clock chips and incorporates a wide range of features such as alarm, snooze, 24 hour timer (a relay can be connected to the PCB). The display is made up of a discrete array of 87 LEDs with digits measuring 2" (50 mm) high.

Step-by-step Assembly

Refer to the corresponding guide in the **General Assembly Guide** included with the kit for detailed instructions on installation of each component.

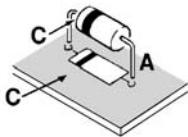
1 Resistors:

<input type="checkbox"/> R1, R2, R4, R6, R7, R8 R9, R10, R11	47 Ω	Yellow, Violet, Black
<input type="checkbox"/> R3, R12	1 K Ω	Brown, Black, Red
<input type="checkbox"/> R5, R19	220 Ω	Red, Red, Brown
<input type="checkbox"/> R13, R14	4.7 Ω 1/2W	Yellow, Violet, Gold
<input type="checkbox"/> R15	100 K Ω	Brown, Black, Yellow
<input type="checkbox"/> R16	2.2 K Ω	Red, Red, Red
<input type="checkbox"/> R17	240 K Ω	Red, Yellow, Yellow
<input type="checkbox"/> R18	560 K Ω	Green, Blue, Yellow
<input type="checkbox"/> R20	1.5 K Ω	Brown, Green, Red
<input type="checkbox"/> R21	2.4 K Ω	Red, Yellow, Red
<input type="checkbox"/> R22	100 Ω	Brown, Black, Brown



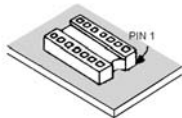
2 Rectifier, Signal and Zener Diodes:

<input type="checkbox"/> D1, D2, D3	1N4002/4
<input type="checkbox"/> D4	1N4148 or 1N914
<input type="checkbox"/> D5	A39 (red body)
<input type="checkbox"/> D6	3.9V



3 IC Socket:

- Install the 28-pin IC socket at location marked "U1". It is recommended that the notched end be aligned with the outline on the PC board. Please be careful when soldering the pins in order to avoid causing solder bridges causing shorts between pads.



4 Push Button Switch:

- SW1, SW3, SW4, SW5 Push button switch

5 Transistors and 3-pin CMOS Integrated Circuit:

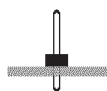
<input type="checkbox"/> Q1	UM66T19L (integrated circuit)*
<input type="checkbox"/> Q2, Q3	C945 (transistor)

* This IC is packaged inside the aluminum foil.



6 Terminals:

- Install the 9 terminals at locations marked "A1", "A2", "G", "BAT", "SPK" and "REL".



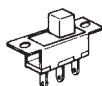
7 Polyester & Ceramic Disc Capacitors:

<input type="checkbox"/> C2	102/0.001 μ F / 1 nF
<input type="checkbox"/> C3	103/0.01 μ F / 10 nF



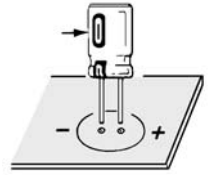
8 Slide Switch:

- SW2 SPDT slide switch



9 Electrolytic Capacitors:

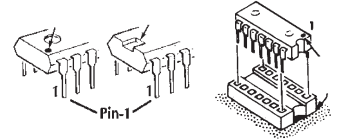
<input type="checkbox"/> C1	1000 μ F / 25 V*
<input type="checkbox"/> C4	47 μ F / 10 V
<input type="checkbox"/> C5	100 μ F / 16 V
<input type="checkbox"/> C6	0.47 μ F / 50 V
<input type="checkbox"/> C7	0.22 μ F / 16 V



- * It is recommended to install this capacitor on the back side (solder side) of the PC board so that it lies flat on its side. You can then solder the leads on the component side of the PC board.

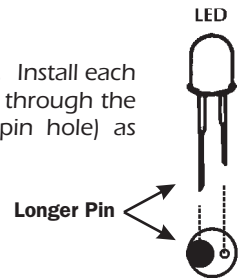
10 CMOS Integrated Circuit:

- Insert the LM8560 integrated circuit into its corresponding socket at location marked "U1".



10 Light Emitting Diodes:

- Install the 87 LEDs on the display board. Install each LED so that the **longer pin** is inserted through the hole marked with a solid circle (left pin hole) as indicated in the figure at right.



Testing

Before testing the kit, it is highly recommended to inspect the PC boards carefully as explained below:

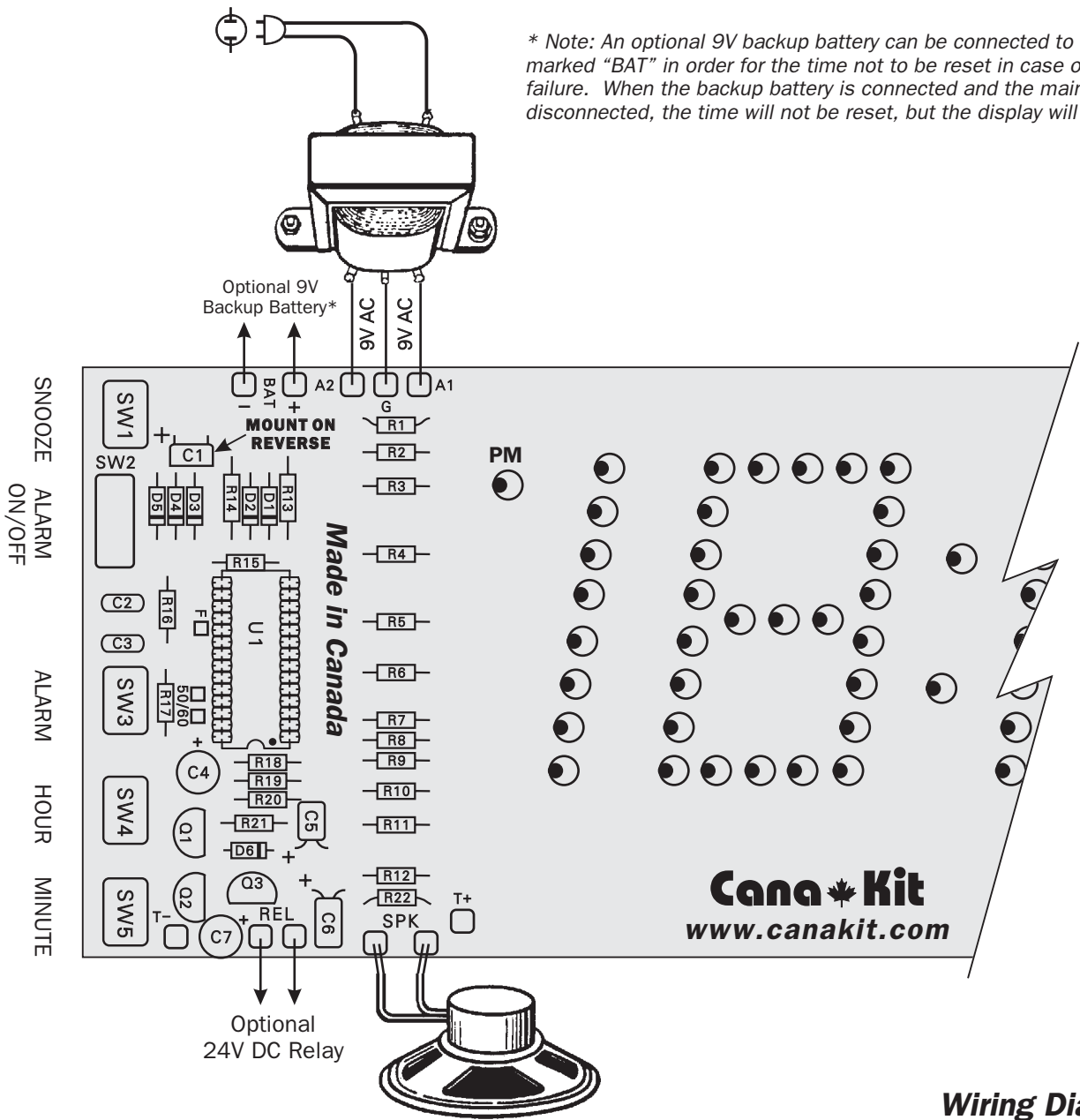
- Check for proper placement of all components.
- Check for proper orientation of integrated circuits, transistors, LEDs and electrolytic capacitors.
- Check IC pins to see that they are not folded under.
- Check for protruding leads which could touch other leads or adjacent pads.
- Check all solder connections for cold solder joints.
- Examine the PC board solder side to see that there are no solder bridges causing shorts between tracks.

Once you are satisfied that everything is correct, proceed to do the test as follows: (Refer to wiring diagram.)

1. Connect an 18V AC C.T. (2 x 9V AC) / 300mA transformer to the main board as shown in the **wiring diagram**. Note that the centre wire must be connected to the point marked "G".
2. Now the display board should be illuminated indicating a flashing "12:00".
3. You can adjust the time by using the two buttons "SW4" and "SW5" for hour and time adjustment respectively. In order to use the alarm feature of the clock, connect a small speaker to the points marked "SPK". To set the alarm, simultaneously push buttons "SW3" and "SW4" for hour adjustment and "SW3" and "SW5" for minute adjustment. To activate the alarm use the slide switch "SW2" (the alarm LED will turn on). At the preset alarm time, you will hear a melody through the speaker until the snooze switch "SW1" is pushed or the slide switch is moved to the "OFF" position. The snooze function will sound the alarm again in 9 minutes.
4. If you are going to use the clock as a timer, simply connect a 24V relay to the points marked REL. The relay will be activated at the preset alarm time for 2 hours or until "SW1" is pushed or the slide switch is moved to the "OFF" position.

Note: If the frequency of the line in your country is **50Hz**, then you must place and solder a jumper between the two points marked "50/60" (above "R17"). For **60Hz** operation, this points should be left open.

* Note: An optional 9V backup battery can be connected to the points marked "BAT" in order for the time not to be reset in case of a power failure. When the backup battery is connected and the main power is disconnected, the time will not be reset, but the display will remain off.



Wiring Diagram

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