

# Boulder

NIXIE TUBE CLOCK  +  = 

## User Guide of NIXIE TUBE CLOCK-Boulder



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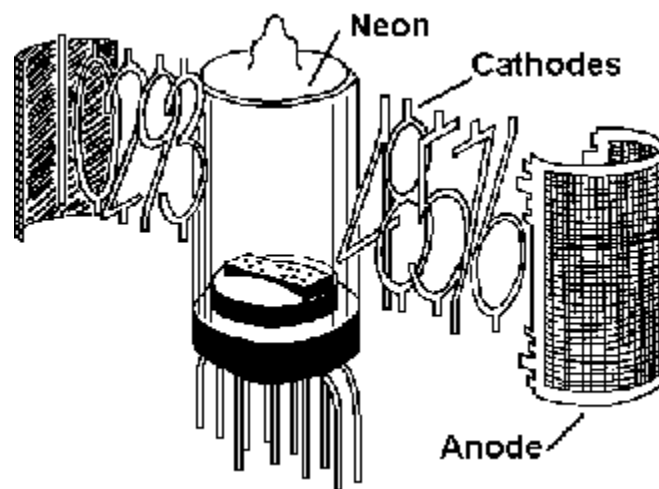
### 1. Introduction

#### HISTORY OF THE NIXIE TUBE

Nixie tubes were originally developed in 1952 by the Haydu brothers for the Burroughs Corporation as the precursor to the computer monitor. From the early 1950's to the 1970's Nixie tubes were the dominant display service. Later they were supplanted by LED displays and are quite rare today! They found their way into everything from test equipment over early computers to aerospace. While LED's are technically more advanced, their aesthetics leave something to be desired. A Nixie's digits consist of ten thin metal electrodes that are individually formed and can easily incorporate uneven curves and skew lines. The only technical flaw is based on the fact that the digits are stacked in front of each other; this causes tiny gaps where they are shadowed by the digits in front of it. Ironically, they were hardly used as clock displays. Over recent years their popularity has increased dramatically due to their unusual appearance and historical value. In essence they are like miniature neon signs with a warm, comforting orange/violet glow. Nixie clocks have become very popular as a way to bring these devices 'out of the dark'.

#### HOW THE NIXIE TUBE WORKS

Each glass tube typically contains 10 or more individual cathode wires in the shape of numbers or letters. The cathodes are stacked so that different numerals appear at different depths, unlike a planar display in which all numerals are on the same plane relative to the viewer. The anode is a transparent metal mesh wrapped around the front of the display. The tube is filled with the inert gas neon (and other gases) with a small amount of mercury. When an electric potential of 120 to 180 volts DC is applied between the anode and any cathode, the gas near the cathode breaks down and the digit spreads it's wonderful glow.



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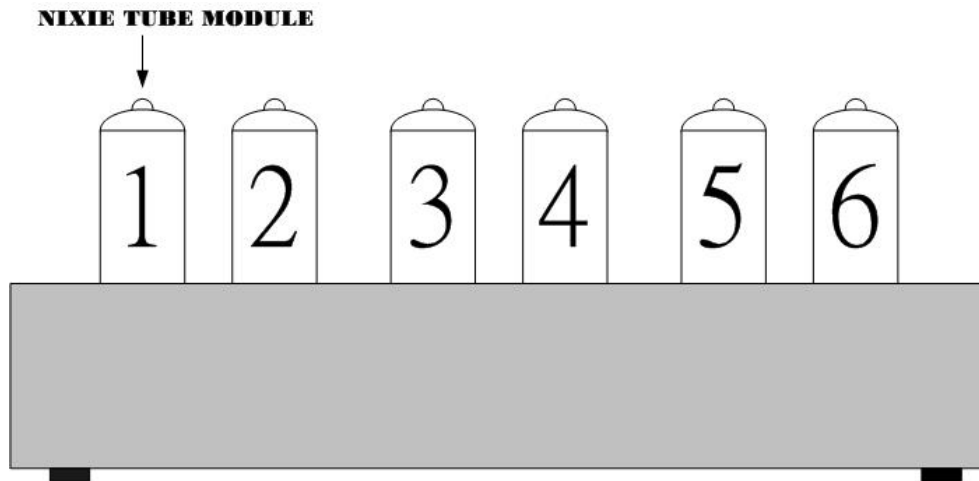
### 1.1 Technical data

Feature	Specification
Function	Time: HH:MM:SS 12Hr/24Hr Mode Date : YY:MM:DD Cross Function: (1) Cross Left (2) Cross Right (3) Random Type Fade Mode ON/OFF Three Types of Date Format: (1) YY/MM/DD (2) MM/DD/YY (3) DD/MM/YY Real Time Clock Time/Date Counter. Time/Date Keep When Remove DC Power Adapter.
<b>Hardware</b>	
Power Supply	DC 12V/1A Adapter 5.5mm Jack, Positive Inner.
Power Consumption	Depend On Tubes With Middle Size (ex.IN-8-2) DC 12V/250ma 3W
Nixie Tubes Module	NIXIE TUBE CLOCK BOULDER is Type for Middle Size Nixie Tube Module Designed by PIXEL DESIGN. Easy to Change Tube Module.
Tubes connector	4P X 3 for One Tube Module. For Easy to Change Broken Tube Module.
Battery	Lithium, 3V, CR2032 type. For Real-Time-Clock Time/Date Keep.
Setting	3 Pushbuttons Onboard To Adjust Time/Date/Function
Dimensions	(W.L.H):180mm x 72mm x 35mm (W.L.H):180mm x 72mm x 80~90mm(With different Tube Module)

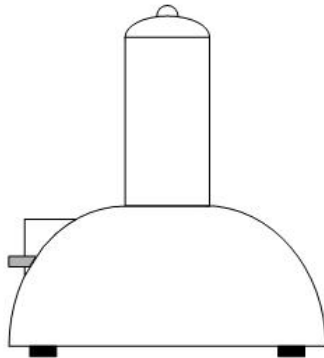


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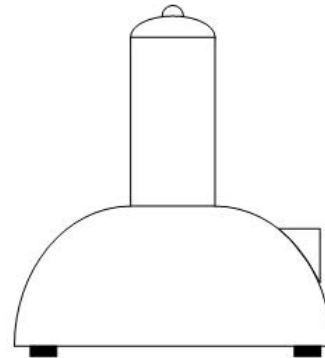
## 1.2 Block Diagram of Tube Clock



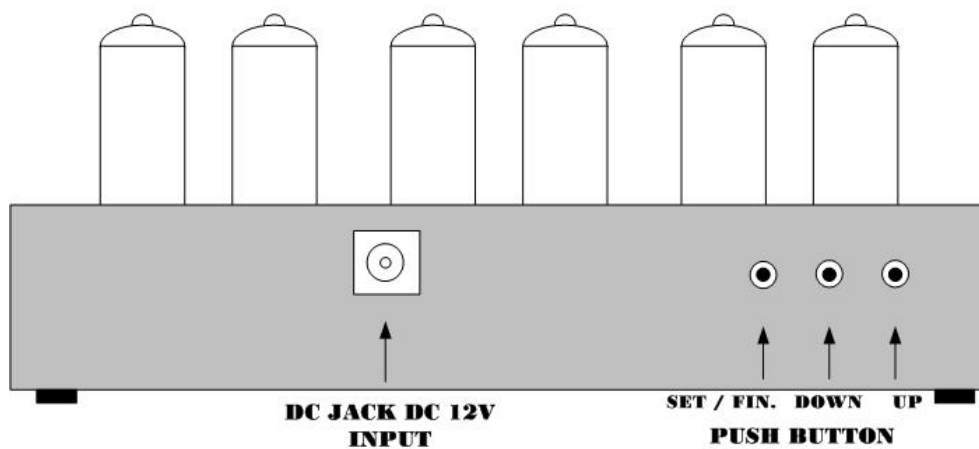
**FRONT VIEW OF NIXIE TUBE CLOCK**



**Left side view**



**Right side view**



**BACK VIEW OF NIXIE TUBE CLOCK**

## User Guide of NIXIE TUBE CLOCK Boulder

### 2. Function

NIXIE TUBE CLOCK BOULDER By PIXEL DESIGN is a product to display exact time and date with beautiful NIXIE TUBE. After setting correct time/date, clock will display correct time HH:MM:SS, and automatic display date YY:MM:DD in 50sec per minute.

#### 2.1 R.T.C(Real-Time-Clock)

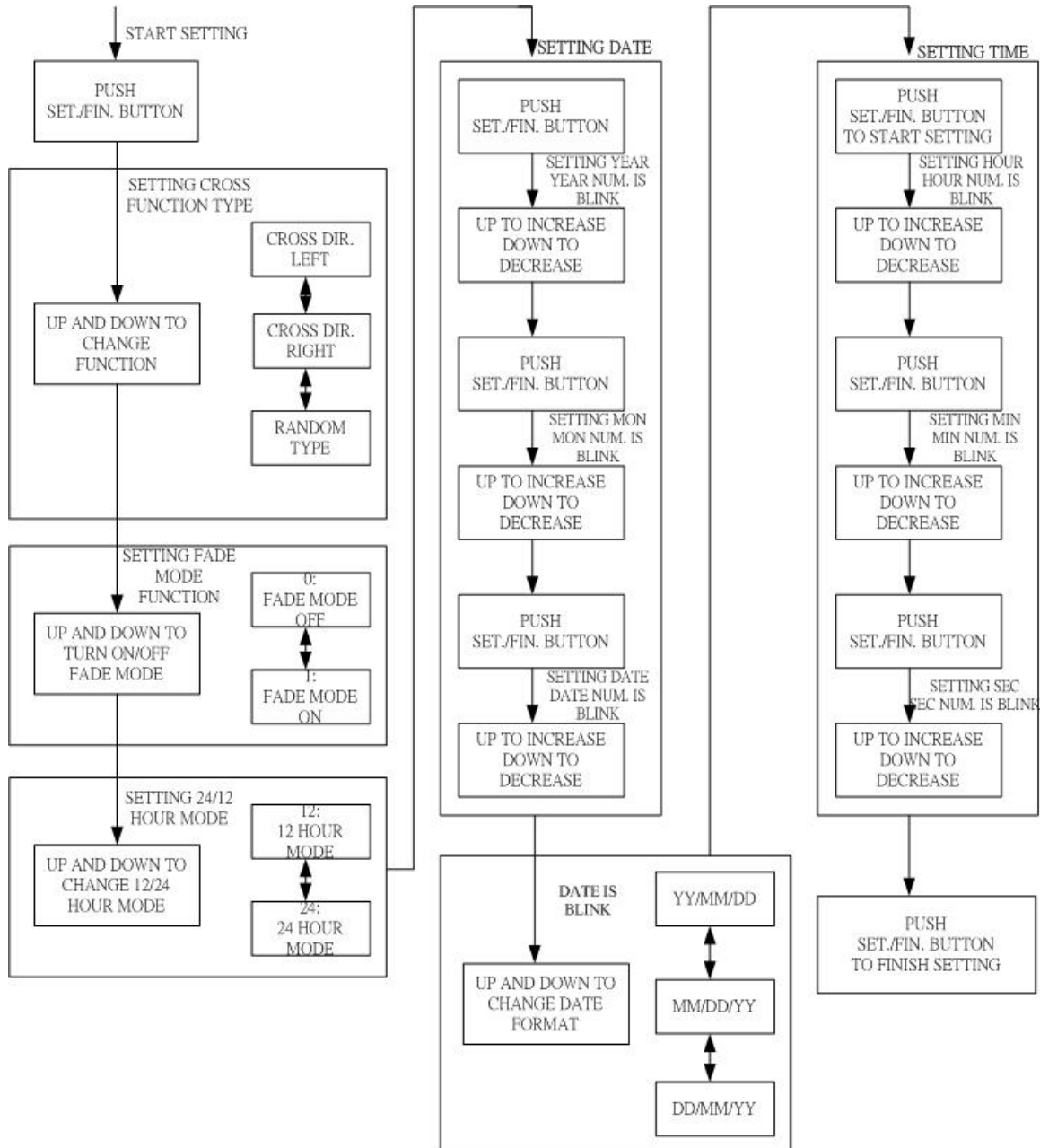
R.T.C (Real-Time-Clock) is used in NIXIE TUBE CLOCK BOULDER by PIXEL DESIGN. 3V Li battery supply is needed for correct RTC functionality and storing time data in case of a power failure. The life time of Li Battery will up to ten year.



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### 2.2 Setting Function/Time/Date

Before user will start to use this clock, setting correct time and date is necessary. Setting flow is follow:

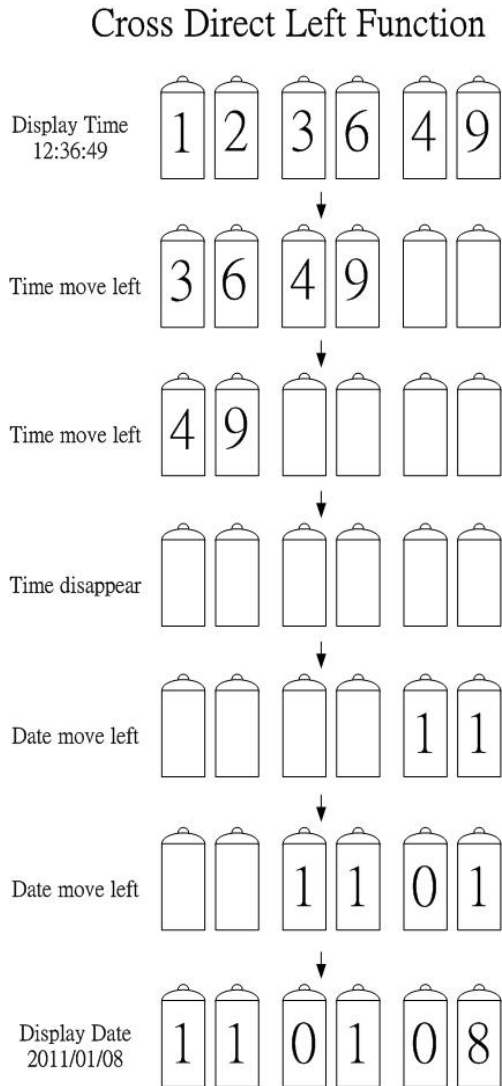


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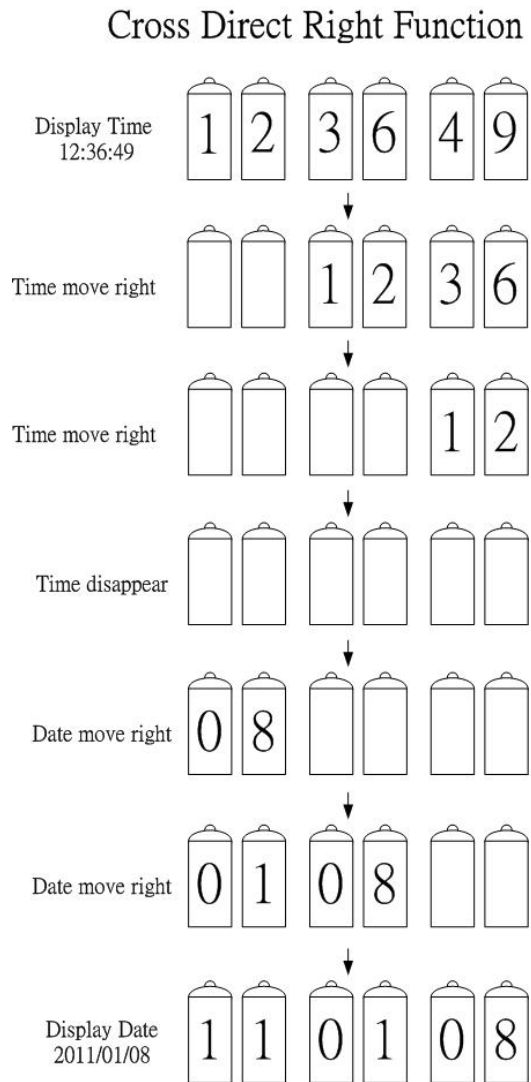
### 2.2.1 Cross Function

Cross Function is a special purpose to show nixie tube between display time and date in 50sec per minute.

#### (1) Cross Dir. Left



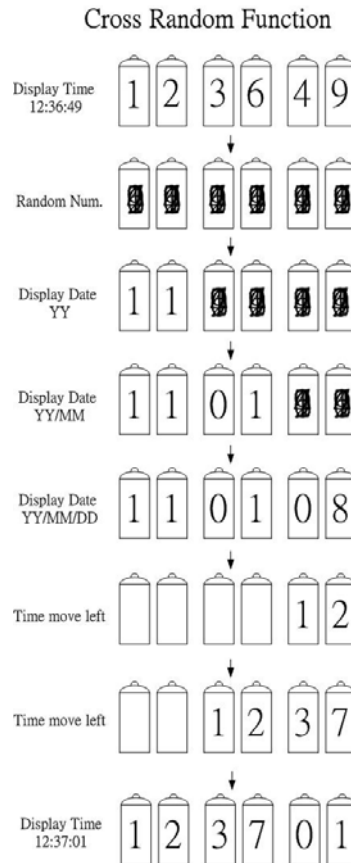
#### (2) Cross Dir. Right





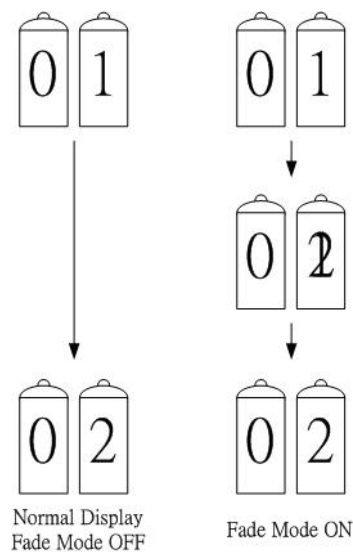
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### (3)Random Type



### 2.2.2 Fade mode

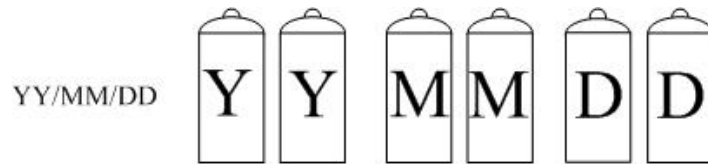
Fade mode provides a special display function for interest of user.



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### 2.2.3 Date Format

We also provide three types of date format function for worldwide user's habit.  
(YY: YEAR / MM: MONTH / DD: DAY)



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### 2.3 Power

DC 12V 1A Full range 50/60Hz 110/220V adapter is included with NIXIE TUBE CLOCK BOULDER.

**Notes:** There is a little "warm" on the controller main body when product works. The temperature is about 30-40°C. It's normal condition. Please use relieved.

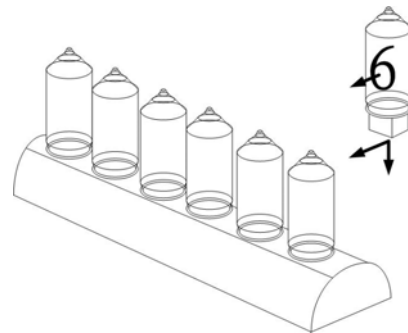


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### 3. Nixie Tube Module

Nixie Tube Module is designed by PIXEL Design for NIXIE TUBE CLOCK BOULDER Type for easy change decrepit tube without soldering.

**Notes:** When tube plug in the connecter safety and work several mins, the tube will work static.

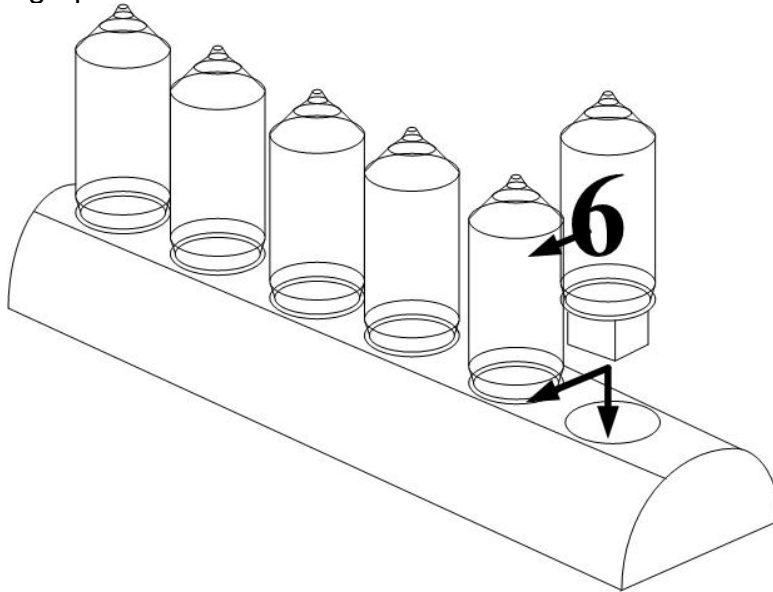


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### 4. Operates the Clock

Please check follow points before this clock works.

- (1) To Plug all six nixie tube modules into the tube hole on the nixie tube clock main body. And checks all the tube modules are in the correct seat as follow photograph.



- (2) To plug the power adapter DC plug into the DC JACK on back of the Nixie Tube main body.



- (3) Please check the AC plug type before plug the power adapter AC plug into the wall connector.  
When the AC plug is different with include type, please use transfer plug or self DC 12V/500ma adapter.

**Grounded Adapter Plugs Available for Worldwide Travel:**

	<b>NWG-1C:</b> CONTINENTAL EUROPE (NOT ITALY OR SWITZERLAND)
	<b>NWG-2C:</b> AUSTRALIA, FIJI, NEW ZEALAND AND CHINA
	<b>NWG-3C:</b> NORTH/SOUTH AMERICA, JAPAN, CHINA, TAIWAN, AND THAILAND
	<b>NWG-135C:</b> GREAT BRITAIN, IRELAND, SINGAPORE, HONG KONG AND MALAYSIA
	<b>NWG-11C:</b> ITALY
	<b>NWG-12C:</b> ISRAEL
	<b>NWG-13C:</b> SOUTH AFRICA
	<b>NWG-14C:</b> INDIA, PARTS OF SOUTH AFRICA/HONG KONG/SINGAPORE

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(4) The red light LED on the DC12V adapter will light, when the AC plug plugs correctly into the wall plug.



(5) Enjoy using the Nixie Tube Clock.

## 5. Safety Instructions

The tubes operate with a 170V (DC). This electrical voltage is dangerous to come in contact with! This high voltage of 170VDC is generated **inside** the clock. There is a **RISK OF ELECTRICAL SHOCK!** **Do not** remove any parts of the housing or a tube while the clock is connected to the power supply.

If one of the tubes is broken or damaged, immediately pull the power plug out of the clock and contact the customer support.

The tubes are made of glass and are consequently very easy to break. Because of their fragility, it is important that you keep the clock in a safe place free from the possibility of being struck inadvertently.

**Water and Moisture:** The clock should be kept in a dry room free from humidity and dust. The clock should not be used near water – for example, near a bath tub, washbowl, kitchen sink, laundry tub, in a wet basement, near a swimming pool, in a sauna, etc. In addition the clock should be kept out of direct sunlight and high temperatures.

This clock is not a toy! Keep this clock out of the reach of children.

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