

**BACKGROUND AND SCIENTIFIC DESCRIPTION**

A professor of physics at the University of Padua in Spain, Alessandro Volta (1745-1827) is credited with the invention of the electric cell. It was on March 20, 1800 that he sent a letter to the Royal Society of London describing a revolutionary discovery. He had stacked a zinc disk and a copper disk, with a leather disk in between. The leather disk had been soaked in a mild acid solution of lemon juice. Volta found that a small flow of electrical current between the copper and the zinc resulted. Thus was born the "voltaic pile" or electrical storage battery.

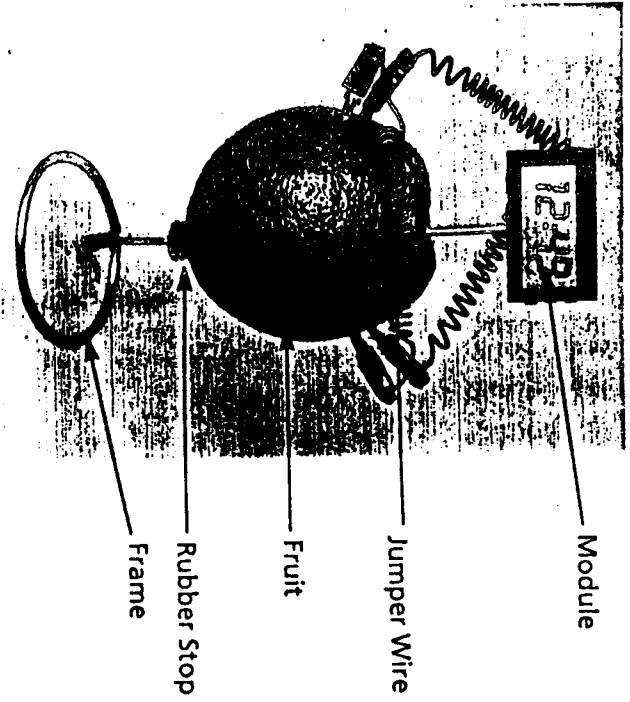
There are different kinds of batteries, but they all work on the same general principle. Several different acid solutions are used. These solutions are called electrolytes. They allow current to flow through them because they contain many charged atoms, known as ions. In a dry-cell battery, like the one used in a flashlight, the electrolyte is not really dry but mixed with a paste of absorbent material.

Volta discovered that, when two dissimilar metals are separated by a conducting liquid, electrons flow from one metal to the other through the liquid. The metal less acted upon accumulates electrons. If the two poles are connected, a flow of electricity—or current—results. Even though Volta did not know why his discovery worked, his contribution is one of the most important in the history of electrical science. This discovery in 1800 was the forerunner of the primary cell, which delivers an electrical current as the result of an electrochemical reaction. The volt, our unit of electrical force, is named in honor of Alessandro Volta.

The metals used in a dry-cell battery are usually copper and zinc. These materials are called the electrodes. The electrical force that we call current (measured in volts) is generated because a chemical reaction causes the copper electrode to develop a shortage of electrons. At the same time the zinc electrode develops an over-supply of electrons. When the two are connected, a flow of electrons from the zinc to the copper electrode results. By inserting a device that is powered by a flow of electrons between the two electrodes, we can use the resulting "battery" to do useful work.

Your FRUIT POWERED CLOCK and CALENDAR takes advantage of Volta's original design to provide accurate digital time and date information from a micro-electronic device powered by the flow of electrons between a copper and a zinc electrode. A fruit or vegetable provides the acid paste, or electrolyte.

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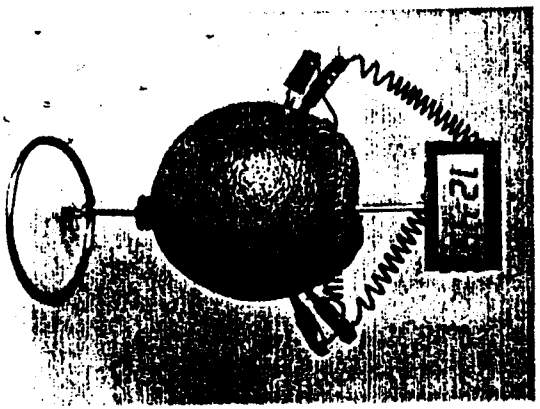


**PARTS OF THE FRUIT POWERED CLOCK**  
ENJOY THE POWER OF FRUIT TODAY!

Made in Hong Kong  
© 1993 Schopf Design Associates  
Ipswich, MA 01938  
P.O. Box 587  
Above Run from Schylling

FRUIT NOT INCLUDED

**THE TIME IS RIPE!**  
DIGITAL CLOCK AND CALENDAR  
THE ULTIMATE IN ENVIRONMENTALLY RESPONSIBLE POWER



**FRUIT  
POWERED  
CLOCK**

**THE TIME IS RIPE!**  
DIGITAL CLOCK AND CALENDAR  
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DIGITAL CLOCK AND CALENDAR

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## INSTRUCTIONS FOR INSTALLING THE FRUIT BATTERY

For your convenience THE TIME IS RIPE has packaged your FRUIT POWERED CLOCK with a FOAM BALL where the FRUIT should be placed. Look carefully at the assembly to see where the electrodes will be placed in the FRUIT. The copper electrodes are RED and the zinc electrodes are BLACK. When the red and black electrodes are inserted about 1/4" apart, that pair of electrodes forms a simple battery. Two such pairs of electrodes are required to power your FRUIT POWERED CLOCK and CALENDAR.

There are FOUR major parts to the CLOCK and CALENDAR:

- A. The Electronic Module with attached Electrodes
- B. The Jumper Wire with attached Electrodes
- C. The Wire Frame and Base
- D. The FRUIT (Foam Ball)

Look again carefully at the Clock as it is assembled with the Foam Ball where you will put the Fruit. The Electrodes that are attached to the Electronic Module are placed as far apart as possible in the Fruit. The Jumper Wire is installed so that each electrode is about 1/4" from the Electrode of the Module. THE ELECTRODES SHOULD BE INSTALLED SO THAT ONE RED AND ONE BLACK FORM EACH PAIR. THEY MUST BE CLOSE TOGETHER (about 1/4") BUT NOT TOUCHING.

### DETAILED STEPS FOR ASSEMBLY

1. Remove the Electrodes from the Foam Ball.
2. Remove the Electronic Module from the top of the wire frame.
3. Install the Fruit by removing the Foam Ball and stabbing the Fruit onto the Wire Frame.
4. Adjust the height of the Fruit by moving the rubber stop up or down until about 1 1/4" of the Wire Frame is showing above the Fruit.
5. Replace the Electronic Module by inserting the end of the Wire Frame in the mounting hole at the back of the Module.
6. Insert the Electrodes attached to the Module into the Fruit as far apart as possible.
7. Insert the Electrodes of the Jumper Wire so that each BLACK Electrode is next to a RED Electrode with about 1/4" between them.
8. If the Clock does not begin to run after 60 seconds, move the Electrodes closer together (but not touching).
9. After the Clock runs for several days, the holes in the Fruit may become dry. When this occurs, reposition the Electrodes to new locations in the Fruit. (It may then be necessary to reset the time and date.)
10. From time to time you will want to change the Fruit or Vegetable that is powering your clock. Just repeat these easy steps to install a new Power Source.

Enjoy reliable time and date information provided by the power of a fresh fruit from THE TIME IS RIPE. In order to generate the maximum amount of electricity, it is important to insert the two pairs of electrodes as far as possible from each other in the fruit.

Remember that the electrodes of each pair (one red and one black) must be close together BUT NOT TOUCHING and about 1/4" apart. Look again at the electrodes and see how they are inserted in the foam ball.

Each time you change the power source for your clock use the same steps and discover how a fruit or vegetable can be the ultimate in environmentally responsible power sources.

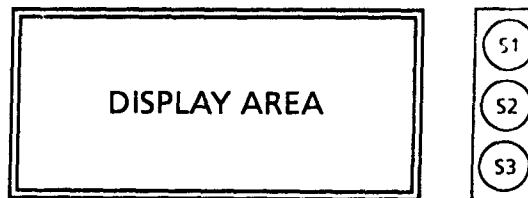
### TROUBLESHOOTING YOUR CLOCK

If your clock does not work, check the following:

1. Electrodes must be in UNMATCHED pairs (red with black). The unmatched pairs of Electrodes should be as far apart as possible in the Fruit.
2. Each pair of UNMATCHED Electrodes should be 1/4" apart.
3. The Electrodes should NOT BE TOUCHING.
4. If the Fruit or Vegetable is old and dried out, replace it with a new one.
5. Electrodes may need cleaning (sand lightly or scrape lightly with a knife blade).

### SETTING THE CLOCK AND CALENDAR

After some use you will learn to set your clock without any instructions. To set the clock and calendar:



1. Display Sequence
  - Normal Display: hour and minutes
  - Press S1 once: month and date (auto return to time)
  - Press S1 twice: seconds only display
  - Press S1 again: return to normal time display
2. Time and Date Setting
  - Press S2 once: To display alternating Time and Date.
  - Press S2 twice: MONTH ONLY Press S1 to set.
  - Press S2 three times: DATE ONLY Press S1 to set
  - Press S2 four times: MINUTES ONLY Press S1 to set
  - Press S2 five times: HOUR ONLY Press S1 to set
  - Press S2 again: To return to Normal Display.
3. To display the DATE from time to time, press S3 once.