



TimeMaster H.O. User's Guide

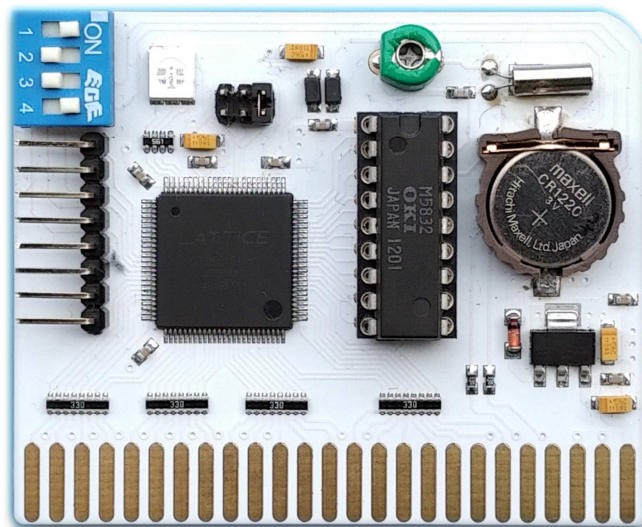


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Description

Back in the day, Apple II's didn't have real time clocks so you couldn't see from files when they were created or use the date/time in your programs, calculate time intervals and so on. Several companies released their own Real Time Clock card solutions for the Apple II. Most popular being the Thunderclock Plus from Thunderware Incorporated released in 1980. It quickly became the standard "clock cards" of the time that majority of different software supported. An another popular card was AppleClock by Mountain Computer. Later Applied Engineering released Timemaster II H.O. – the fourth generation of clock cards – most likely, the most advanced clock card released for the Apple II. It was capable of showing 24 hour format or 12 hour with AM/PM format, millisecond timekeeping with an accuracy of 0.005%. It had a on-board timer which could time down any interval up to 48 days. It also maintained an internal calendar, separate of the 7 year cycle which ProDOS mapped. The Timemaster H.O. was 100% ProDOS and DOS 3.3 compatible.

The H.O. was for "High Output". This referred to the Digital I/O port on the card for remote commands. Through this port, one could hook up Applied Engineering's BSR X-10 interface and "command console" to remotely control for example lights and electrical appliances. The BSR-system could send signals over existing 120 volt wiring.

Timemaster II H.O. by a2heaven.com is modernized, smaller, if not tiny, clone of the original Applied Engineering card with the I/O connector for home automation X-10 -devices.

Contents of Package

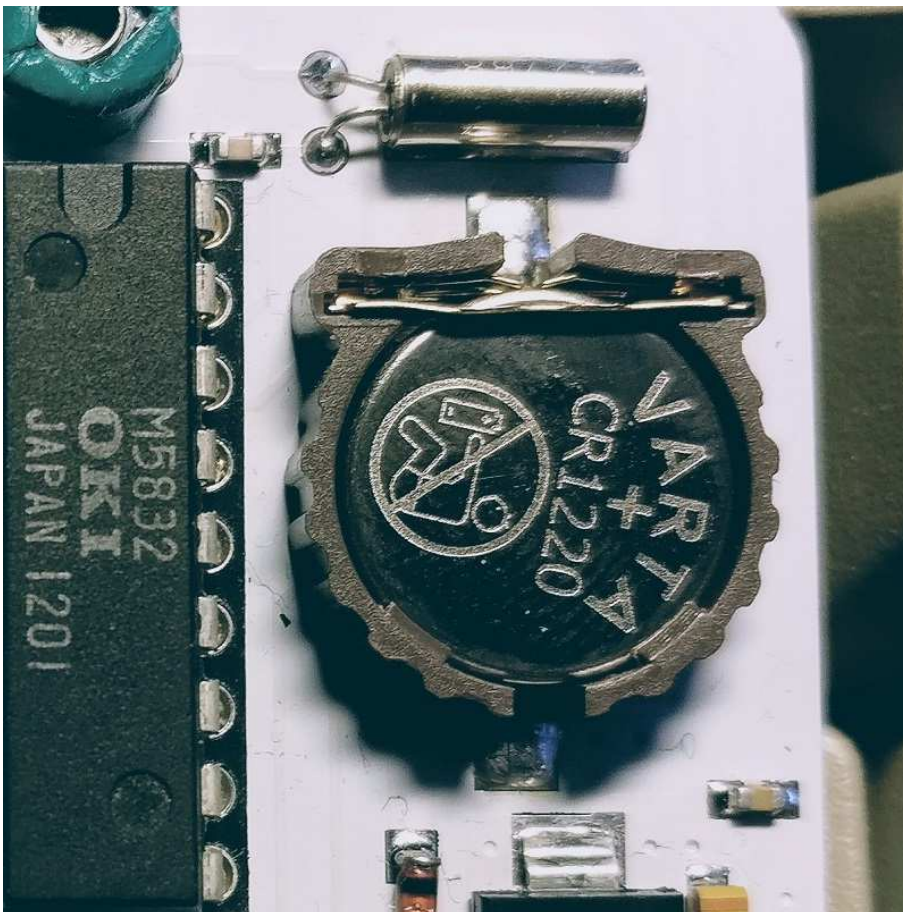
TimeMaster H.O. – TimeMaster H.O. PCB

Installation

You need to supply the battery yourself, it is common type CR1220. There's holder for it in the card PCB. I had to press & bend the small metal fingers in top side of the battery holder so they would keep the battery in place and it not dropping off.

The card be installed in any slot, expect 0 in II+ or AUX in //e. Preferred slot is 4. Some **commercial** software expects a clock to be in slot 4 but it does work in any slot.

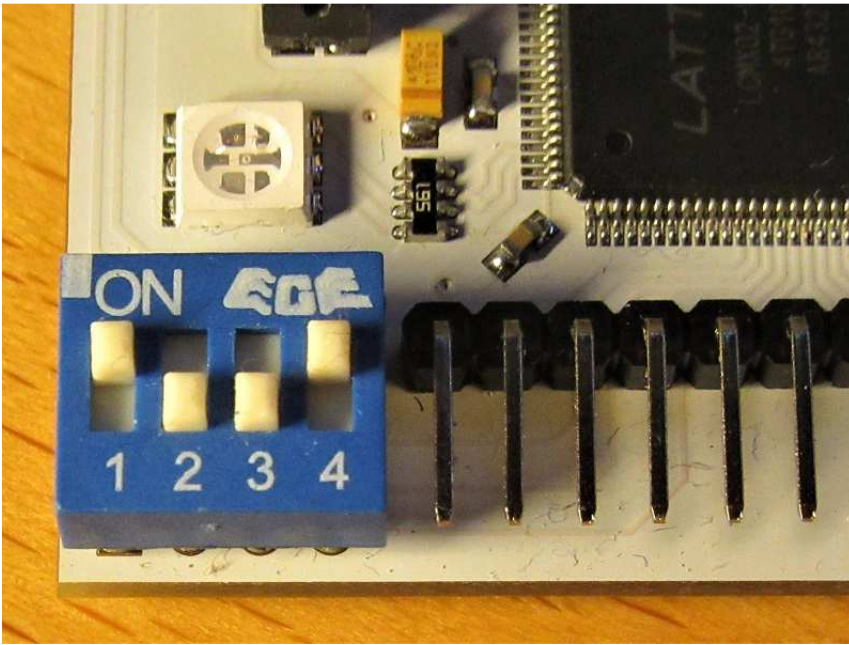
Make certain the switch #1 is ON (closed) in order to be able to setup the time. After setting the time you can if you wish, so you **won't** accidentally change it, turn it OFF.



Switches

There are four switches:

- #1 Set the time ON/OFF (must be CLOSED when setting the time)
- #2 Mode: of the clock : Appleclock / TimeMaster II (selects the display mode)
- #3 Enables the Non-Maskable Interrupt
- #4 Enables the Interrupt Request



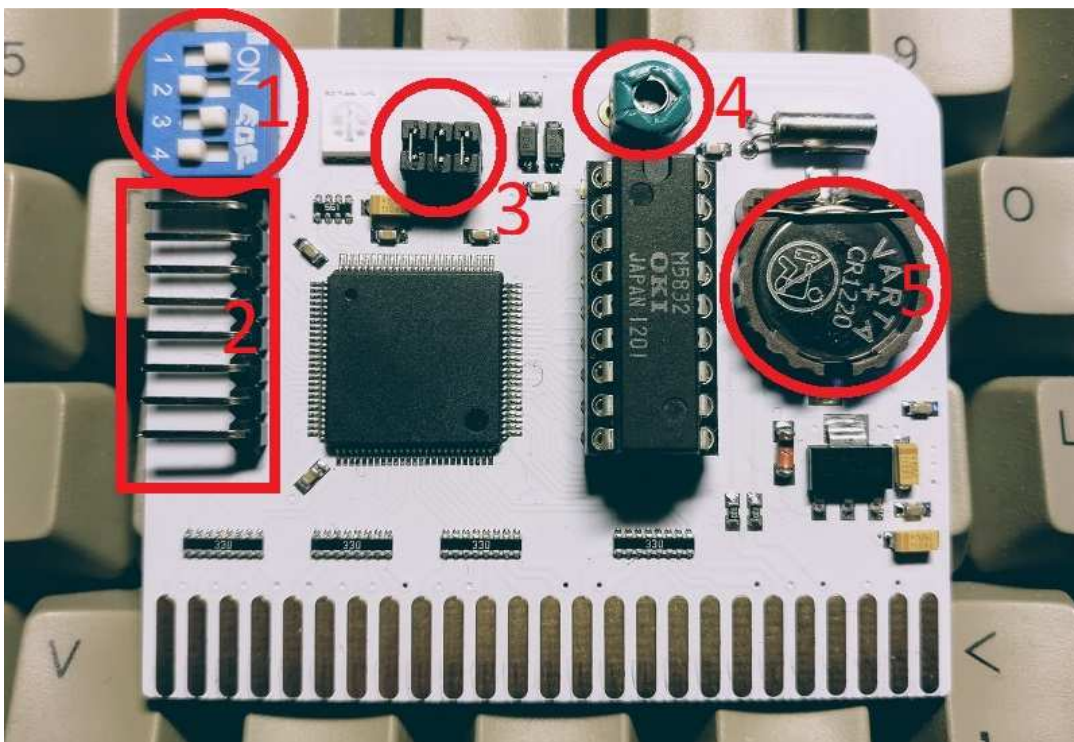
Jumpers

There are three jumpers on the card, all with jumper inserted. You can control the led's of the card with these jumpers inserted/removed.

When jumper inserted (LED is "ON") or not inserted (LED is "OFF"):

- First jumper = GREEN accessing the clock
- Second jumper = RED write access
- Third jumper = BLUE interrupt access

When powered the GREEN or BLUE led is light, depends of the mode of the chosen clock card type. This works with or without jumpers inserted



- 1 - Switches for modes/interrupts
- 2 - Pins for BSR/X10 devices
- 3 - Jumpers for enabling/disabling the LED's
- 4 - Adjusting the quartz crystal
- 5 - CR1220 battery holder

Usage

The Timemaster II H.O. supports fully DOS 3.3 (patched), ProDOS, Pascal and CP/M.

The current time information is available from the clock via DOS 3.3, ProDOS, Pascal etc. to your own programs. Also there's support for CP/M if you have such card installed on your system.

It supports:

-Time in hours (24 or 12 with AM/PM format), minutes, seconds and milliseconds (the only ProDOS compatible card with millisecond capability).

-Date with year, month, day of week and leap year.

The different modes:

Dip switch #2 : Mode of the clock : Appleclock/TimeMaster II (selects the display mode)

- AppleClock = (CLOSED) support for older types of Clocks and formats.

Format : MO/DD HH:MM:SS:WYY

- TimeMaster II = (OPEN) support for many other more modern types of Clocks and formats.

Supports various output formats & Thunderclock (Applesoft, Integer) compatible.

(CLOSED)

APPLE CLOCK MODE :

MO/DD HH:MI:SS:WYY

12/14 15:30:23:384

(OPEN)

TIMEMASTER MODE :

W MO/DD/YY HH:MI:SS

3 12/14/83 15:30:23

THUNDER CLOCK APPLESOFT :
WWW MMM DD HH:MI:SS PM
FRI DEC 14 04:30:23

THUNDER CLOCK APPLESOFT :
WWW MMM D HH:MI:SS
FRI DEC 14 15:30:23

THUNDER CLOCK APPLESOFT :
MO,OW,DD,HH,MI,SS
12,03,14,15,30,23

THUNDER CLOCK INTEGER :
WWW MMM DD HH:MI:SS PM
FRI DEC 14 03:30:23 PM

THUNDER CLOCK INTEGER :
WWW MMM DD HH:MI:SS
FRI DEC 14 15:30:23

The Timemaster II mode is clearly preferred mode with its larger variation of supported output formats. TimeMaster II H.O. is really 8 clocks in one with its different modes!

READING THE CLOCK

Reading the time can be done by Basic easily. You can call the clock easily and get different formats of time to be used in your own programs. That depends however what mode your card is set on. Clearly the TimeMaster mode is superior.

It's also possible search in your basic program the actual slot where the card is installed and what mode it is currently at. Other languages can be used to fetch the time and date from the clock as well.

The card supports milliseconds, for that the interrupts are needed (setting up the switch for it). DOS 3.3 can be made to support it with "Patch DOS 3.3 for Interrupts".

Automatic time/date stamping (DOS 3.3):

To use time/date stamping with DOS 3.3, there's patch for it "INSTALL DOS DATER". The card must be in TimeMaster mode (#2 open)

Automatic time/date stamping (ProDOS)

With ProDOS it's already automatic there's no need for patching. It shows already the info as : Date and time of original creation of the file, and date and time of last modification.

Timemaster II H.O. supports fully DOS 3.3 (patched), ProDOS, Pascal and CP/M.

Remote Control

The BSR X-10 interface for the TimeMaster II H.O. allows you to send remote control signals to your BSR Ultrasonic command console. The command console sends the commands to your 120 Volt AC wiring to remotely control appliances or almost any electrical device plugged with BSR remote module with. So you can turn on lights or heating. Real high tech for mid 1980's !

Calibration

Over the time the clock quartz crystal oscillator may slightly need to be adjusted, this can be done with the trimmer top of the 18-pin chip in the middle by using small screwdriver.

Frequently Asked Questions

Q. Who makes the TimeMaster H.O. card?

A. The adapter was designed and built by Plamen Vaysilov from a2heaven.com.

Q. How much does the TimeMaster H.O. card cost?

A. At the time of writing this document (Late Jun 2019), the price was US\$65.00 which includes shipping to anywhere on the planet.

Q. Where to get detailed info how to use TimeMaster H.O. card?

A. You can find answer in Applied Engineering TimeMaster H.O. User manual.

Where to find further help

Phone: +359 888 810 993

Email: info@a2heaven.com

About a2heaven.com

A2Heaven is a small company that implements new technology for use on vintage computer hardware.

About this User Guide

This User Guide was written by Jorma Honkanen and Plamen Vaysilov, also using materials from Applied Engineering TimeMaster H.O. User manual.

Current Version 1.00, 11th Jun 2019, 1st public release.

Warranty

A2Heaven.com warrants the TimeMaster H.O. adapter for 6 months or 180 days, from the date of purchase. This warranty assumes the TimeMaster H.O. adapter has not been tampered with in any way.