



Meeting Minutes, April 5, 2013

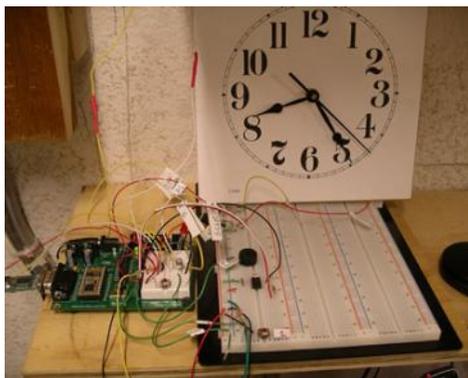
THE QUEST FOR ONE SECOND ACCURACY

The meeting was called to order at 8:00 p.m. by Secretary Phyllis Adams.

The program was presented by our member Tony Baker, and the subject was his project clock, which can be seen at logicclock.com.

Tony is an electronics engineer and when he was laid off in 2010, he decided to use his knowledge to create an extremely accurate clock. This led to a clock made as a hybrid using electronics and a precision mechanical pendulum. He wanted to use current advances in materials and electronics, and the clock design was to be designed to be as accurate as possible, but must be fabricated entirely by Tony in Tony's shop, with Tony's tools, with Tony's skills, and the components must be readily available.

A mechanical clock can be accurate to 4.9 seconds per week, but Tony wants



Circuitry that drives the clock

accuracy of 1 second a week. He tried using a GPS system and a pendulum. He also tried a \$25 movement and took the



The makings of the Hybrid Clock

coils out and replaced with a microprocessor. He stated that this is about solving problems and is an ongoing project. The clock is in a long case. He is using a glass rod for a pendulum, which he has hollowed out with a drill, and is also using a glass compensation sleeve.

After this very informative program, we had Show & Tell using the letter 'W'.

Ray Brown showed us three clocks: A Warner electric "car clock" circa 1918 from Belloit, MI, a Warren Clock Co. Synchronous electric clock by Henry Warren which is solid bronze and sold for \$75. In 1926 it was awarded as a prize; and a Wallace Clock Company clock from 1928 with a battery and pin-wheel escapement.

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This Month

FOUR GENERATIONS OF WATCHCASE MAKERS

This month, "Four Generations of Watchcase Makers". The show features the watchmaking craft as practiced by Martin Matthews. Martin, known internationally, is one of our most important contemporary Ho-



Martin Matthews in his workshop

rologists. He is the fourth generation of a Clerkenwell London family of watchcase makers whose remarkable skill, patience and expertise turns a sheet of silver into an elegant watchcase before your very eyes!

His gentle manner and sense of humour come through with his detailed commentary as he works on his antique tools passed down through the generations.

TIME TRIVIA

The first mechanical alarm clock was invented by Levi Hutchins of Concord, New Hampshire, in 1787. However, the ringing bell alarm on his clock could ring only at 4 am. On October 24, 1876 a mechanical wind-up alarm clock that could be set for any time was patented (#183,725) by Seth E Thomas.

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Doug Lynn showed a Robertshaw animated alarm with a parade wheel.

Dave Weisbart showed us a Waterbury from 1867 or earlier called "Square Rose" which has a 30 hour movement.

Door prizes were won by Gene Osten, Stan Goldklang and Christopher Mabry.



Doug's Robertshaw Alarm



Ray with his Warren Clock



Waterbury "Square Rose"



UPCOMING MARTS

MAY 2013

[2013 Pacific Northwest Regional](#)

When: May 16 - 19

Where: Monarch Hotel & Conference Center, Clackamas, OR, US

[2013 North Coast Regional](#)

When: May 17 - 18

Where: Lakeland Community College, Kirtland, OH, US

JUNE 2013

[2013 KY Bluegrass Regional](#)

When: Jun 21 - 22

Where: Fern Valley Hotel and Conference Center, Louisville, KY, US

JULY 2013

[2013 National Convention](#)

When: Jul 3 - 6

Where: Dayton Convention Center, Dayton, OH, US

[2013 Rocky Mountain Regional](#)

When: Jul 19 - 20

Where: Jefferson County Fairgrounds, Golden, CO, US

AUGUST 2013

[2013 Mid-West Regional](#)

When: Aug 2 - 3

Where: Porter County Expo Ctr, Valparaiso, IN, US

[2013 Eastern States Regional](#)

When: Aug 16 - 17

Where: Holiday Inn Convention Center, Liverpool, NY, US

[2013 All Texas Chapters Regional](#)

When: Aug 22 - 24

Where: Marriott Houston Westchase, Houston, TX, US

[2013 Mid-South Regional](#)

When: Aug 29 - 31

Where: Chattanooga Convention Center, Chattanooga, TN, US

Full details for all upcoming marts: <http://community.nawcc.org/events/upcomingevents/>



Whatever you're looking for...

Come to the Nineteenth Annual

GOODYME SUPERMART

May 18, 2013 • El Bekal Shrine, Anaheim



The Goodyme Supermart Is Here!

It's that time of year again. The Chapter 69 Goodyme Supermart is returning to the El Bekal Shrine in Anaheim on May 18. Every year since we moved there, all the tables have been sold ahead of time, and we always see lots of clocks and watches leaving with their new happy owners.

We need every chapter member who intends to participate, whether as a buyer or a seller, to pre-register! This makes planning much easier for our volunteers. So, as soon as you finish reading the Tic Talk Times, go to the web site (nawcc69.org) and click on the Goodyme Supermart link on the left side of the screen. Print and fill out the registration form, then bring it with you to the meeting or send it in to Bob Linkenhoker right away.

We have many volunteers to help with mart functions, but we could use a couple of able-bodied helpers to set up and/or take down the tables. Contact Dave Weisbart at the meeting or drop him an email at webmaster@nawcc69.org if you can help.

The Ultra-Accurate Pocketwatch?

Could this be the chronometrist's ultimate timepiece, the peak of horological haute couture? British bespoke movement maker Hoptroff today claimed to have produced the world's first personal chronometer with an on board atomic clock.

The result, says Hoptroff, is a accuracy of 1.5 seconds every 3.15×10^{10} seconds - that's 1000 years in less mind-boggling numbers.

At the heart of the movement is a Quantum SA.45s "chip scale atomic clock" made by US company Symmetricom, which specialises in high-precision timekeeping gadgetry, particularly for military, aerospace and national utility infrastructure applications. Cruise missiles use the technology to cope with GPS signal jamming. It's also used underwater, where GPS signals won't penetrate.

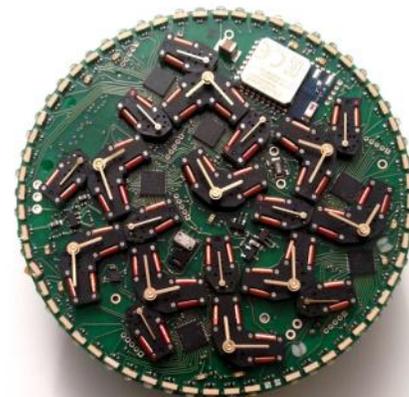
The unit contains a temperature controlled caesium gas chamber. A laser is used to heat the radioactive atoms, and a microwave resonator to detect the emissions from the atoms' electrons as they change energy levels. The frequency of the microwaves is highly stable and provides the clock's beat.

The hermetically sealed, RS-232 interfaced SA.45s has, as we say in the trade, an Allen Deviation of 2.5×10^{-10} at a Tau of one second - the difference between two successive time readings is microscopically small. The unit's 10MHz output has a peak-to-peak, tick-to-tock deviation of 250µHz RMS.

Unfortunately, the SA.45s is small but not tiny. At 40 x 34.8 x 11.3mm, it's too big to go into a wristwatch, so Hoptroff's mechanism has been designed for pocket watches. Full- or half-hunter - or even open case - is presumably up to you.

Inside the case, Hoptroff has crammed a lithium-polymer battery fed through a micro USB port. It has also built in a Bluetooth radio, plus humidity, temperature and pressure sensors, and even a magnetometer - all of which help drive the 28 dials that make up the watch's face.

Hoptroff's atomic watch isn't so much a product as a prototype. It's only planning to make two dozen of them at first, which is probably wise since the price is an 'if you need to ask...' unannounced five-figure sum



Face Side of the Ultra-Accurate Clock



The "heart" of the clock

**DATED MEETING NOTICE
PLEASE DO NOT DELAY**

*The National
ASSOCIATION OF
WATCH & CLOCK
Collectors, Inc.*
Orange County Chapter No. 69
c/o Cora Lee Linkenhoker
7186 Calico Cir.
Corona, CA 92881



OUR NEXT MEETING: FRIDAY MAY 3, 2013

Program:

**VIDEO: FOUR
GENERATIONS OF
WATCH CASE
MAKERS**

Beginner's Corner Mini-Seminar:

No Beginner's Corner this month

Show & Tell:

Horological items beginning with letter "X", "Y", or "Z"

Board Meeting:

No board meeting in April

Time: 7:00 – Doors open
8:00 – General Meeting

Admission: \$4.00 – General
\$6.00 – Couples

Location: Acacia Grove Masonic Lodge
11270 Acacia Parkway
(in the Civic Center)
Garden Grove, CA

