



## The Breitling Story

by Henri Bonnet

When Daniel Jean Richard in the early 1800's initiated the cottage industry in the Jura mountains of Switzerland for the manufacture of clocks, he most likely was unaware of the quiet revolution he's brought forth, with repercussions to this very day. By parceling out the production of clock parts, and later on, watch components to farmers in the vicinity of Le Locle, he opened up opportunities for anyone with reasonable manual skills. It didn't take long before the concept was copied, and spread to other areas of the country. This particularly clever distribution of labor allowed local residents to earn a living all year long, and it inevitably attracted people from neighboring cantons and states. In the mid-1800's, the Breitling family emigrated from Stuttgart, Germany to the Swiss village of St. Imier, not far from the French border. It is there that Leon Breitling, at an early age, began his apprenticeship as a watchmaker. In his mid-twenties he was already making complicated watch mechanisms that eventually led to the construction of chronographs. The numerous benefits of the nascent cottage industry weren't lost on him, and he realized that it is far better to specialize, than to be an all encompassing manufacturer. With this in mind he moved to the small town of La Chaux de Fonds, which was at that time the center of the watch industry, and where many parts suppliers were located. In the late-1800's Leon Breitling built a factory there on Rue Montbrillant and started producing watches under the same name. Leon Breitling died in 1914 and his son, Gaston, an accomplished watchmaker himself, took over the business.

Gaston undertook the perfecting of chronographs, which was Breitling's specialty, as well as its major source of income. The firm manufactured chronographs, timers, and stopwatches for science and industry, as well as for the police, the military, assorted sportsmen, and for aviators in particular. Eventually Gaston dropped the name "Montbrillant" and started marketing watches exclusively under the name "Breitling". The company soon produced "approved" chronographs for major sporting events.

Gaston Breitling died in 1927 and his son Willy took charge of the firm shortly thereafter. By that time Breitling chronographs became the preferred timepieces of several Air Forces in Europe, as well as of major airlines. From the very beginning, Breitling decided to produce only practical timepieces rather than luxury watches, concentrating mainly on chronographs. Breitling resolved early on, to become an "assembler" rather than manufacturing every component in house. The company fully recognized the value of specialization, and acquired practically all its watch components from specialty houses. Raw movements (ebauches) were purchased from Venus, Unitas, Felsa, and Landeron as well as from other manufacturers. Dials, hands, and cases were also obtained from miscellaneous specialists. Breitling did the assembly and adjustments, (sometimes referred to as "finishing"), as well as marketing and distribution.



Breitling Premier, 1945

In 1952, Breitling moved its headquarters from La Chaux De Fonds to Geneva. In that year the company unveiled its famous "Navitimer", a chronograph especially made for pilots. ("Navi", stands for navigation). The "Navitimer" was fitted with a 12 hour totalizer as well as with a circular slide rule. This chronograph soon became a best seller in Europe and overseas. In the United States, the Aircraft Owners and Pilots Association (AOPA) adopted it as its "official" chronograph. The "Navitimer" even went to space, on the wrist of Commander Scott Carpenter as part of the Mercury Program. Until the advent of GPS and electronic navigation instruments, the Navitimer was indeed the wristwatch of choice for most pilots. In the mid-1940's Breitling entered the American market, in cooperation with the Wakmann Watch Company. The United States soon turned out to be Breitling's most important revenue source. Until the late 1960's Breitling chronographs, including the "Navitimer", were all hand wound timepieces. The 1970's saw the appearance of the "Chronomat", featuring automatic winding. Here too, the "Chronomat" was an amalgam of modules purchased from Heuer, Buren, Dubois-Depraz and other ebauche manufacturers.

Continued on page 3

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## PRESIDENTS MESSAGE

By Mike Schmidt

Good news for pocket watch and wristwatch collectors. Chapter 190 will be offering education opportunities for pocket watch and wrist watch collectors. Offered are the "FSW 302 Beginning Wrist Watch Repair Workshop" August 24-27 and the "FSW 301 Beginning Pocket Watch Repair Workshop" December 7-10.



A watch repair workshop and clinic is provided each monthly meeting beginning at 11:30 am. This will be led by Jorge Montoya with input from Ferdinand Geitner. Everyone is welcome to bring repair questions or participate in the discussion.

Dave Coatsworth will return this month with a new estate acquisition to be added to his mart tables of watch repair parts and tools.

I have been and will continue the collection of names and information on all who want clock, watch, lathe, tablet painting, dial painting, and any other horological workshops. Our workshops are open to all NAWCC members, so please let me know what your interests may be. Mike Schmidt eaglecreekclocks@msn.com

The program for the April meeting will be "French Clocks" and will be presented jointly by Ferdinand Geitner and Giorgio Perissinotto. Ferdinand will discuss the French movements and Giorgio will tell us about the French case designs. We will follow up with questions and a show and tell with French Clocks. A special door prize will be given for show & tell.

The Sunday morning meeting Clock Workshop begins at 10:30 am. The beginning topic for this round table discussion will be "Calculating beats per hour and calculating a pendulum length" The leaders for this discussion will be George Antinarelli and Paul Skeels. Everyone is welcome to bring their clock and watch repair questions. The coffee will be on early.

See you at the meeting

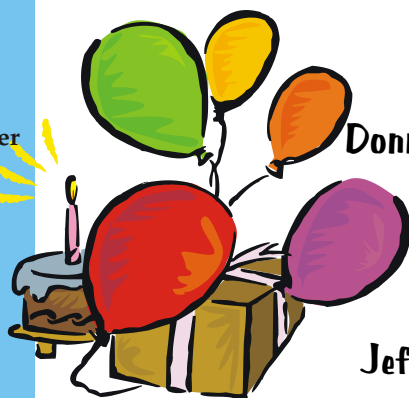
*Mike Schmidt*

## Happy Birthday

Donna Gaglini, Tom Gaither, Cathy Gillogly

Ron Kubitsky, Loren Miller,

Jeff Slobodian, Larry Smith, & Lee Wade



Continued from page 1

In the mid-1970's Breitling began offering a quartz version of the "Chronomat", and shortly thereafter a quartz "Navitimer" was produced with a combination of analog and digital display.

In 1979, the company had to close its doors due to financial collapse, as a result of the proliferation of inexpensive timepieces from the Far-East. In the early 1980's Breitling was sold to Ernst Schneider, head of the Sicura firm. He continued to manufacture electronic chronographs, but never lost sight of its mechanical counterpart. The new owner, an accomplished pilot himself, initially concentrated almost exclusively on the production of timepieces for aviators. Breitling celebrated its 100th anniversary in 1984 and soon thereafter renewed its manufacture of mechanical chronographs. In the 1990's, Breitling was offering around 50 different chronograph models. For the sake of economy, Breitling continued to buy raw movements from Venus, Valjoux, and ETA, as it would have been much more expensive to fabricate such movements in house. Breitling was more concerned about the quality and price of its timepieces, rather than about the source of its components. In addition to chronographs, Breitling eventually produced a whole series of men's and women's everyday wristwatches of high quality and reasonable price. Some of those timepieces were of chronometer standards and came with a certificate of accuracy from a Swiss government authorized testing agency. A few years ago, when ETA decided to no longer furnish ebauches to its customers, Breitling developed an in house caliber, designated as B-01. Today all Breitling wristwatches are tested for accuracy by a Swiss government approved testing agency, and come with the coveted designation of "chronometer". (See my article of Nov. 2010.) Breitling timepieces are always good value, due their high ratio of quality to price.

See pictured below, a pilot chronograph from the early 1970's fitted with a Valjoux movement, marketed in the United States by The Wakman Watch Company, in cooperation with Breitling. Notice the AOPA symbol on the dial. The other timepiece is an early 1990 quartz "Navitimer" chronograph with a combination of digital and analog display. It features 8 different functions, all controlled from the crown. The case and the bracelet are made of titanium and the watch is waterproof to 10 atmospheres. ■



## THE CUCKOO

by Ken McWilliams



I recently repaired the above cuckoo clock. Nothing really noteworthy about this clock, it is a typical mid-70s, eight day, time and strike clock. But as I worked on the movement, something about the case was nagging at me. I looked at it several times, but nothing jumped out at me, just two cuckoo's standing by their nest with two chicks.

After a while, it finally hit me. I remembered that the European cuckoo birds do not make nests, they are what is known as "brood parasites," they lay their eggs in other species of birds nests, and then let them raise their offsprings. The cuckoo egg has a very short incubation period, and hatches earlier than the hosts eggs. The cuckoo chick also grows faster, and in many cases, the chick ejects the eggs or the young of the host.

Cuckoos have evolved various strategies for getting their egg into a hosts nest. Female cuckoos have developed very fast egg laying abilities. In many cases males have been known to lure the host birds away from their nests so that the female can lay her egg. (They only lay one egg per nest.) Some species of birds have learned to recognize the cuckoo egg, and ejects it from the nest when discovered. Cuckoos, on the other hand, have learned how to produce eggs that are similar to the intended hosts eggs. Many host birds do not exhibit egg rejection behavior, even though the cuckoo egg looks very dissimilar from their own, and dutifully, feeds and raises the cuckoo chick as their own. (See photo, right)

So, the depiction of the two cuckoo birds standing over their nest just isn't reality, and that is what was bothering me about the clock case.



Now that I think about it, Jack Nicholson's movie, "One Flew Over The Cuckoo's Nest" was inaccurate as well, since there are no cuckoo nests. ■

# Tales From the Bench

by Ferdinand Geitner

## Wood Wheel Repair

Artists & craftsmen are still creating beautiful and interesting works of art. It becomes even more enchanting when the art is moving and telling you the time as in this model of a wooden “Grandfather” clock.

The skill in making the wood into a precision timepiece is exceptional and presents unique challenges. One cannot use normal lubrication on the pivots. The bearings and friction surfaces have to be especially smooth and accurately shaped. The moving (living) wood expands with any liquid lubrication and can lock up. Craftsmen used talcum powder and wax to reduce friction in the past, I'm grateful for modern technology and use very fine graphite powder readily available for locks in hardware stores. In order to make the clock run for a full week, there was an elaborate double pulley arrangement and a rather heavy weight.

The pendulum had a modified version of a knife suspension which was a circle of about 1 ½ inches at the top of the pendulum with a wooden point coming down in the middle which rested on a post with a tapered hole. When trying to make “everything” out of wood without introducing any steel parts some problems will inevitably show up in its later years as in this example. The point on the pendulum suspension will wear somewhat rounder therefore increasing friction and slow the amplitude of the pendulum, and eventually stop it.

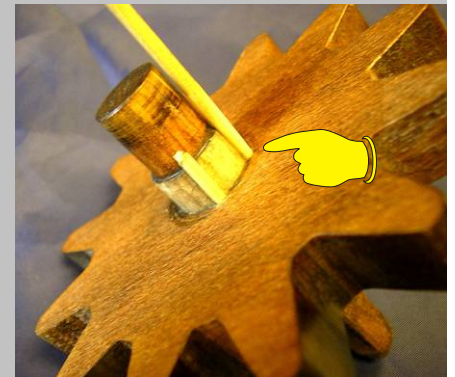
The customer informed me that she could no longer wind the clock and after examining it, I found the arbor of the winding gear was slipping in the center of the wheel. I wanted to keep to the original theme of no steel or glue and decided to use two shims to lock the arbor and wheel together in a friction fit (see pictures)

It was successful, and now I just wait for its next hiccup to appear; a kind of job security. ■

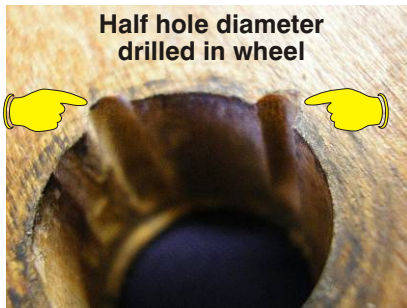
Wheel and arbor ready for assembly



Wheel assembled on arbor and locking dowel inserted.



Second dowel inserted



Dowels are trimmed flush with wheel

Finished wheel and arbor



# QUESTIONS AND ANSWERS

by Ken McWilliams

*I have not received any questions from our readers in the last two months. All of the questions thus far have been from e-mails sent to me by friends and colleagues. Perhaps this column has limited interest and should be replaced. I would appreciate your opinion.*

*If you have any questions or want to chime in on one of the answers, e-mail me at: [internut@socal.rr.com](mailto:internut@socal.rr.com).*

## QUESTION:

I have a two weight wall clock that keeps okay time, however, I think that it would keep better time if the pendulum did not wobble so much. I have looked at the suspension spring, crutch, and pendulum rod, and everything looks good to me. I have to admit though, that I'm not sure what I should be looking for. What can cause the pendulum to wobble?

## REPLY:

A pendulum that wobbles can, in fact, have an effect on a clock's timekeeping ability. The most common cause for pendulum wobble is a kinked suspension spring. You didn't say what make your clock was but it, most likely, has a double suspension spring. (Two springs mounted side by side in a common holder.) If one side is kinked, longer, or thinner than the other, it can account for the wobble. I have seen on several occasions, when a suspension spring of the correct thickness was not available, the clockmaker would sand down a thicker spring to the desired thickness. Often, this would make one side of the spring thicker than the other, which could cause the pendulum to wobble.

There are many ways that pendulums are hung and driven, and just as many ways that can cause problems. One common factor that applies to all methods by which a pendulum is hung and driven is that all interfaces must be perpendicular to each other, and that all connections must be correct.

Let's start with the pendulum and suspension assembly. At the very top, there will be a suspension post of some type. The post should be at a right angle to the pendulum with the slot for the suspension spring in line with the pendulum. The slot should also hold the suspension spring with little or no side play. The suspension spring should have enough freedom to allow the pendulum to align itself with gravity, however, excessive sloppiness can cause problems. The pendulum or a pendulum hanger will be attached to the bottom of the suspension spring. Make sure that the hook contacts both suspension spring pins evenly when the pendulum is stopped and centered. Unevenness will make the pendulum shift from pin to pin during its arc. If a pendulum hanger is used, make sure that the pendulum is attached to it evenly also. Lastly, make sure that the bob is not excessively loose on its rod to the point that it can move

during its swing. Correcting any of the problems mentioned here will usually fix most wobble problems.

The last part of this equation is the method by which the pendulum gets its impulse. This is usually by way of the crutch. The most common crutch is one that incases the pendulum rod or hanger, either by wire loop, fork, or brass slot. Make sure that, regardless of the configuration, the impulse surface is perpendicular in both axis to the pendulum rod. The pendulum rod should move freely within the confines of the crutch but not have excessive play that will diminish the impulse. This is especially true for English tall case clocks that have a rectangular drive surface on the pendulum rod.

European regulator clocks and some American clocks, have the pendulum and suspension assemblies mounted to the case. The same rules stated earlier apply to these as well. The difference between these and movement mounted pendulum assemblies is the method of impulse. The crutch will have a pin that drives the pendulum. Check to make sure that the pin is tight on the crutch, looseness here can cause problems. The pin will fit into the slot of a brass wear plate attached to the pendulum rod. It is very important that the pin is perpendicular to the pendulum rod in both axis. The pendulum should move freely with no binding but with a minimum of slop.

If all of these parameters are met, there should be no pendulum wobble.

## QUESTION:

A customer brought in a 1950s Moonbeam electric alarm clock. The bulb burned out and she took it to another repairman who misplaced the old bulb and told her to just scrap the clock. She has had the clock since it was new and does not want to scrap it. My dilemma is, I have no idea what the bulb looks like but I do know that it is odd, because the socket has no threads. I have been unable to find any reference for a replacement lamp and I am considering putting in a new socket and use a night light bulb. Any suggestions?

## REPLY:

The Westclox Moonbeam electric alarm clocks were, and still are, very popular. In fact, a replica of this clock is available today; it uses LEDs instead of an incandescent bulb. The way the alarm clock works is, at your set time, the light begins to flash and in most cases will wake you up. If it does not, after a period of time, a loud buzzer goes off. Your idea to modify the clock to use a nightlight bulb would not work because it is only a 7 ½ W bulb. The original used a 25 W bulb.

The good news is, a replacement lamp is readily available. According to the Westclox repair training manual, the original bulb was a Westinghouse T-8, 25W, 120V, bayonet, double contact base. It looks like an old automobile taillight bulb. One source is [www.elightbulbs.com](http://www.elightbulbs.com). Search for Westinghouse 03717 (their part number) or the Westinghouse part number; 25T8DC/CD120v. This bulb and similar lower wattage ones were used in many lighted clock applications during this period. ■

### Marco Perez



Marco Perez is a recent member to Chapter 190, but he is not new to many in our club as he has been a long time member of Chapter 75.

Marco is originally from the lower East Side of Manhattan, New York. His family moved to Los Angeles when he was a youngster. He excelled in sports and played football and baseball for his high school. After graduating from high school, he attended the University of Southern California on a football scholarship. An injury to his knee cut short his football career at USC. While taking an injury break from college, he was drafted into the Armed Services and became a Combat PM. He spent a few years serving in the Orient, and part of his military career was in the Viet Nam conflict, "Trying not to get shot!" as he put it.

Upon returning from his tour of duty, he received a scholarship to Pepperdine University where he graduated with a double major in education (BA) and business administration (BS). He then attended Pepperdine pursuing an MBA in Business Management, and graduated in the first graduating class at the Malibu campus. After graduating, he worked as an application programmer, manager, and department manager in a number of companies, (EEO and Affirmative Action). He joined AT&T (Engineering), and then TransAmerica.

Marco is a man of many talents with many interests besides horology. He worked part-time as a magician, performing at the Magic Castle on and off for 20 years. He has retired from the Castle, and now works his magic on clocks.

He noted that he married a wonderful woman, Diane, and has two wonderful daughters, of which he is very proud. He said that: "Since I couldn't play football and baseball any longer, I decided to look for a new hobby. I have always been fascinated by watches and clocks, cleaning, assembling, repairing, etc. I have only been doing this since I joined Ken McWilliams's antique clock repair club 'TimeKeepers' at Kennedy High School about five years ago. I am now trying to learn as much as I can, as fast as I can."

***We welcome Marco to our club!*** ■



## EDUCATIONAL OPPORTUNITIES

The following workshops will be scheduled for 2012:

*Sherline Lathe Workshop* - Advanced tool making. (Date to be determined)

*F510 Clock Camp I* - This is 2 day course for students who have completed the F101 and 102 and want a Refresher course of that material

*F511 Clock Camp II* - This is a 2 day course for students who have completed the 103 and 104 and want a refresher course for that material

*FSW102 Time & Strike with spring Barrels and rack/snail striking* May 4-7. Coordinator: Dan McKinnon  
Contact: 805 682-0172 • e-mail: danmck823@msn.com

The following FSW Workshops are scheduled for the NAWCC NATIONAL in Pasadena:

*FSW 101* Introduction to Basic Time & Strike-The American Kitchen Clock- 4 day workshop  
June 11-14

*FSW 301* Introduction to Basic Pocket Watch Repair  
The American Pocket Watch  
4 Day workshop June 11-14

*FSW 501* The Repair & Replacement of an American Strip Recoil Escapement  
2 day workshop June 13-14

*FSW 502* The Atmos Repair Course-  
3 day workshop June 12-14

Contact Pam Tischler [FSWprogram@verizon.net](mailto:FSWprogram@verizon.net) for registration or information.

*Suggestions for chapter 190 workshops, demonstrations, or programs are always welcome. Contact any board member with your ideas.*

The next Meeting & Mart for Chapter 190  
is April 15 , 2012  
Sellers may start setting up at 11:30  
The Mart is open from 12:00 til 1:15  
The Meeting starts at 1:15

### PROGRAM "French Clocks"

Presented by Ferdinand Geitner  
and Giorgio Perissinotto  
A look at French clocks from  
mechanical and artistic views

SHOW & TELL  
Bring your favorite French clock

### This Month's Mini-Workshop

At 10:30AM,

"Calculating a clock's beat rate and  
determining a pendulums length"

This will be an open forum, moderated by  
George Antinarelli & Paul Skeels

At 11:30 AM

"Repairing pocket watches"

Moderated by Jorge Montoya

**THE WORKSHOPS ARE ALWAYS FREE!**

Welcome New Members



Keith & Bernadette Lord  
from West Covina



# CLASSIFIED PAGE

This page is dedicated to advertising for Chapter 190 members. It is, of course, free to members.

## SERVICES OFFERED

### **The Montecito Clock Gallery**

Restoration, repair, sales of clocks and watches.  
**Ferdinand Geitner**, mbhi, owner and operator  
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Monday through Saturday 10:00 to 6:00 pm.

**Tel. 805-650-8800**

## FOR SALE

### **WATCH REPAIR TOOLS & MORE!**

I will have a huge selection of watch repair  
tools and other items from my latest estate  
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dave@daveswatchparts.com



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Santa Barbara, CA 93110

**(805) 687-5116**

## WANTED

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French type-platform escapement (no pendulum)

Winding hole spacing of 38.9 mm, (1.53")

Repairable, other details available on request.

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*Antique French* 2 or 3 dial calendar clocks.

*Antique English* 2 or 3 gear-train skeleton clock.

Loren Miller, **Pacific Coast Clocks**

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Located in Firehouse Plaza (Main St. & Telephone Rd.)

**Tel. 805-650-8800**

### **- Chronometer -**

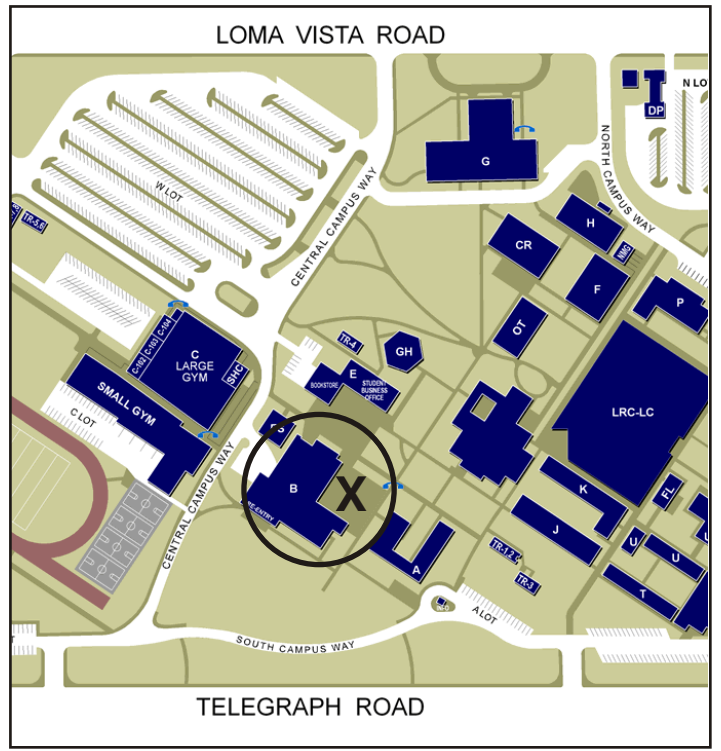
Hamilton 21 Marine Chronometer in running condition, with  
inner box and gimbals; outer box not essential.

Please contact: Giorgio Perissinotto

E-mail: [giorgio@spanport.ucsb.edu](mailto:giorgio@spanport.ucsb.edu)



The Chapter 190 meetings are held the third Sunday of each month. (No meeting in December)  
 We will meet in the cafeteria on the Ventura College campus. The cafeteria is located in building "B", east of the gym and athletic field.



**April 2012 Issue**

**NEXT MEETING**  
**APR 15**



**Chrono Times**  
 If Undeliverable return To:  
 17738 Superior St. Unit 21  
 Northridge, CA 91325



# MEMBERSHIP APPLICATION

For Ventura & Santa Barbara Counties Chapter 190 of the NAWCC

**NEW**       **RENEWAL**

PLEASE PRINT CLEARLY

Date: \_\_\_\_\_

Name: (First) \_\_\_\_\_ (Last) \_\_\_\_\_ Phone: \_\_\_\_\_

Street address: \_\_\_\_\_ City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_

E-mail: \_\_\_\_\_ Birth Day: (Month) \_\_\_\_\_ (Day) \_\_\_\_\_ NAWCC # \_\_\_\_\_  
*Membership in the NAWCC is required*

Person to contact in the event of an emergency: Name: \_\_\_\_\_ Phone: \_\_\_\_\_

### What is your clock/watch interest? (Check all that apply)

- I collect clocks     I collect watches     I have a basic understanding of  clocks  watches and have repaired a few as a hobby.
- I have studied  clock  watch repair via books, videos, or by attending classes. I repair clocks mostly as a hobby.     I have been repairing  clocks  for over 5 years and am familiar with many types of movements. I repair clocks for pay and as a hobby.
- I have a well equipped shop and can repair most  clocks  watches. I have an extensive knowledge of clock/watch design, function and repair techniques. Most repairs are for pay.     I am a serious collector of  clocks  watches and have a very good knowledge of their history, models and value.

Why do you want to be a member of Chapter 190? \_\_\_\_\_

Would you like to volunteer in helping Chapter 190 achieve its goals?  Yes, how can I help?  No, not at this time

Membership in Ventura chapter 190 of the NAWCC requires that you also be a member of the parent organization, The National Association of Watch and Clock Collectors. If you are not a member, you may join online by going to their website at [www.nawcc.org](http://www.nawcc.org), or you can contact us and we will send you an application.

Chapter dues run from January 1st to December 31st. Annual dues are \$25.00 for immediate family.

*Please make checks payable to;*

**Chapter 190 NAWCC**

*Mail this form & check to:*

**Ernie Jenson**

**25 Norma Ct, Camarillo CA 93010**

Family membership dues \$25.00 \_\_\_\_\_  
Membership includes spouse and other family members.  
Other members names.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**NOTE:** Spouse or family members do not have to be a NAWCC member when accompanying the primary member to chapter events.

Signature \_\_\_\_\_

**FOR CHAPTER USE**

Date received \_\_\_\_\_ Amount received \$ \_\_\_\_\_ Member ID number;

Added to mailing list. Date \_\_\_\_\_ Membership card sent. Date \_\_\_\_\_

Notes: \_\_\_\_\_