

TIME AND SPACE

Today's watchmakers produce sophisticated time pieces that unite astronomy and art. /// BY RAYMOND SHUBINSKI

Pieces of time

People told time for thousands of years by observing celestial objects. But in recent centuries, the trend has reversed. Man-made objects, such as watches, now tell us what time it is and — for astronomers — what time celestial objects will appear. Ironically, some of these

down-to-Earth time pieces come with astronomical prices.

During the 19th century, the age of the pocket watch, the Swiss excelled at what was known as “full-calendar” watches. These instruments told the time, the day of the week, the number and name of the month, and even the phase of the Moon. In an era without radio or television, such a watch was practical as well as a mechanical work of art. By the 1920s, watchmakers had reduced these functions to the wristwatch.

A few Swiss firms still produce such watches: Patek Philippe, Maurice Lacroix, Jaeger-LeCoultre, Ulysse Nardin, Audemars Piguet, and IWC. Watch manufacturers

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outside of Switzerland also produce high-tech timepieces for astronomers.

Patek Philippe

Founded in Geneva in 1839, Patek Philippe produces some of the most complicated mechanical watches in the world. These pocket and wristwatches not only have the classic full-calendar functions, they also include such features as sidereal time — measured by Earth's rotation with respect to the stars (rather than the Sun); perpetual calendars — that automatically adjust for the varying lengths of months; the date of Easter; and rotating Northern and Southern Hemisphere star maps.

In March 2001, Patek Philippe came out with an even more complicated model — a double-sided wristwatch. The Sky Moon Tourbillon provides the many functions



A MASTERPIECE IN 12 MOVEMENTS, Patek Philippe's Sky Moon Tourbillon is a symphony of astronomy, art, and watch-making ingenuity. PATEK PHILIPPE

standard in Patek Philippe models. Like any mechanical watch, you must keep it wound, and selling the family farm may not net enough profit to buy one, if you can get on the waiting list. Only two of these models are made each year.

Maurice Lacroix

Another Swiss firm, Maurice Lacroix, makes the Masterpiece Lune Rétrograde. This watch — a direct descendant of the full-calendar pocket watch of a century ago — has a beautiful mechanical movement visible through a transparent back. It also boasts a full-calendar display and a Moon-phase dial. With this watch, you will always know the best time to observe.

YES watch

If this all still seems a bit rarefied, we can come back down to Earth to find watches that provide a great deal of information at prices any amateur astronomer can afford. The YES watch is perhaps the most useful for astronomers.

Bjorn Kartomten designed the watch as a way to get in-sync with nature. The inspiration came to the Norwegian while visiting Machu Picchu. Kartomten wanted a watch that encompassed “natural” time — time based on the observation of natural events such as sunrise and sunset, Moon



THE SKY MOON TOURBILLON

Price: About \$750,000
This watch by Patek Philippe comprises 694 parts and presents the nocturnal sky on its reverse. Patek Philippe produces only two of these models a year.

PATEK PHILIPPE



T. A. RECTOR AND S. A. WOLPA/MAO/AURA



phases, and the motions of the Sun and planets — and conventional time.

When the YES watch hit the market in 1999, it didn't take Kartomten long to realize he had created the ultimate watch for astronomers. By combining both digital and analog displays with a proprietary chip, this watch is an astronomical computer ready to be strapped to your wrist.

At first glance, it looks bulky and unconventional. The current models, the



MASTERPIECE LUNE RÉTROGRADE

Price: \$18,250

Maurice Lacroix celebrated its 30th anniversary by launching its Masterpiece Lune Rétrograde. The date display at 10 o'clock is a retrograde indication. A power-reserve indication at the 2 o'clock position presents information about the winding state of the main spring and reminds the wearer to wind the watch. MAURICE LACROIX

Inca and Zulu, are made entirely of titanium, which makes the watch comfortable to wear. Just one hand circles the dial every 24 hours. To supplement the hour hand, an LCD display on the upper part of the dial provides the current time. Below that is a Moon-phase indicator.

The "shading" on the dial also shows how much daylight and darkness to expect each day. The watch can be customized to your exact longitude and latitude. Do you need to know the time for a second city on a regular basis? Just set the "Away" time as a second location.

But what if you need to call your aunt in Sydney? With a push of two buttons, you scroll through nearly 600 preset cities. The information scrolls quickly, so it takes little effort. Once you pick your new location, the entire display resets to show all its information respective to the new city.

With the push of one button, the watch provides current sunrise, sunset, moonrise and moonset times, and the Moon-phase percentage. The instrument also presents calendar information.

Perhaps the most incredible aspect of this watch is an LCD "line" along the main dial's outer edge. At a glance, you can see the times of moonrise and moonset. The shade "wedge" of day and night will give sunrise/sunset. This watch gives a graphic representation of the most basic information all astronomers want: the Moon's location and its relationship to the Sun.

This watch's features even teach astronomy lessons. On the summer solstice, for



THE ZULU

Price: \$695

YES watch's Zulu model gets its processing power from a microchip the size of a baby's fingernail. Algorithms collected from private astronomers, the U.S. Naval Observatory, and NASA were blended into a program that calculates extensive time data for the Sun and Moon through the year 2100. YES WATCH

example, use the preset on the watch for Sundsvall, Norway, to confirm the Sun will not set on this date. The YES watch also has alarms, timers, and other useful features you would expect from a quartz watch. It even has special "fireworks" displays for the solstices and equinoxes. All the unexpected features tie this watch to the cosmos in ways that make it unique.



THE HIGH-T

Price: \$725 with 6 months MSN Direct service free, \$59.95/year after initial period
Tissot's High-T with MSN Direct enables wearers to receive news, weather, sports scores, stock updates, appointment reminders, and — just in case — the time. TISSOT

Tissot

Maybe your computer meets your astronomical needs, but you want to track meteorological information from one observing site to the next. Certain watches provide this information. Several years ago, the Swiss firm Tissot introduced such cutting-edge technology in a wristwatch.

The Tissot T-touch watch provides important information for anyone who spends much time outdoors. The watch displays information in both analog and digital formats. By pressing one button, you activate a touch screen built into the dial.

You can access an altimeter, barometer, thermometer, alarm, timer, or compass. Simply touch the word around the edge of the dial, and the hands spin to point at your choice. The barometer gives the current reading, and the hands indicate if the air pressure has been rising or falling during the last 8 hours.

Science fiction takes over when you touch the compass indicator. The hour and minute hand separate to form a “needle”

THE PATHFINDER

Price: \$250 with resin band; \$300 with titanium band
Casio's Pathfinder offers an altimeter, thermometer, barometer, digital compass and stopwatch. CASIO

with the minute hand pointing north. As you rotate the watch, the hand continues to indicate true north. T-touch even adjusts for magnetic declination so you get a true north-south line. What a great tool for telescope setup!

Tissot has expanded its Tactile line to include other unusual watches. If you want an alarm that doesn't awaken your spouse as you slip out to view the early morning sky, the Silent-T can do the job. This watch has a built-in vibration system that provides alarms and time-telling by touch with no loud squeak. The new Navigator 3000 provides an extensive list of times for world cities, again with touch-screen technology.

Tissot introduced the High-T to this line. The High-T can link directly to Microsoft Network (MSN) on the Internet and provide everything from e-mails to stock quotes. Imagine getting real-time weather forecasts while on a hilltop observing site.

Casio

If the Tissot watches look high-tech enough for James Bond, Casio's Pathfinder belongs with the Special Forces. The Pathfinder incorporates an altimeter, barometer, compass, alarm, and thermometer.

Casio also makes watches for fishermen that give sunrise, sunset, and Moon-phase information. The Casio Forester has a calendar, time signal, backlit dial, sunrise/



THE VECTOR WRISTOP COMPUTER

Price: \$219

This watch from Suunto combines an altimeter, barometer, and an electronic compass to make it an ideal watch for any outdoor enthusiast. Its compass lets the user correct the difference between true north and magnetic north. SUUNTO

sunset timekeeper, age and phase of the Moon function, and even a vibrating alert (to avoid frightening the fish).

Suunto

Suunto offers outdoor-adventure watches that adapt well to astronomy. Its Vector Wristop Computer provides many of the same functions as the Tissot T-touch in a purely digital format. The altimeter, barometer, and compass offer memory and log capabilities for this durable watch.

Suunto's X9 has a built-in GPS and can be linked to a laptop to upload/download information. Dick Tracy never had it so good!

Blancpain

It's difficult to capture nature's rhythms with digital technology. Watchmakers have long sought to do so with mechanical devices. One of the most difficult cycles to show with a mechanical watch is the equation of time — a formula that accounts for the earliest sunrise occurring before the summer solstice and the latest sunset occurring after the summer solstice, but not by exactly the same number of days.

A watchmaking firm little known outside of the watch-collecting world, Blancpain, combined the motion of the true Sun — as it appears in the sky — with the standardized motion of the mean Sun.

MANUFACTURER WEB SITES

PATEK PHILIPPE GENEVA
www.patek.com

**MAURICE LACROIX
INTERNATIONAL**
www.mauricelacroix.com

YES WATCH
www.yeswatch.com

TISSOT
www.tissot.ch

CASIO
www.casio.com/watches

SUUNTO
www.suunto.com

BLANCPAIN
www.blancpain.ch/e

SHARPE PRODUCTS
www.stonehengewatch.com

If you observe a sundial for a year, you will see that sundial time runs fast part of the year and slow at others. This variation from clock time can be as great as 16 minutes, not accounting for daylight-saving time. The explanation for this discrepancy lies in Earth's elliptical orbit and tilt. Publications such as almanacs give correction tables so you can set the clock in your hallway using a sundial.

Blancpain's Equation Marchante combines these disparate cycles and packs them into a platinum case. Only 50 of these watches exist, and it's fair to wonder, why? With today's computer technology, information such as this is just a mouse-click away. The Blancpain watch transcends pure function and moves into the realm of artistry.

The watch dial provides the time of day and the equation of time, and boasts a perpetual calendar and Moon phase. The dial also is cut away at the 6 o'clock position so you can see the instrument's heartbeat.

The back of the watch is a visual feast. The movement is hand-engraved with the Sun, Moon, and a star seen under the protection of a sapphire crystal. Even if we can't



Front

THE EQUATION MARCHANTE

Price: \$128,100

The Equation Marchante from Blancpain has two coaxial minute hands that indicate mean solar time and real solar time, respectively. Users can visualize the discrepancy between nature's rhythms and the time adopted by modern society. Only 50 were made. BLANCPAIN

own such a watch, we can at least dream of capturing the heavens in a platinum case.

Sharpe Products

The great American poet Henry David Thoreau admonished his readers to "simplify, simplify, simplify." If you feel as if you should heed this call, and you have no desire to wind watches or change batteries, a traditional solution awaits.

More than 2 decades ago, Steve Sharpe received a postcard from a friend, Peter Payack, that depicted the ancient monument of Stonehenge on a pocket watch. Peter called it the "Gentleman's Timepiece" still ticking after 5,000 years!

"The idea was a great leap backwards in timekeeping," says Sharpe. As his invention shows, Sharpe was up to the task, and he soon reduced the megalithic structure to fit in his pocket. The Stonehenge pocket watch was born.

This bit of whimsy has evolved from a standard pocket watchcase to the current model in pewter or gold tone. Pop the lid to find a reproduction of Stonehenge.

This watch comes complete with a compass and small rod that fits in the center of the stone circle to become a portable sundial! It includes a small quartz watch in the outside lid for those who just can't break away from our standardized, homogenized, regulated time.

Time for sale

As these watches prove, "Do you have the time?" is quite the loaded question:

"For which city?"

"Natural time?"

"Do you want GPS coordinates with that?"

From \$50 to \$1 million, you can find your ideal watch. Watches not only give you the time; but added luxuries can be time-savers. So, how much is your time worth? ■



THE STONEHENGE

Price: \$42.95 (pocket watch only);
\$47.95 (with chain)

Sharpe Products' Stonehenge preserves the timekeeping of antiquity with a small rod that fits in the center of the stone circle to become a portable sundial.

ASTRONOMY: WILLIAM ZUBACK