

The “Dutch Secret” and Jefferson Electric Clock History

by Roger Russell (FL)

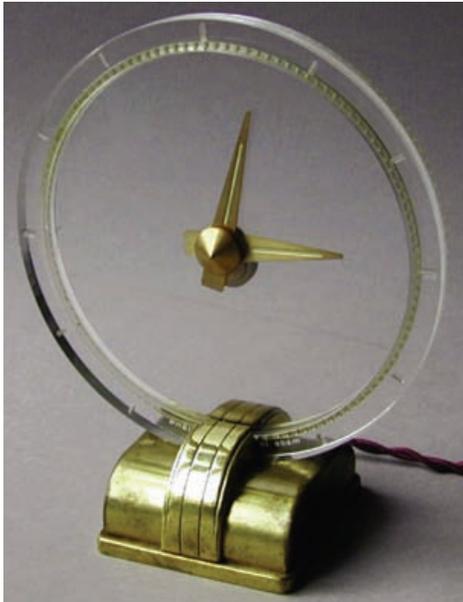


Figure 1. The “Dutch Secret” made by NUFA of Amsterdam, Netherlands.

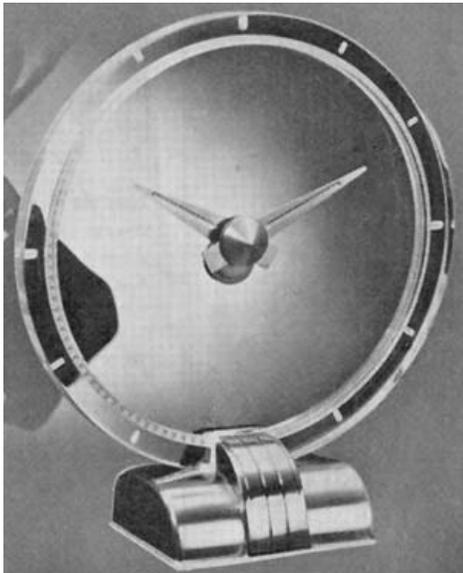


Figure 2. A catalog illustration of the “Dutch Secret”



Figure 3. The hand assembly shown from the back.

The latest addition to my clock collection is a rare find referred to as the “Dutch Secret” and shown in Figure 1. It may also be the connection that led to the introduction of the first Jefferson Electric clock in the United States in the late 1940s. The Dutch Secret was made by *Nederlandsche Uuwerkfabrieken* (NUFA) in Amsterdam, Netherlands. “Made in Holland” is written at the bottom of the transparent outer ring. The “secret” part of the clock is how the hands move without any apparent drive mechanism. The transparent disc that holds the hands rotates very slowly at one revolution per hour.

The outer ring of the Dutch Secret clock is 6-7/8" in diameter and 7/16" thick. It has oval hour positions that have an indented frosted surface. The marks at 3, 6, 9, and 12 o'clock are 0.130" x 0.255" and are 0.070" deep. The other hours are 0.080" x 0.215" wide and are 0.045" deep. A unique feature is the use of a small light hidden in the base. When the clock is plugged in, the ring illuminates and the hour marks can be clearly seen in dim light. There is no switch to turn the light on or off. The weight of the clock is 550 grams or about 1.2 lbs.

Figure 2 shows a clock from a catalog advertisement. The ad, which was originally in Dutch, translates to read as follows: “Invisible propulsion by a self-starting synchronous motor (220-240 Volt, 50 periods, 3 watt). The gilded hands are placed on a transparent plastic dial. A lamp fitted in the base illuminates the hour indicators. The height is 21cm [8.27 in.], the dial is 17cm [6.7 in.].” The clock sold for 81 guilders, or about \$40.

Figure 3 shows the hand assembly from the back of the clock. The minute hand is mounted on the front of the plastic disc. It is held by friction and can be moved to set the correct minutes. It is 2-13/16" long and 3/8" wide at the base. The hour hand and gear assembly are located behind the disc. The hour hand is 2-1/2" long and 3/8" wide at the base.

A shaft attached to the center of the disc has gears connected to the counterweight and hour hand. The gears reduce rotation so that one revolution of the disc advances the hour hand by one hour. The hour hand assembly can turn freely. The counterweight always stays in a vertical position and provides a fixed position needed to drive other gears that advance the hour hand. A small counterweight of metal is attached to the rear portion of the hour hand. It's the same shape and can be seen behind the main counterweight near the bottom of Figure 3. It serves to hold the hour hand in proper position relative to the minute hand.

The correct hours can be set by rotating the entire assembly one revolution in either direction for each hour. An indented line along the length of both hands was painted with radium paint. Radium paint was typically composed of a small quantity of radium plus zinc sulfide and a binder to hold them together. This is radioactive material and can glow in the dark for many years. However, the zinc sulfide deteriorates over the years and the glow gradually decreases. The radium, in comparison, remains active and has a half life of about 1600 years. The radiation intensity at one foot averages 0.03 mR/hr and is harmless. Even up close, at the point of contact, the combined radiation from both hands is only 2.1 mR/hr. Radium paint is no longer used in making watches and clocks.

What's Inside?

The base of the clock in Figure 1 is 1-13/16" high, 3-1/4" wide and 3-1/2" deep. The top of the base has removable covers at the front and rear. The front center cover has been removed in Figure 4 by removing a screw underneath the base. Access can then be gained to the Bakelite lamp module. The module can then be unplugged from the base to replace the lamp.

Figure 5 shows the lamp module removed and turned around to show the incandescent lamp. The lamp is about the size of a T 1-3/4 bulb. It is a #6828 6 Volt 0.6 watt lamp and is no longer listed in the catalogs. It mounts similarly to a bayonet-style base and can be removed with a slight twist. Two holes can be seen on either side of the lamp. This is where the module plugs into the two brass pins on the main clock body. The pins are actually the ends of the screws that hold the plastic outer ring to the base of the clock. They also provide a power connection for the lamp.

What is most interesting about this arrangement is where the six volts come from, because the line voltage is 220 to 240 volts. There is a separate winding on the motor coil to provide this voltage and the winding is electrically isolated from the rest of the motor winding. Of course, this could be conveniently done in the older motor designs where a separate motor coil was used. A second winding was easily added in manufacture, which is not possible in more modern motor designs.

The plastic outer ring in Figure 6 is viewed from the rear of the clock. It is held in place with the two brass screws mentioned previously. In the center of the picture, the output gear can be seen. This is a brass cylinder that has four prongs that rotate and mesh with the slots in the plastic disc. There are 120 slots around the perimeter of the disc. The cylinder rotates at 30 revolutions per hour or a half revolution per minute and this advances the disc one revolution per hour.

Looking from the other side, Figure 7 shows a better view of the four drive prongs. Here, the two mounting screws have been removed. Two red insulating shoulder washers can be seen where the two screws pass through.

The two screws that hold the two base top covers also hold the bottom cover in place. When the bottom cover is removed, the motor and wiring are exposed as shown in Figure 8. The motor assembly is welded to the base. Although reduction gears can be seen between the circular motor mounting plate and the upper part of the base, I made no attempt to take these apart.

Except for the motor, the base and metal parts appear to be all made of brass and not cast zinc alloy, which was used in the Jefferson clocks. The parts are non-magnetic and appear to be welded or brazed together. If these parts were zinc alloy or any other "white" metal, they could not be welded. The covers and clock base are about .040" thick. Each cover has an angle bracket, .060" thick, welded to it. This is evident in Figure 9, which shows where the inside of the rear center cover and bracket are attached. No effort was made to clean up the burn marks. Apparently, a corrosive flux was used to join the pieces.

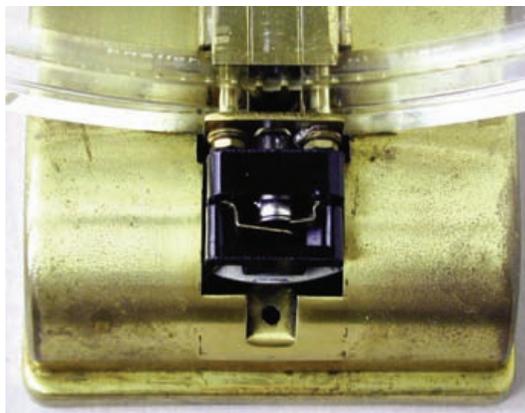


Figure 4. The front of the base with the center cover removed.



Figure 6. Rear of clock showing brass screws that attach the outer dial ring.



Figure 5. The lamp module removed from the base.

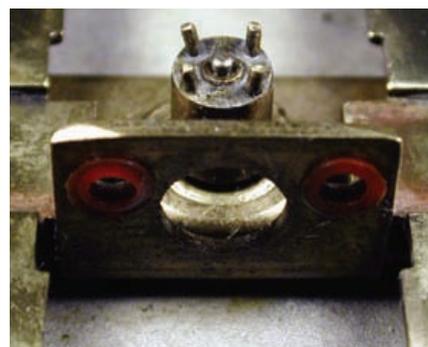


Figure 7. Output gear cylinder showing four drive prongs.



Figure 8. The motor and wiring.



Figure 9. Angle bracket welded to clock base cover.



Figure 10. The “Golden Hour”—Jefferson Electric’s first mystery clock.

Although there is no date on the clock, there are several characteristics about it that indicate it may have been made in the 1940s. The line cord is made of two insulated cloth-covered wires twisted together like much of the electrical equipment made in the 1920s and 1930s, such as Jefferson Electric toy transformers, as well as toasters, lamps, etc. The disc and ring could be made of Plexiglas, which was commonly available at that time. Plexiglas was introduced in 1936 by Rohm & Haas in both the United States and Germany. It was used extensively in airplanes in WWII. Radium paint was used on the hour and minute hands. The motor is typical of older electric clocks of the 1940s, such as the Rex Cole clock.¹

The Origin and History of Jefferson Electric Clocks

Jefferson Electric started in business in 1915. John A. Benan was president and James Charles Daly was chairman of the board. They began in a small, four-story building at 426-430 S. Green Street, Chicago, IL. Over the years, Jefferson made various kinds of transformers for cars, toys, doorbells, radios, etc. They also made ignition coils, fuses, and lamp ballasts. In 1931, Jefferson consolidated their several locations to a new 230,000 square foot building at 840 S. 25th Avenue in Bellwood, IL. By then, they made about 9,000 different electrical items.

The first Jefferson clock to be made was the “Golden Hour,” shown in Figure 10. Production began on December 2, 1949. It has been said that a clock such as the Dutch Secret inspired the Golden Hour design. It seems that in the late 1940s, the wife of the then president of Jefferson Electric found an interesting clock in a shop window while on vacation in the Netherlands. Her husband thought the idea was very novel and brought one back to the USA. He had the construction simplified to be what became the Golden Hour clock

and arranged to purchase the patent rights. The inventor was Leendert Prins of the Netherlands. The clock described in his patent number 2,248,195, dated May 1, 1945, is not the Dutch Secret, but a clock using the same principle and made by the Etalage Reclame Corporation of New York.² Warren Ferguson, an electrical engineer at Jefferson, designed the Golden Hour clock. Since this event took place so long ago, it may never be possible to confirm that the Dutch Secret was actually the model clock in question. Ferguson passed away in 1987.

Jefferson Electric was purchased by Litton Industries in 1967 and then sold to MagneTek in 1984. The clock division was closed in August

1991 and the employees were dismissed. After several negotiations, the clock division was sold to Timesavers in Scottsdale, AZ. The remaining stock of clocks was sold but no new clocks have been manufactured. Meanwhile, in August 1966, Jefferson became independent of MagneTek and is now located at 9650 South Franklin Drive, Franklin, WI 53132. They manufacture a large variety of dry-type transformers.

The Golden Hour clock was produced for more than 40 years and outlasted all the other models. The design never changed in all that time, and over two million were sold.³ Metal analysis of the ring and base of the Golden Hour clock shows that it is made of a zinc alloy called Zamac #3. This is mainly zinc with small amounts of aluminum, copper, magnesium, and tin. The ring and base are plated with 24k gold and have a brushed satin finish. Production of the Golden Hour clock included radium paint on the numerals and markers of the ring and the lines on the hands. Radium paint has been found on Golden Hours dated as late as 1965. Light green in color, it is typical of the paint used on many clocks, watches, and other items. A Geiger counter reading at one foot averages 0.20 mR/hr, which is very low. The Golden Hour is 8-7/8" high and the outside diameter of the dial is 7-7/16". The depth is 4-1/2"; weight is 2.3 lbs. It originally sold for \$19.95 but the price gradually increased over the years.

Following the great success of the Golden Hour clock, Jefferson made several other models using the same principle. Some of these smaller versions were the “Golden Helm” and “Golden Minute.” The Golden Helm, in the center of Figure 11, has spokes of a ship’s wheel added around the outer ring. The minute hand is shaped like a hook and an anchor is used for the hour hand. The clock measures 8" high including the spokes. The outside diameter of the dial is 6" (7-1/4" including the spokes). The depth is 4-5/8". It is 24k gold plated



Figure 11. Smaller Jefferson clocks: the “Golden Helm” in the center with two “Golden Minutes” on either side.

and weighs 2.2 lbs. The first date of manufacture was 1951 and it sold for \$29.95.

A “Golden Minute” is at either side of the “Golden Helm” in Figure 11. The chapter ring on the left clock has a chrome finish. The one on the right has a gold finish. They measure 7-3/8" high and the outside diameter of the dial is 6". The depth is 4-5/8". The hour and minute hands have radium paint in a line at the center. A Geiger counter reading at one foot averages 0.17 mR/hr. It is 24k gold plated and weighs 2.1 lbs. First date of manufacture is 1955 and it initially sold for \$24.95.

The “Exciting Hour” in Figure 12 is almost identical to the Golden Hour except that it has a brushed satin chrome finish. Dark blue paint is used instead of radium paint on the ring and hands. This clock was made only for a short time about 1960 and it sold for \$24.95.

The “Golden View” clocks in Figure 13 have dials the same size as the Golden Minute but have a wide wooden base. The chapter ring is black with gold numerals and lines to indicate the hours. The hour and minute hands have black paint in a line at the center. The black paint has either radium in it or has been painted over the radium paint. A measurement with a Geiger counter indicates a radiation average of 0.045 mR/hr at one foot.

The polished wooden base comes in either a mahogany or blonde finish. It has a half-round gold strip around the bottom. The base is 1-3/4" high near the dial and 1" high at the ends. It is 14" wide and 3-1/2" deep; height, including the dial, is 7". The weight is 2.8 lbs. The first date of manufacture was 1956.

Figure 13. “Golden View” clocks with wooden bases.



Figure 12. The “Exciting Hour.”

The “Golden Secret” clock in Figure 14 has no glass face. Instead, a flexible cable inside a curved hollow tube supports the hands. The cable, which is driven by a motor in the base, turns the minute hand. Gears time the hour hand with the use of a counterweight. The outer ring has gold discs at the 3, 6, 9, and 12 o'clock positions with smaller discs at the other hours. They appear to be brass and are welded to the ring. The base and base cover appear to be zinc alloy. The outer ring is 6-11/16" across at the outside. The overall dimensions are 7-3/16" high, 6-11/16" wide, and 4-3/32" deep. The curved cable tube is 3/16" in diameter. Two felt strips are under the base on the left and right sides. It is 24k gold plated and weighs 1.25 lbs. In 1956, the Golden Secret sold for \$22.95. The name “holland” is stamped in very small letters on the top of the outer ring. This clock or parts of this clock may have been made by *Nederlandsche Uuwerkfabrieken* of Amsterdam, which made the Dutch Secret. So far, no proof has been found.

Figure 14. The “Golden Secret.”





Figure 15. The "Suspense" clock.

The "Suspense" clock in Figure 15 is of a very different design, having a shadow box arrangement. A plastic disc 6-1/4 inches in diameter is suspended by a chain and driven by a motor at the top. The disc turns very slowly once every hour. The gold-colored hour and minute hands are both on the front of the disc. The minute hand is attached by friction to the disc so that it can be easily rotated to the desired time. A shaft attaches the hour hand to a counterweight that remains in a vertical position and is located behind the disc. The hour hand is driven through reduction gears from the minute hand similar to the Golden Hour clock. The numerals in the glass plate behind the dial are deeply etched and filled with gold. The frame, hands, motor cover, and chain are 24k gold plated. Its size is 13"H, 9-1/2"W and 3-1/2"D. The weight is 10 lbs. Production of the Suspense clock began in 1958 and it sold for \$50.00.

Jefferson made another series of clocks all having the same size and style case and all having second hands. Their size was 5-1/4"H and 4-11/16" in diameter at the widest part near the base. The electric versions are the "500" and the Lady Marion. An electric motor and time set knob are underneath. A plastic base raises the clock 7/16" above the table or shelf surface. A patented take-up "propeller" under the base allows the extra line cord to be stored out of the way. All of these models weigh 2.4 lbs.

Twenty-four-karat shiny gold-plated and chrome versions of the model "500" are shown at the left in Figure 16. A flat glass face has gold numbers on the dial glass at 3, 6, 9, and 12 o'clock positions with lines at the other hours. The hour and minute hands are gold. The second hand is red. The background is embossed black. First production of the "500" was on July 18, 1958. The rating is 115V.A.C 60 CY 3 watts. It retailed in 1962 for \$19.95.



Figure 16. Two "500" clocks on the left and two "Lady Marions" on the right.



Figure 17. A cordless electric assortment: far left; the "880", two in center; the "Integer," far right; the "Intermezzo."

Two "Lady Marion" clocks at the right in Figure 16 have a flat glass face. The far right hand one has all gray markings on the dial face. The other Lady Marion has a gold-colored crown at the center instead of gray. Both have gray numbers on the face at 3, 6, 9, and 12 o'clock positions with radial lines at the perimeter to indicate the seconds. The hour and minute hands are black; the second hand is gold. The case is 24k shiny gold plated. Retail was \$22.95.

Jefferson also made cordless electric versions such as the "880," "Integer," and "Intermezzo." They are the same size and about the same weight as the electric versions. These have a unique battery operation found in several other clocks of the 1960s. The mechanism is a typical spring-wound type. However, when it unwinds, an electrical contact closes and a solenoid is activated to wind the spring again. It goes "clunk" every few minutes. The time set knob and battery compartment are under the base. The original batteries were Mallory #RM 12R mercury cells but common AA batteries will also work.

The 880 is at the left in Figure 17. It has a transparent convex plastic dial cover with gold numbers at 3, 6, 9, and 12 o'clock and gold dots at the other hours. The name Jefferson is at the bottom. The hour and minute hands are gold colored. The second hand is white. The black clock face is slightly conical, rising to a peak at the center. The hands are shown angled back slightly. In 1962, this retailed for \$29.95.

The Integer has been found in both shiny 24k gold plate and chrome finish. These are shown near the center of Figure 11. The dial cover is transparent domed plastic and has black numbers at the 3, 6, 9 and 12 o'clock with black dots for the other hours. The hour and minute hands are black and the second hand is

red. The clock face is slightly conical, rising to a peak at the center. The hands are angled back slightly. It has a gold finish with 60 radial minute lines. The lines are white near the center and black near the edge. The base is black for the chrome version and white for the gold version. The Integer was introduced in the early 1960s and sold for \$29.95.

The “Intermezzo” is at the right in Figure 17. It has black hour and minute hands and a gold second hand set against a white cameo dial background. Raised circles with a gold floral design are at the 3, 6, 9, and 12 o'clock positions. Smaller raised circles each with a gold dot are at the other hours. A large raised white star figure with gold edges is in the center and points to each of the hours. The clock face is slightly conical rising to a peak at the center. The hands are angled back slightly. The case is 24k gold plated. In 1962, this clock sold for \$29.95.

The only other known Jefferson clock is the “Contemporaire.” The clock in Figure 18 is in poor condition and is missing the red second hand. This model is unlike any of their other clocks. A paste-on label on the bottom of the clock says Jefferson Electric Co., PO Box 230, Zeeland, Michigan. There is no model name on the clock. It has a conventional electric clock mechanism mounted in a rectangular wooden cabinet. The size is 5" high (5-3/4" including metal legs), 12" wide (13-1/4" including legs) and 3-1/2" deep. The date on this clock is November 1956. It was advertised to be available in mahogany, ebony, or limed oak, with solid brass trim, and sold for \$27.95. The metal legs on this particular clock are magnetic, indicating they may be only plated steel and not solid brass. Its weight is 3.8 lbs.

Jefferson provided a custom engraving service for several of their clocks. Advertising states that skilled artisans incorporated engraving, glass etching, silk-screening, or emblem mounting. These were ideal for awards or for fraternal organizations. Other versions, such as the bowler in Figure 19, were made of solid three-dimensional cast metal and are gold plated. The figure is mounted using a hole made in the rear of the base of a Golden Hour clock. The engraving at the front of the base says “All Star League 1951-52.” Also, a similar award clock with a golfing figure has been found, as well as other unusually styled award clocks. Sylvania award clocks have been found that are inscribed “Jefferson Electric Company Clock, Bellwood, Illinois,” on the motor housing and “Medallic Art Company, NY,” on the back plate at the bottom.

Jefferson clock parts, including the hand assemblies, were all made in the United States. The only exception is the Golden Secret, all or part of which may have been made in Holland. Many of the metal parts used in the Jefferson clocks are said to be made of brass, but analysis of the metal on the Golden Hour indicates that all are likely to be zinc alloy. The only exceptions



Figure 18. A Jefferson “Contemporaire.”



Figure 19. A “Golden Hour” custom award clock.

are the ring and hour dots on the Golden Secret, which are undoubtedly brass.

A unique feature of the Dutch Secret not incorporated into any of the Jefferson clock designs is the use of a light to illuminate the dial and hands, or as a night light to illuminate a wall behind the clock. Haddon, a competitor of Jefferson, used lights in several of their mystery clocks, such as the “Golden Vision,” “Special Vision,” and “Titan.”

Notes

- 1 Roger Russell, “Etalage and Rex Cole Mystery Clocks,” *NAWCC BULLETIN* (October 2002): pp. 571-576.
- 2 *Ibid.*
- 3 “Jefferson Electric Company” by Steven Berger, published in *150 Years of Electric Horology*, 1992 NAWCC Chicago National Convention Exhibit.

About the Author

Roger Russell is a retired audio engineer. He became interested in mystery clocks in the 1970s when he bought a Jefferson Golden Minute clock at an auction he attended in Chatham, MA. However, it wasn't until he retired that he began to uncover some of the history and collect many makes and models of these fascinating clocks. This is his third article about mystery clocks for the NAWCC BULLETIN.