

All you need to know about the Eiffel Tower





Key figures

- **Initial height:** 312 m (to the top of the flagpole)
- Current height (including antennas): 324 m

• The deepest foundations: (North and West) lie 15 meters underground. In each of these foundations, four pillars of masonry are built, which bear the four uprights of each leg of the Tower, known as rafters.

- Total weight: 10,100 tons
- Weight of the iron structure: 7,300 tons

• **Space between the pillars:** I st platform: 4,415 m²

2nd inner platform: 1,430 m² 3rd inner platform: 250 m²

• Height of the platforms:

Ist platform: 57 m 2nd inner platform: 115 m 3rd inner platform: 276 m

- Lighting: 336 600-W projector lamps (sodium lamps).
- Number of bulbs for the Sparkling Tower: 20,000
- Number of steps in the East pillar to the top: 1,665
- Number of rivets (total): 2,500,000
- Weight of paint used: 60 tons for each repainting campaign

• **Time required for painting:** the Eiffel Tower was repainted in its entirety every seven years.

• Number of elevators: From the ground to the second floor: 5 (one in the East pillar, one in the West pillar, one in the North pillar, one private elevator in the South pillar for the "Jules Verne" restaurant and one goods elevator in the South pillar). From the second floor to the top: two sets of two duolifts.

• Elevator speed: 2 meters/second.

• Passenger flow and capacity of the elevators

North pillar: 920 persons/hour East pillar: 650 persons/hour West pillar: 650 persons/hour Duolifts: 1,140 persons/hour Jules Verne: 10 persons/ascent Goods elevator in the South pillar: 30 persons or 4 tons/ascent

• Number of persons working on the Tower: SNTE: 280 Restaurants: 240 Souvenirs: 50 Other: around 50

- Number of analogical TV stations: 6
- Number of free digital TV stations: 30
- Number of radio stations: 31
- Number of antennas: 120

Gustave Eiffel (1832 - 1923)

Born on December 15, 1832 in Dijon, Gustave Eiffel was an exceptionally gifted engineer and builder. He graduated from the prestigious Ecole Centrale de Paris. His extraordinary career was marked in 1876 by the construction of the Maria Pia bridge over the River Douro in Portugal, then by that of the Garabit Viaduct in central France in 1884 and Budapest station in Hungary. He was responsible for the metal structures of the Bon Marché department store and the Crédit Lyonnais bank in Paris, the cupola of the Nice observatory, and, above all, the very impressive internal structure of the Statue of Liberty. The construction of the Eiffel Tower in 1889 was his crowning achievement. His career as an entrepreneur would come to an end with the failure of the Panama Canal project. From then on, he devoted his time to operating the Tower and to various experiments in air resistance, the observation of meteorology and especially the installation of a giant antenna for the earliest radio broadcasts. Indeed, it is because of these experiments that the Eiffel Tower is still standing, since it was initially built to last 20 years!

Biography – A few key dates

• **1832** - Born in Dijon on December 15 to François-Alexandre Eiffel and Catherine Mélanie Moneuse.

• 1843 - His early childhood is spent with his maternal grandmother and at school at the Lycée in Dijon where he passed his baccalaureate.

• **1850** - He enrols at the Paris college of Sainte-Barbe to prepare his entrance exam to Polytechnique. Having failed the exam, he signs on at École Centrale where he chooses to study chemistry.

• **1855** - He successfully obtains his diploma from École Centrale and embarks on a career in metallurgy, where his mother has some contacts.

• **1856** - He is recruited by Charles Nepveu, a builder of steam machines and equipment for the railways.

• **1857** - He is appointed head of the design department at Pauwels & Cie.

- 1858-1860 Construction of the Bordeaux bridge.
- 1860 Marries Marie Gaudelet on July 8.

• **1863** - Birth of his daughter Claire. The couple will have two more daughters and two sons.

• **1867** - Having been a self-employed consultant engineer for a year, he starts his own company.

• **1868-1871** - Construction of a viaduct on the Commentry-Gannat line.

• **1871-1873** - Various projects in Spain, Portugal, Romania, Egypt and Latin America, the viaducts of the Brive-Tulle line, and the Thouars Viaduct.

• 1875 - The Western Station in Budapest.

• **1876** - The Maria-Pia bridge in Portugal and numerous construction projects for the Universal Exhibition of **1878**.

- 1877 Death of his wife, then of his mother.
- 1879 Viana and Beira-Alta bridges in Portugal.
- 1880 Szeged bridge in Hungary.
- 1880-1884 Construction of the Garabit Viaduct.
- **1882** The Cubzac bridge and the exporting of bridges that can be dismantled in Indochina.
- 1883 Viaduct over the Tardes.
- 1884 Observatory of Nice, grand equatorial cupola.
- 1885 Internal structure of the Statue of Liberty.

• **1887** - Work starts on "the 300-metre high tower". Contract for the Panama Canal.

• **1889** - The Tower is completed. Opening of the Universal Exhibition.

• 1890-1895 - Involved in the Panama Canal corruption scandal, he is at first condemned by the Paris Appeals Court but the verdict is overruled and the builder is cleared of all wrongdoing. Gustave Eiffel withdraws from the company to devote his time to his scientific work.

• **1909** - Designed an aeronautics laboratory near the Champde-Mars, in Paris and experiments with detent apparatus.

• **1912** - Construction on Rue Boileau in Paris of the first wind tunnel.

• 1923 - Death of Gustave Eiffel on December 27.



The state of technology at

the end of the XIXth century

The end of the XIXth century saw a considerable number of inventions that have revolutionized our lives, from the telephone to car racing and the vaccine against rabies. At the time, Jules Verne was writing his futuristic novels, France was building a colonial empire, trade was prosperous and the industrial revolution was in full swing. Things were moving, everything was changing. This period, sometimes called "the spring of technology", was a time of creative effervescence, crowned by Gustave Eiffel's "Grand Iron Lady". The "A" over the Champ-de-Mars symbolized the beginning of a major movement that has continued to this very day.

Some scientific benchmark dates

• **1876-1877** - The four-stroke engine (Gottlieb Daimler, Nikolaus Otto, Maybach).

• 1876 - Philo Remington's typewriter.

• 1876 - The telephone is invented by Alexander Graham Bell.

• **1877** - The phonograph is invented by Charles Cros in France and then by Thomas Edison in the United States.

• **1879** - Thomas Edison invents the incandescent lamp and Werner von Siemens the first electric locomotive.

• **1881** - "La Rapide", a steam-run car, is invented by Amédée Bollée.

• **1882** - "The photographic rifle" is invented by Etienne Jules Marey and electric lighting appears in the streets of New York.

• 1883 - First attempts to transmit hydraulic energy.

• **1884** - Lewis Edson Waterman invents the first practical fountain pen.

- 1885 Louis Pasteur invents the vaccine against rabies.
- 1886 The first electric street lamps appear in Paris.
- 1887 Construction of the Eiffel Tower begins.

• **1888** - Kodak arrives in France. Heinrich Hertz discovers electromagnetic waves.

• **1889** - Transparent photographic film on nitrocellulose is invented by George Eastman.

• **1890** - Clément Ader takes off aboard "Éole". Léon Serpollet designs the three-wheel steam-run vehicle. The iron filings coherer by Edouard Branly, the first person to detect Hertzian waves. Etienne Jules Marey introduces chronophotography on mobile film.

• **1891** - Edouard Michelin brings in the first removable tires for bicycles, adapted to cars in **1894**.

• 1892 - Émile Reynaud's optical theatre at the Musée Grévin. The first engine patent was filed by Otto Diesel.

• 1894-1903 - The first car races on roads.

• **1895** - The first Lumière film showing open to the public and the discovery of X-rays by Wilhelm Röntgen.

• **1896** - The discovery of radioactivity in uranium salts by Henri Becquerel.

• **1897** - The first wireless telegraph transmission by Edouard Branly and Guglielmo Marconi.

• **1898** - The first telegraph link between the Panthéon and the Eiffel Tower (Eugène Ducretet and Ernest Roger). Pierre and Marie Curie: radium.

• **1899** - The first wireless communication across the Channel by Guglielmo Marconi.

• **1900** - The Universal Exhibition, the first Paris metro and the construction of the first rigid airship or dirigible balloon by Count Ferdinand Von Zeppelin.

• 1901 - Santos Dumont flies over the Eiffel Tower in a dirigible.

• **1902** - Léon Gaumont invents the chronophone, the ancestor to talking film.

• **1903** - The Wright brothers take off for the first time in their biplane.

• **1904** - The first telegraph links are set up from the Eiffel Tower, under the supervision of Captain Ferrié.

- 1908 Wilbur Wright's flights.
- 1909 Louis Blériot crosses the Channel.
- 1915 Paul Langevin invents sonar.



The Eiffel Tower era

One century after the French Revolution, France was booming in the scientific, cultural and artistic fields. This was the golden age of Freud, Zola, Jules Verne and Rodin.

1886

• General Boulanger is appointed Minister of War.

• Industry is carried by science, and science stimulated by industry.

• Improvements in means of communication (the Suez Canal opened in 1869) puts China a month away from Marseille, and Japan less than 40 days away.

• The Impressionists show their work in New York despite never having met with success in France.

• The Americans inaugurate the Statue of "Liberty that lit the world", designed by sculptor Auguste Bartholdi (structure by Gustave Eiffel).

• At the end of the XIXth century, fashion reflects economic and social life. Lavishly attired, the bourgeoisie fills the salons in vogue, the clubs and theatres.

• Sarah Bernhardt plays Marion Delorme.

• Sigmund Freud opens his practice in Vienna.

1887

- Sadi Carnot is elected President of the Republic.
- Building of the new Bourse de Commerce is completed.

• The first labor exchange opens in Paris.

• The International Congress of Astronomers decides to make the first map of the sky.

- André Antoine founds the Free Theatre.
- Gustave Ferrié enters Polytechnique.

1888 -

- William II becomes Emperor of Germany.
- 11,000 people in France have a telephone.
- Emile Zola completes Les Rougon-Macquart.
- Jules Verne has been writing Les Voyages Extraordinaires for 25 years.

1889

- Banquet of the Mayors of France.
- The decline and end of Le Boulangisme.
- Foundation of the Second International.

• Benjamin Harrison is elected President of the United States, and the first Panamerican Conference is held in Washington.

• Paul Claudel writes Tête d'Or, Alfred Jarry embarks on Ubu Roi, Knut Hamsun pens Hunger and Paul Bourget Le disciple.

- Vincent Van Gogh and Paul Gauguin in Arles.
- Foundation of the the Nabis group of artists.

• Birth of Charles Spencer Chaplin, known as Charlie... and of Martin Heidegger, Adolf Hitler, Abel Gance, Jean Cocteau, Jean de Lattre de Tasssigny.

• Death of Jules Barbey d'Aurevilly, Philippe de Villiers de l'Isle-Adam and Eugène Chevreul, a French chemist fascinated by the construction of the Eiffel Tower.

- After Les Bourgeois de Calais, Auguste Rodin sculpts The Kiss.
- Birth of René Barthélémy, the pioneer of French television.



Beginnings and construction of the Eiffel Tower_

For the Universal Exhibition of 1889, a date that marked the centenary of the French Revolution, the Journal Officiel launched a major competition to "study the possibility of erecting an iron tower on the Champ-de-Mars. The tower would have a square base, 125 metres on each side and 300 meters high". The project proposal by entrepreneur Gustave Eiffel, engineers Maurice Koechlin and Emile Nouguier and architect Stephen Sauvestre was chosen out of a total of 107.

The design

Fifty engineers and designers produced 5,300 drawings, and over 100 workers built more than 18,000 different parts of the tower in a workshop. Another 132 workers assembed them on site.

Construction

• Work on the foundations began on January 26, 1887 and took five months, with the workers using only spades. The rubble was taken away by carts drawn by horses and steam locomotives.

• **The pillars.** While there was no problem building pillars 2 and 3 on the Champ-de-Mars side, on the Seine River side, pillars 1 and 4 required air-compressed foundations using corrugated steel caissons five meters under water.

• The deepest foundations lay just 15 meters underground. The feet of the tower were set in each of these foundation ditches (four foundations in masonry, which supported the four pillars, known as truss frames).

• Assembling the first floor. The difficulty of the assembly lay in the point of departure at the base of the truss frames. They had to be positioned at a slanting angle so that they would meet the horizontal beams on the first floor. To achieve this, the engineers used hydraulic jacks to move each "foot" and erected an original scaffolding system, on top of which were a number of boxes of sand that emptied to regulate the slant of the truss frames. The jacks no longer exist, but the Eiffel Tower operating company, Société d'Exploitation de la Tour Eiffel, has reproduced them, and they are on show in the Ferrié Pavilion on the first floor of the Tower.

• The second floor was assembled with cranes that took the same route as the elevators. All of the parts were built in the Eiffel workshops in Levallois, on the edge of Paris, and riveted into position on site. The Tower was mounted rather like a giant Meccano® with remarkable precision, which was a major innovation at the time.

• From the second to the third floor, the carpenters worked wonders and there was not one single fatal accident during the construction period.

• The monument was inaugurated on March 31, 1889. On that day, Gustave Eiffel climbed the 1,710 steps of the Tower to plant the French flag at its peak. He was followed by the members of the Council of Paris, including Emile Chautemps, President of the Paris City Council. The Eiffel Tower was the highest building in the world until 1929, when the Chrysler Building in New York topped it at 319 metres.

Key figures for an epic

• The four pillars of the Eiffel Tower stand in a square that measures 125 meters on each side. They are oriented in line with the 4 cardinal points.

- The metal structure weighs 7,300 tons.
- Total weight: 10,100 tons.
- Number of rivets used: 2,500,000.
- Number of iron parts: 18,038.
- Cost of construction: 7,799,401.31 French gold francs of 1889.

	Height	Surface
Initial	312 m	
Current	324 m	
l st floor	57 m	4 415 m ²
2 nd floor	115 m	I 430 m ²
3 rd floor	276 m	250 m ²



The elevators

Since the opening of the Eiffel Tower for the Universal Exhibition of 1889, visitors have been able to visit the different floors of the monument via elevators. A formidable technical feat for the period as never before had engineers tackled such constraints of height and elevator loads. These elevators have offered total security to hundreds of thousands of visitors climbing the Tower for a better glimpse of Paris from its very beginning. Although today we may take these elevators for granted, back then they were considered a great technical achievement. Certain elevators from the early days of the Tower's existence are still operative; preserved with great care, they attest to the technical heritage that genius and visionary Gustave Eiffel contributed to our present day.

The elevators at the time of construction

• **Between the ground floor and the second floor:** The four pillars were equipped with one or two cabins. In June 1889, five hydraulic elevators went into operation. This initial elevator technology was further modernized a decade later by Gustave Eiffel for the Universal Exposition of 1900.

• Between the the second and third floor: An "Edoux" elevator was put into service, a hydraulic machine that was the only one of its type in the world, with jacks 80 meters long. (It was dismounted in 1983).

• North and South pillars: "Otis" elevators carried the visitors up and down until dismounted in 1910.

• **East and West pillars:** "Roux-Combaluzier" elevators were in service until 1897.

The elevators today -

• North pillar: A "Schneider" electric elevator was installed in 1965, modernized between the years 1994 and 1995 and then revised again in 1997. Its speed reducer was changed in 2004.

• **South pillar:** An "Otis" electric elevator has been used exclusively by customers of the Jules Verne restaurant since 1983. Also in service, a 4-ton freight elevator built in 1989 was revised in 2003 and then in 2007.

• **East and West pillars:** "Fives-Lille" hydraulic elevators were installed in 1899, modernized in 1986 and 1987, and revised in 1992, 1995 and 2005. In 2008, the major project of totally replacing the West pillar elevators began, with the intention of coming back to the original and simple functioning machines imagined by Gustave Eiffel in collaboration with the Fives-Lille company in 1899.

The public has an opportunity to discover the historical elevator equipment in a guided visit during the yearly open house event celebrating European Heritage. Enter into a true Jules Verne universe, into the center of the Tower, where all those surprising machines are in action.

• Between the the second and third floor: the "Edoux" hydraulic elevator did not function in winter (the gel stopped the machinery from working) and was dismounted in 1983. The hydraulic pump that fed the machine with water is now on display on the first floor of the Tower.

Two double-cabin electric elevators by Duolift-Otis were installed in 1983, replaced by new ones in 1994 and 1995, and then revised in 2007.

The elevators are vital to the monument and subject to some harsh treatment. Their annual journeys combined are equal to two and half times around the world or more than 103,000 kilometers. The cabins, the electrical and computer systems, along with the historical machinery behind the elevators receive the greatest care and maintenance: renovation work, repairs, parts replaced and oiled. They are constantly checked by technicians, who start them up early in the morning before the public arrives and keep them under close surveillance whenever the Tower is open to the public. Eiffel Tower elevator operators handle the smooth flux of visitors.



The Eiffel Tower: a subject of controversy_

As is the case with many major architectural projects that today constitute part of France's cultural heritage, the Tower has suffered the slings and arrows of detractors. Protest well predates the construction of such controversial structures as the Pompidou Center and the Louvre Pyramid. But time alone always proves the final judge – and in the case of the Eiffel Tower, the verdict has already been rendered. During construction, several personalities protested violently. On February 14, 1887 Le Temps published a manifesto signed by "personalities from the world of arts and letters"* railing against the construction of a 300-meter tower on the Champs de Mars esplanade. Gustave Eiffel fought tooth and nail for his project, but the temperature of the heated debate just kept rising. A number of persons did later change their views and make amends. Sully Prudhomme, for example, expressed his admiration as early as 1889. Coppée waxed lyrical on the subject, and the Tower inspired Gounod to write a little "concerto in the clouds".

The artists* protest

Letter published in Le Temps, February 14, 1887.

"We, writers, painters, sculptors, architects, passionate lovers of the beauty, until now intact, of Paris, hereby protest with all our might, with all our indignation, in the name of French taste gone unrecognized, in the name of French art and history under threat, against the construction, in the very heart of our capital, of the useless and monstrous Eiffel Tower, that public spite, often marked by good sense and a spirit of justice, has already baptized the Tower of Babel.

Without becoming hotheaded or chauvinistic, we have the right to loudly proclaim that Paris is a city without rival in the world. On its streets, its widened boulevards, the length of its admirable embankments, along its magnificent walks there will suddenly appear the most noble monuments ever fashioned by human genius. The soul of France, creator of masterpieces, shines from this majestic flowering of stones. Italy, Germany, Flanders, so justly proud of their artistic heritage, possess nothing comparable to ours, and in every corner of the universe Paris calls forth curiosity and admiration. Are we to let all that be debased? Will the city of Paris thus continue to be associated with the strange and venal imaginations of a machine-maker, bringing upon itself dishonor and an ugliness that can never be corrected? Because the Eiffel Tower, which even commercial-minded America does not want, is - make no mistake - the dishonor of Paris. Everyone feels it, everyone says it, everyone is profoundly distressed about it, and we are but a weak echo of the general opinion, so rightly alarmed. In the end, when foreigners come to our Exhibition, they will cry out, astonished, 'What?

This is the horror the French have found to give us an idea of the taste they boast about?'

They will be right to mock us, because the Paris of sublime gothic architecture, the Paris of Jean Goujon, of Germain Pilon, of Pujet, of

Rude, of Barye, etc., will have become the Paris of Monsieur Eiffel. Moreover, all you need do to fully understand what we are saying, is to imagine for a moment a dizzyingly ridiculous tower dominating Paris, as well as a gigantic black factory chimney completely crushing with its barbaric mass Notre Dame, the Sainte-Chapelle, the Saint-Jacques tower, the Louvre, the Invalides' dome, the Arc de Triomphe, all our monuments humiliated, all our architecture belittled, and ultimately disappearing in this staggering dream. And for twenty years, we will see stretching out over the entire city, still quivering with genius from so many centuries, we will see stretching out like a growing ink spot the hateful shadow of the hateful column of bolted iron.

You, who love Paris so, who have made her so beautiful, who have protected her so often from administrative devastation and the vandalism of industrial companies – you once again have the honor of defending her. We are leaving it to you to plead Paris's cause, knowing that you will bring to that task all the energy, all the eloquence, that love for what is beautiful, what is great, what is just, inspires in an artist such as yourself. And if our cry of alarm is not heeded, if our reasoning is not heard, if Paris persists with the idea of dishonoring Paris, we will at least, you and ourselves, have voiced a protest to do us credit."

* Among the noteworthy names in the long list of signatures are those of the Paris Opera architect Charles Garnier and writers François Coppée, Alexandre Dumas fils, Charles-Marie Leconte de Lisle, Guy de Maupassant and Sully Prudhomme.

Gustave Eiffel's reply ____

"I will tell you all that I think, and all that I hope. For my part, I believe that the Tower will have its own beauty. Do people think that because we are engineers, beauty plays no part in what we build, that if we aim for the solid and lasting, that we don't at the same time do our utmost to achieve elegance? Are actual conditions of strength not always compatible with the hidden conditions of harmony? The first principle of architectural aesthetics is that the essential lines of a monument should be determined by it fitting perfectly into a setting. But what condition did I need to address in the case of the tower? Resistance to wind.Well, I maintain that the curves of the four groin vaults of the monument, based on calculations, starting with the enormous and unused footing at the base, are going to taper up to the summit, will give a great impression of strength and beauty, because they will convey to the eyes the boldness of the conception in its totality. Similarly, the numerous empty spaces that are part of the plan, part of the very elements that go into the construction, will bear strong witness to the constant concern of not uselessly sacrificing to violent thunderstorms surfaces that pose a danger to the stability of the edifice. What's more, there's an attraction in things colossal, a special charm to which theories of ordinary art are hardly applicable. Will we maintain that it's because of their artistic value that the Pyramids have so fired the imagination of men? After all, are they anything other than artificial hillocks? Yet what visitor remains unmoved in their presence? Who has not returned from them filled with an admiration that is irresistible? And what is the source of this admiration, if not the immensity of effort and the grandeur of the result?

The Tower will be the highest edifice ever raised by man – will it not therefore be grandiose as well, in its way? Why would what is admirable in Egypt become hideous and ridiculous in Paris? I've sought an answer, and must confess have found none."



Scientific and technical applications.

From the time of his project proposal in 1886, Gustave Eiffel knew that the Tower's service to science alone could protect it from its enemies and extend its life span. At the beginning it was meant to last 20 years and then be destroyed! Eiffel therefore spelled out the uses he had in mind: meteorological and astronomical observation, experimentation in physics, a strategic observation post, a communications base for signaling, a beacon for electric light and wind studies. He said: "It will be an observatory and a laboratory such as science has never had at its disposal. That's why, from Day 1, all our scientists have encouraged me with such strong fellow feeling." In fact from 1889 onward, the Eiffel Tower was used as a laboratory for scientific measurements and experiments. Much scientific equipment was installed (barometers, wind gauges, lightning conductors, etc.). Gustave Eiffel even built himself an office on the third floor to carry out astronomy and physiology observations.

Why the Eiffel Tower is made of iron -

What are the advantages of iron? Gustave Eiffel himself gives the answer: "First of all, its resistance. From the viewpoint of loads one or the other of these materials can support, we know that for any given surface area, iron is ten times more resistant than wood and 20 times more resistant than stone." He points out: "It's above all in the large constructions that the metal's resistance makes it superior to other materials. The relative lightness of metal constructions also allows for smaller supports and foundations." And he concludes: "To give just one example, that of the Exhibition Tower, I astonished more than one person who was worried about the load on the floor of the foundations, by saying that the load wouldn't be any greater than that of a house in Paris."

The scientific experiments

The day after the Tower was inaugurated, Gustave Eiffel installed a meteorology lab on the third floor. He also had a passion for aerodynamics and performed a series of observations on falling bodies (dedicated equipment was installed from 1903 to 1905). He then imagined "an automatic device sliding the length of a stretched cable between the second level of the Tower and the ground". He had a small wind tunnel built at the foot of the tower. From August to December 1909 he carried out five thousand tests. In addition, Gustave Eiffel encouraged others to perform experiments on the Tower: Foucault's pendulum, the mercury manometer, physiology studies and radio contact (1898).

Movement of the Tower top

The Tower sways slightly in the wind. During the storm of 1999, it moved approximately 13 centimeters from its initial position. But the Tower is also affected by heat. When the temperature is high, that portion of the structure exposed to the sun expands more than the portion in the shade. To "get out of the sun", the Tower can lean as much as 18 centimeters.



The history of telecommunications on the Eiffel Tower

The Tower hosted the first radiophonic experiments and played a crucial role in the beginnings of French television. Gustave Eiffel greatly encouraged research into radio transmissions by allowing the Tower to be used as a monumental antenna. In 1909, the Tower was saved from demolition thanks to the launch of wireless telegraphy. The top of the Tower was modified over the years, to accommodate an ever-growing number of antennas. Today, it is home to several dozen antennas of all sorts, including a television mast that reaches a height of 324 meters. The first experiments in television broadcasting from the Tower date from 1925 and the first regular broadcasts from 1935.

November 5, 1898

First wireless telegraph link spanning the four kilometers between the Panthéon and the Eiffel Tower (Ernest Roger and Eugène Ducretet).

December 15, 1903

Gustave Eiffel allows the Minister of War to place antennas on the Tower, saying "I offer to take on all the costs that could result from these experiments."

January 21, 1904

The Eiffel Tower transmitter enters the history books when the head of the Engineers' Corp accepts Eiffel's offer. Captain Gustave Ferrié becomes the Tower's second "great man". The military network is gradually established.

1905

Links between the Eiffel Tower and the fortified towns of eastern France guaranteed in all weather.

1907-1908

A link is set up with Casablanca during the Morocco campaign.At night the station is relayed by the cruiser, the Kléber, transmitting directly to the Eiffel Tower.

1909

The Eiffel Tower's "military radio-telegraph station" is completed. After wooden barracks, an underground station is installed.

January 1909

First wireless telephone trials at the Eiffel Tower by Colin and Jeance.

May 23, 1910

The Eiffel Tower serves the French Navy with the first regular time signal transmission service. Signals could be heard 5,200 kilometers away at night, and half of that distance during the day. In the daytime, the signals are picked up at Batoum, Georgia, and by night at Glace Bay, Canada. Thanks to Commander Ferrié, it becomes possible to set up an international time organization to unify the way time is measured throughout the world and to determine longitudes accurately.

1910

Link with dirigibles.

|9||

Link with airplanes.

1914-1918

• The Eiffel Tower plays a key role during the war. The Marne taxis. Links with the La Fayette station in the USA in 1917.

- Mata-Hari is arrested.
- Zeppelin alerts (Louis de Broglie works from the Eiffel Tower).

November 10, 1918

The Tower picks up the following message: "The German command agrees to the conditions of the Armistice that are imposed on it."

1921

Lucien and Sacha Guitry carry out the first experiment with a radio broadcast transmitted by the Tower.

1922

A temporary studio is set up in the Tower's North pillar.

1925

• Maurice Privat launches the "Spoken Newspaper".

• The first television tests carried out by Édouard Belin at the Eiffel Tower mark the beginning of a new – and brilliant – career for the Tower.

1929

Three times a day, the Tower broadcasts the observations of 350 weather stations between Europe, North Africa and the Atlantic Ocean (from Iceland to Cape Verde).

April 26, 1935

First television broadcast. From 60 lines at the outset, the number rose to 441 lines in 1945.

1953

The beginning of Eurovision: crowning of Queen Elizabeth II of England.

1957

A television antenna is placed at the top of the monument. The Tower "grows" from 300 to 318.70 meters.

1964

To celebrate the Tower's 75th anniversary, mountaineers climb to the top and Eurovision broadcasts the exploit.

1997

Launch of the Eiffel Tower Internet site (www.tour-eiffel.fr and www.eiffel-tower.com).

2000

After work carried out by Télédiffusion de France (TDF) on the UHF antenna the Tower "grows" again, this time from 318.70 to 324 meters.

2005

The first broadcasts of digital terrestrial television in Paris originated from the transmitter on the Eiffel Tower.

Key figures

- Number of analogical TV stations: 6
- Number of free digital TV stations: 18
- Number of pay digital TV stations: 30
- Number of radio stations: 31
- Number of antennas: 120



Feats and exploits on the Tower

The Eiffel Tower has inspired numerous sporting, artistic and scientific feats, but has also been witness to some incredible stunts and challenges. Its history is full of feats and exploits.

1889

• Le Figaro sets up a printing press on the second floor and produces its daily paper on site.Visitors buying their newspaper can have their name inscribed on their copy to "certify" that they climbed the Tower.

• On September 11, Gustave Eiffel welcomes Thomas Edison and his phonographs on the first floor. The men dine together.

1901

On several occasions Santos-Dumont sets off from Saint-Cloud, just to the west of Paris, in his dirigible and flies past the Eiffel Tower to win a prize.

1905

Le Sport organizes a championship race up the stairs to the first floor, won by Forestier in 3 minutes, 12 seconds. The prize: a bike.

1909

On October 18, the Count of Lambert flies over Paris and around the Eiffel Tower for the first time in the history of aviation. His aircraft is a "Wright", made of wood and canvas.

In Eiffel's aerodynamics laboratory at the foot of the Tower, the first research is carried out on the plane wing sections used by Wright, Voisin and Farmann, using the vertical drop from the second floor.

1912

• "Birdman", one Reichelt, a tailor based in Longjumeau, throws himself off the first floor with his handmade parachute and crashes to the ground at the feet of the press.

• An aviation enthusiast, Gustave Eiffel builds the first return flow wind tunnel, as a result of numerous plans and drawings. The "Engineer of the Universe" conducted over 5,000 experiments on the resistance of wings and propellers to air.

1923

The journalist Pierre Labric, future Mayor of Montmartre, cycles from the first floor down to the ground on his bike, and without authorization. The descent was given substantial coverage. The cup won by the "hero" is currently to be found in the cellars of the Eiffel Tower.

1926

The aviator Léon Collot is killed flying under the Eiffel Tower. Blinded by the sun, he hits the television antennas.

1934

Jacopozzi installs a clock and a thermometer along the Tower. Red lamps represent mercury.

1939

For the Tower's 50^{th} anniversary, high mass is celebrated on the first floor in the presence of the Archbishop of Paris, Mgr. Chaptal.

1944

On August 24, a three-colored flag, the symbol of liberated Paris, is raised to the top of the Tower. The flag is made from three bedsheets sewn together.

1948

Bouglione, of the eponymous circus, takes one his "inmates" for a little promenade. At 85, the oldest elephant in the world cannot make it further than the first floor.

1964

To celebrate the Tower's 75th anniversary, mountaineers Guido Magnone and René Desmaison climb the Tower, and the event is broadcast by Eurovision.

1983

• Charles Coutard and Joël Descuns ride up and down the Tower on their motocross bikes.

• An international auction is held in the Gustave Eiffel room on the first floor to sell parts of the spiral staircase that linked the second and third floors – with 12 television channels attending.

1984

Two Britons, Amanda Tucker and Mike MacCarthy, parachutejump from the third floor without permission.

1987

A.J. Hackett, a New Zealander, bungy-jumps from the second floor.

1989

For the centenary of the Eiffel Tower, the tightrope walker Philippe Petit "walks" across the 700 meters that separate the Palais de Chaillot from the Tower.

1995

Triathlete Yves Lossouarn breaks the record for climbing the Tower stairs on foot in 8 minutes and 51 seconds. Seventy-five athletes take part in the race, organized for a special Arte television evening.

1997

• A professional British stuntman parachute-jumps from the first floor of the Eiffel Tower.

 $\bullet~12^{\rm th}$ World Youth Days: the Pope pays a tribute to the Eiffel Tower in front of 300,000 pilgrims gathered on the Champ-de-Mars to meditate.

• To celebrate Halloween, an extraordinary vegetable garden containing 85 tons of pumpkins is installed in the Trocadéro gardens.

1998

• Hugues Richard breaks the record for climbing the Eiffel Tower stairs from the ground floor to the second floor on a mountainbike.

• For the Football World Cup, nearly 700 journalists and 120 television stations from all over the world are welcomed to the Eiffel Tower, in the reception pavilion set up for the occasion on the ground floor. Throughout the World Cup, a camera set up on the roof of the Unesco building films the Eiffel Tower around the clock. The footage is used as the reference for televisions the world over.

• The "Three Tenors" concert at the foot of the Eiffel Tower: José Carreras, Placido Domingo and Luciano Pavarotti sing on the Champ-de-Mars for an audience of 200,000 people, with the illuminated Eiffel Tower as a backdrop.

1999

A golf tournament is held in Paris for the first time with the first and last hole under the Eiffel Tower.

2000

• As part of the Firemen's World Games, the most prestigious competition – climbing stairs from the ground to the first floor of the building – is held at the Eiffel Tower.

• The Eiffel Tower is decked out for the Europe Days on May 9. European flags are raised on the first floor, on the gallery roof.

• The set of a French fund-raising telethon is installed on the Champ-de-Mars. The Eiffel Tower is in the background throughout the many hours during which the program is broadcast live on the France 2 channel.

• The Orchestre de Paris and the Boston Symphonic Orchestra conducted by Seiji Ozawa give a free concert on the Champde-Mars in front of the Eiffel Tower, which is illuminated for the occasion.

• Johnny Hallyday gives a free concert at the foot of the Eiffel Tower for an audience of 600,000 people. Pyrotechnics and a light show enhance the Tower for the occasion.

200 I

• The Spaniard Aitor Sarasua Zumeta smashes the record previously set by Hugues Richard for climbing the tower on a mountain-bike.

• As part of an exhibition on the Champ-de-Mars organized by the French land army, 10 climbers of the Paris Fire Brigade climb up to the second floor of the Eiffel Tower and abseil down from the first floor.

2002

• Hugues Richard breaks his own record in 1998 of climbing the Tower on his mountain-bike.

• The Eiffel Tower participates in the first "Nuit Blanche" organized by Paris City Hall on October 5. Sophie Calle, at the top of the monument all night, welcomes visitors who come to tell her stories. The Eiffel Tower welcomes 18,425 people between 6 pm and 7 am.

• The Tower welcomes its 200 millionth visitor since it opened in 1889. To celebrate the event, an exceptional evening is organized on the first floor. All the tourism professionals and partners who contributed to the success are invited, and more than 1,200 of them accept.

• An immense heart made from 5,000 vine stocks painted pink is placed at the foot of the Eiffel Tower. The event is held in aid of the people affected by the explosion at the AZF plant in Toulouse in September 2001.

2003

• The Eiffel Tower is decked out in colors representing Paris's candidature to host the Olympic Games of 2012.

• The First International Meetings for Defense are held on the Champ-de-Mars. The Paris Fire Brigade puts on a show around the Eiffel Tower by abseiling from the first floor.

• Centenary of the Tour de France: the prologue departs from the foot of the Eiffel Tower.

• For the end-of-year festivities, a forest of fir trees is planted under the Eiffel Tower. A giant hopscotch game is installed on the first floor.

2004

• The VTT champion, Xavier Casas from Andorra, beats his own record for climbing the steps on a VTT: 1,300 steps! He obtained an entry in the Guinness Book of World Records for this feat.

• French champion ice skaters, Sarah Abitbol & Stéphane Bernadis, inaugurate the 200-square-meter skating rink installed on the first floor of the Tower. A real success, the rink welcomed more than a thousand skaters each day.

2005

On May 18, the athlete Jerome Sue descended the 345 steps from the first floor to the ground floor in a wheel chair.

2006

• A roller skating rink was set up on the first floor from November 18 to 20. Taïg Khris, twice world champion in the sport, amazed the amateurs with his demonstrations.

• Yoggi, young French champion of the monocycle, went up the stairs to the second floor in 22 minutes without setting foot on the ground.

2007

• From June 1 to 10, the Tower welcomed an under-water diving pool 240-square-meters in size installed at the foot of the Tower allowing 3,000 visitors to get a scuba diving initiation.

• At the end of the year, visitors were able to put on snowshoes and follow a 300-meter trail of snow around the first floor of the monument. For this celebration of the Polar Year, a special icy bar opened and a 6-meter ice model of the Eiffel Tower decorated the first floor.



The Eiffel Tower and artists

If the Tower began its life as an attraction, in the 1920s it became a symbol of modernity and the avant-garde. Little by little its image became associated with Paris, to the point where it became the city's symbol around the world. In a just twist of fate, poets, painters, singers, choreographers, filmmakers and photographers regularly pay homage.

Films

• 1897 - "Panorama pendant l'ascension de la Tour Eiffel" by Louis Lumière and "Images de L'Exposition 1900" by Georges Meliès

- 1905 "La course à la perruque" by Georges Hatot
- 1923 "Paris qui dort" by René Clair
- 1924 "La cité foudroyée" by Luitz Morat
- **1927** "La Tour" by René Clair (documentary) and "Mystères de la Tour Eiffel" by Julien Duvivier
- 1930 "La fin du monde" by Abel Gance
- 1939 "La Tour Eiffel" by Jean Denis
- 1942 "Monsieur la souris" by Georges Lacombe
- 1945 "À l'assaut de la Tour Eiffel" by Alain Pol
- 1948 "The Man on the Eiffel Tower" by Burgess Meredith
- 1951 "The Lavender Hill Mob" by Charles Crichton
- 1952 "Bonjour Paris" by Jean Image (cartoon)
- 1955 "Marguerite de la nuit" by Claude Autant-Lara
- 1956 "Le chanteur de Mexico" by Richard Pottier
- 1959 "Tour Eiffel idylle" by Louis Cuny
- 1960 "Zazie dans le métro" by Louis Malle

• **1963** - "Les plus belles escroqueries du monde-Paris" de Claude Chabrol.

- 1965 "La grande course autour du monde" de B. Edwards.
- 1966 "Un idiot à Paris" by S. Korber
- 1968 "Paris jamais vu" by Albert Lamorisse (documentary)

• **1980** - "Les uns et les autres" by Claude Lelouch and "Superman II" by Richard Lester

• **1981** - "Condorman" by Charles Jarrott (Walt Disney) and "La Tour Eiffel en otage" by Claudio Guzman

• 1982 - "Le ruffian" by José Giovanni

• **1984** - "Rive droite – rive gauche" by Philippe Labro and "A View to a Kill" by John Glen

- 1994 "Un indien dans la ville" by H. Palud
- 1998 "An American werewolf" by Anthony Waller
- 2000 "Epouse-moi" by Harriet Marin
- 2003 "Le Divorce" by James Ivory
- 2003 "Il fuggiasco" (The Fugitive) by Andrea Manni
- **2004** "Le démon de Midi" (The Demon Stirs) by Marie-Pascale Osterrieth
- 2005 "Angel-A" by Luc Besson
- 2005 "The Da Vinci Code" by Ron Howard
- 2006 "La légende vraie de la Tour Eiffel" (TV) by Simon Brook
- 2007 "Rush Hours 3" by Brett Rattner

Paintings -

• **1888 -** Georges Seurat: "La Tour Eiffel" (Fine Arts Museum of San Francisco)

• **1889** - Jean Beraud: "Entrée de l'Exposition Universelle" (Musée Carnavalet in Paris)

- **1890** Le Douanier Rousseau: "Moi-même, portrait paysage" (Narodni Galerie in Prague)
- 1890 Paul Signac: "Seine Grenelle" (Private collection)

• **1911** - Robert Delaunay: "The Red Tower" (Solomon R. Guggenheim Museum in New York)

• **1910/1912** - Robert Delaunay: "La ville de Paris" (MNAM - Centre G. Pompidou in Paris)

• 1913 - Marc Chagall: "Paris Through the Window" (Solomon R. Guggenheim Museum in New York)

• **1926 -** Romaine Brooks: "Jean Cocteau" (MNAM - Centre G. Pompidou in Paris)

• 1954 - Marc Chagall: "Champ-de-Mars" (Essen, Museum Folkwang)

• **1954** - Nicolas de Staël: "La Tour Eiffel" (Musée de Troyes) And then there's Raoul Dufy, Gino Severini, Utrillo, Bernard Buffet, Pol Bury, Roger Lersy...

Poets and writers

Blaise Cendrars, Guillaume Apollinaire, Aragon, Raymond Queneau, Jean Cocteau, Jean Giraudoux, Le Corbusier, François Coppée, Dino Buzzati, Guy de Maupassant...

Blaise Cendrars - "Tower" (1913)

You are all Tower Ancient god Modern beast Solar spectrum Subject of my poem Tower World tower Tower in movement (Du monde entier) (1912-1924 NRF). Translated by Tony Baker

Guillaume Apollinaire – "Zone"

At last you are tired of this ancient world O shepherdess Eiffel Tower, the flock of bridges bleats this morning You're fed up with living in Greek and Roman antiquity ... Translated by the American scholar and critic Roger Shattuck

Jean Giraudoux - "Prayer on the Eiffel Tower"

The smallest wind guides me. Rather than walk back along the Seine, I followed its current. Patrols were escorting this poet, who was going to work – and there was the Eiffel Tower! My God, what faith its engineer had in universal gravity! Blessed Virgin, if the theory of the law of gravity were to prove but a fabrication, even for a quarter of a second, what magnificent rubble! This is what can be erected with theories. Here is the string of iron that the wizard has thrown up to the heavens, which he invites his friends to climb...I knew Eiffel, I am climbing...

Translated by Randall Holden

Jean Cocteau

...Around the charming neck, Eiffel, the beautiful giraffe in lace, meeting place of unknown travelling pigeons, leaves below the eloquent blue falling by the water... the paver's song Translated by Gillian O'Meara

Raymond Queneau - "The Skeleton Tower"

Eiffel Tower of bones Catacombs in the air Staircased tibias And at three hundred meters above the ground The antenna skull That speaks only to listen (Courir les rues - NRF)

Guy de Maupassant - "Lassitude"

I left Paris and even France, because the Eiffel Tower ended up boring me excessively. Not only did one see it everywhere but one found it everywhere, made from every material known to man, on display in every window; an inevitable, agonizing nightmare. La vie errante (1890)

Translated by Randall Holden

Singers

- Michel Emer: "Paris, mais c'est la Tour Eiffel..."
- Charles Trénet: "Y'a d'la joie, la Tour Eiffel part en balade..."
- Léo Ferré: "Paris portait sa grande croix..."
- Jacques Dutronc: "La Tour Eiffel a froid aux pieds..."
- Pascal Obispo: "Je suis tombé pour elle..."

Choreographers

"Les mariés de la Tour Eiffel" by Jean Cocteau was performed for the first time the evening of June 18, 1921, at the Théâtre des Champs-Élysées, by the Swedish ballet company of Rolf de Maré. Music by Germaine Tailleferre, Georges Auric, Arthur Honegger, Darius Millaud and François Poulenc, choreography by Jean Cocteau, sets by Irène Lagut, costumes and masques by Jean Hugo.

...and the advertisers

For many years the Eiffel Tower has been used in advertising. On the very steeple of the Tower, between 1925 and 1936, Citroën appeared in luminous letters. Since then, Air France, La Samaritaine, Yves Saint Laurent, Jean-Paul Gaultier, Nina Ricci, Alain Afflelou and Campari have been some of the best known brands to use the icon.



Illuminations

Because of its size and structure, the Eiffel Tower has inspired extremely sophisticated and original lighting innovations. By turns a sparkler, a Parisian beacon, an advertising sign, a torch, a Christmas tree, a beauty bathed in red and a fireworks theatre, the Tower has a history that is closely linked with the history of lighting. Spectaculars, bedazzlements, memories...the very night it was inaugurated, ten thousand gaslights enhanced the gown of the Iron Lady!

1889

Two projectors on rails installed on the top floor of the Tower light the monuments of Paris. Its continuous beacon of bluewhite-red, which would periodically emit blazes of light, is the most powerful in the world. During the Universal Exhibition, the Tower is lit every night with the aid of gaslights placed in balls of opaline.

1900

The Tower's lighting goes entirely electric: 5,000 bulbs delineate its sides in straight lines.

1907

A giant clock 6-meter high, installed on the second floor, tells the time in luminous numbers.

1925-1936

André Citroën, quite taken with the idea of a lightshow spectacular, makes FF500,000 available to Fernand Jacopozzi. A device involving 250,000 bulbs of different colors is installed on the monument. The first show takes place on July 4, 1925. The name Citroën on three sides of the Tower is visible at a distance of 40 kilometers. The shows, judged too costly at nearly a million francs, stop in 1936.

1933

Citroën presents Parisians with a gift clock with a face 15 meters in diameter. The hands are multicolored rays that light in succession to tell the time.

1937

The Arts and Techniques Exhibition. André Granet builds under the frame of the first floor platform a gigantic chandelier with 10 kilometers of fluorescent tubes in various colors. Thirty searchlights trained on the sky dress the Tower in white light while its lace of iron throws off reflections in gold, blue and red. Each evening the levels are transformed into fountains of fire. After the 1914-1918 war, the Tower becomes a beacon for aircraft in Paris (until 1974).

May 1958

1,290 projectors are installed in several holes dug into the Champ-de-Mars (used until December 31, 1985) to light the monument.

1978

For Christmas, a tree of light decorates the Tower with 30,000 bulbs.

1985

A new device to light the Eiffel Tower takes its inaugural bow on Decembre 31, 1985. Designed by Pierre Bideau, lighting engineer, the device is the crowning element of a restoration program for the monument approved by the city of Paris in 1980. 336 projectors (1,000W, 400W, 150W, directing beams of light from the bottom toward the top) illuminate the Eiffel Tower from the interior of its structures.

Replacing the 1,290 used since 1958, the new projectors are installed in banks of 4 to 7 units. All are equipped with highpressure sodium lamps yellow-orange in color (except for eight projectors containing incandescent lamps placed at the top).

Lighting the projectors takes less than 10 minutes. It can be done manually or using a dusk switch that is protected against risks of untimely activation.

The power level built into the device is 320 kW (it had been 620 kW previously). The annual consumption is 680,000 kWh. The high-pressure sodium lamps (with a life of 6,000 hours) initially furnished by Philips and Mazda are replaced every three years. The total cost of installing the device was FF4 million, and annual use runs to FF600,000.

This source of illumination, unanimously deemed a success worldwide, served as the point of departure for rethinking night illumination of monuments in Paris and other major French cities.

April 5,1997

At midnight, the Mayor of Paris activates a countdown in light of "1,000 days to the year 2000". Situated 100 meters from

the ground on the side of the monument facing Trocadéro, the "counter" is illuminated day and night, changing the number daily at midnight. It is 33 meters high and 12 meters wide, weighs 50 tons, and is composed of 1,342 projectors.

December 31, 1999

The Eiffel Tower signals the Year 2000. At midnight there begins a veritable dance of fire lasting 3 minutes 30 seconds, a pyrotechnical ballet, the likes of which have never been seen. On this occasion the sparkling effect conceived by Pierre Bideau is revealed in all its glory, and then the Eiffel Tower sparkles with 20,000 lights every night for 10 minutes to mark each hour while its new beacon sweeps Paris. The event is an international success and the images are broadcast all over the world.

2000

All year long the light counter displays "Year 2000".

December 31, 2000

The Eiffel Tower's glitter takes on a blue hue for several nights to celebrate entry into the new millennium.

July 14, 2001

After 18 months the glittering' effect is turned off. Planned initially to last 12 months but extended due to its resounding success, the equipment has now given all it can give.

June 21, 2003

The Eiffel Tower gets the glitter back for ten years on the occasion of Paris's renowned Fête de la Musique. Mayor Bertrand Delanoë throws the switch, and the event is broadcast live from the Champ-de-Mars on France 2 television. The plan is the same as it was in 2000: 10 minutes at the beginning of each hour from nightfall to 2 am in the summer (1 am in winter).

January 24, 2004

The Eiffel Tower is lit in red. The occasion is the France-China Cultural Exchange Program: for the first time since its creation, the Tower is bathed in red January 24-29 to mark the Chinese New Year.

Thanks to clever use of external projectors, the monument is bathed in a scarlet symbol of happiness, celebration, joy and prosperity. The switch is thrown January 24 during a lighting ceremony at the Place Jacques Rueff in the Champ-de-Mars, attended by the French and Chinese Ministers of Culture and the Mayors of Paris and Beijing.

2004

The 336 Philips projectors that give the Eiffel Tower its golden look are replaced.

2006

On may 8 at midnight, the Eiffel Tower lit up in blue in celebration of the 20^{th} edition of Europe Day.

2007

• February I, between 7:55 and 8pm, the Tower shut off its lights in respect to "Turn off Your Lights - France in the Dark for 5 Minutes", an energy-saving operation showing France's dedication to sustainable development. The Tower repeated the operation on October 22.

• The evening of September 6, Mayor of Paris Bertrand Delanoë and the Presidents of the International Rugby Board and France's Rugby Federation unveiled the special lighting for the World Rugby Cup, which lasted from September 7 to October 20. The Tower went green from the ground up to the second floor in resonance with the color of the playing field. Also adorning the Tower was a huge illuminated goal with a 85-meter long crossbeam and a huge rugby ball 13 meters long attached to the second floor. Finally a giant 120-square-meter screen was made available for the public to watch the games.

Painting the Eiffel Tower

To protect the Iron Lady's surface, the Eiffel Tower is covered in paint. In fact, the stylish Lady's attentiveness to color coordination has resulted in the need for three different shades of paint to go with the hues of the Parisian sky – darkest at the bottom, lightest at the top.

The different coats of paint

• During the construction – mainly in puddle iron with very low carbon content - the Eiffel Tower was given its first coat of paint in red iron ocher. Mr. Nourisson then had the second and third coats applied in linseed oil. Painting was completed in March 1889.

• In May 1889, a glazed fourth coat was applied by the same contractor, Mr. Nourrisson; its reddish-brown color shaded off gradually from the base to the top. Guaranteed for one year, this one coat alone cost 60,000 gold francs.

• In 1892, the paint job received its first cleaning. The contractor was Mr. Rivière. The previous coat was washed and a new coat of ocher-yellow paint applied. The job cost 57,000 gold francs, but with maintenance guaranteed for five years.

• In 1899, it was decided that the EiffelTower would be repainted every seven years.

• **Since 1988,** climbers with video cameras have been monitoring the condition of the paint in those areas most difficult to access.

• **December 2001** saw the beginning of the 18th painting of the Eiffel Tower since its construction. For the first time, a new lead-free paint was used, in the interests of protecting the environment. A new timetable was adopted.

A specific color

Currently, the color on display is a specific three-tone variation of bronze, with the lightest tone at the top. It was adopted in 1968 after several color changes ranging from the original reddishbrown to ocher-yellow. The three different shades today ensure a perfectly hued complement to the color of the Paris sky.

Key figures behind the painting of the Eiffel Tower

- Weight of paint: approximately 60 tons
- Time required: 15 to 18 months
- **Frequency required:** the Tower is entirely re-painted every 7 years. The 19th painting is scheduled to begin autumn 2008 and finish at the beginning of the year 2010.
- 25 painters
- Cost of the 18th painting in 2001: 3 million euros



Eiffel Tower Restaurants

The history behind the Eiffel Tower restaurants is inseparable from the "Great Moments" in history from the monument's opening to the public in 1889. The Tower offers its visitors breathtaking seating overlooking Paris: a delight for the eyes and the taste buds. Today a range of restaurants cater to the different needs and tastes, from snack shops to gourmet cooking.

Food lovers meet on the first floor

For the Universal Exhibition of 1889, four majestic wooden pavilions designed by Stephen Sauvestre decked the platform on the first floor. Each restaurant could seat 500 persons. The kitchens were located under the platform, relying on gas lights, until 1900.

• **River Seine West side:** A bar dubbed "Flamand" offered Alsatian cooking and the waitresses wore regional clothing. It was then transformed into a very popular theater. During the Exhibition of 1900, it did become a short-lived restaurant again, this time with a Dutch touch. The theatre resumed its activities up until war broke out in 1914.

• **Between the East and North pillars:** A typical Russian restaurant welcomed visitors.

• In step with the period: Visitors could choose to stop into the English-American bar located between the South and West pillars.

• **Champ-de-Mars East side:** Visitors were offered French fare at Brébant, considered a chic restaurant.

These four establishments were demolished for the International Exposition in 1937, which led to a complete overhaul of the Tower's first floor. Only two restaurants were built, one where last stood the Russian restaurant and the other filled the spot held by the previous Dutch restaurant. Architect Auguste Granet, who married the grand-daughter of Gustave Eiffel, headed the 1930s-style construction.

In the beginning of the 80s, these restaurants were replaced when the Tower underwent major renovations. The "La Belle France" and "Le Parisien" became the two restaurants on the Eiffel Tower not to be missed. In 1996, they formed one huge brasserie decorated by Slavik & Loup under the theme of hot-air balloons, paying homage to the view. It was named Altitude 95, referring to the fact that it is located 95 meters above sea level. To be completely redone end of 2008, it is expected to re-open to the public beginning of 2009.

Gourmet cuisine 120 meters above the capital

By 1983, the construction of the Jules Verne restaurant on the second floor was finished, paying homage to the literary master and spokesperson of scientific and industrial progress inspiring everyone's lives. Chef Alain Reix oversaw the kitchens, and customers had privileged access via the South pillar elevator reserved exclusively for use by the restaurant.

On December 22, 2007, following four months of renovations the Jules Verne was redesigned by Patrick Jouin - it opened its doors to the public, with the renowned Alain Ducasse helming the cuisine.



The Eiffel Tower behind the scenes.

The Eiffel Tower is open 365 days a year. So that nearly 7 million visitors can be welcomed in the best conditions, operations behind the scenes resemble those in a well-oiled industrial plant.

Consumption

• Electricity consumption: 7.8 million kWh per year, the equivalent of a village of some 100 homes, including 580,000 kWh for the illuminations. The French electricity utility EDF provides the Tower with electricity at 20 kW. In 2007, the Eiffel Tower reduced its consumption of electricity by 40%.

• The Tower is equipped with 19 different transformers. In case of a breakdown, three 1600 kW generators automatically take over.

• More than 100 different models of lamp, i.e 10,000 bulbs light the Tower; 20,000 are needed when the Tower sparkles at night. Electricians replace the bulbs regularly, a job that often requires scaling the Tower.

• Over 80 kilometers of electric cables cover the entire structure.

• 60,000 m³ of drinking water and 705,000 kWh of heating and air conditioning are also required every year.

• Another surprising consumption figure is the 2 tons of paper used every year to print the tickets for visitors. The Eiffel Tower is the world's most visited entrance-paying monument.

Cleaning

Specialist teams ensure the daily cleaning of the Tower. Every year, they use:

- 4 tons of dusters and cleaning cloths,
- 10,000 doses of a variety of cleaning products,
- 400 liters of detergents,
- 25,000 bin bags.

Security and surveillance

A security post monitors the Tower and its visitors around the clock, thanks to over 100 cameras – over one-third of which are infrared for nighttime surveillance – positioned throughout the monument.

To prevent fire, the monument is equipped with a 800-point surveillance system, a whole network of sprinklers, and over 150 extinguishers of all sorts. Fire hydrants on the first two floors are fed by a water pipe that starts on the ground, while those on the top floor are supplied from pressurized water tanks.

Jobs in the Tower

The people who work for the Eiffel Tower operating company, Société d'Exploitation de la Tour Eiffel, carry out a variety of jobs. The reception staff, all multilingual, guide and inform visitors who come from all over the world. Meanwhile, technical jobs involve many different professions: electricians, mechanics, plumbers, painters, locksmiths, computer technicians, joiners, etc.

But the Tower also has shops with sales staff, photographers, a post office and its employees, restaurants and their waiters, maîtres d'hôtel, cooks, security staff, cleaning and maintenance teams, office staff, etc.



Visitors

In 2003, the Tower celebrated the fact that it has welcomed over 200 million visitors in I I 4 years. Royalty, stars, tourists, international celebrities, strollers – these "Eiffel Tower citizens" all form part of the history of one of the capital's most astounding jewels. As with the Pyramids, the Leaning Tower of Pisa, the Acropolis, the Coliseum and the Statue of Liberty, the Eiffel Tower stirs the curiosity and evokes admiration. Since 1998, over 6 million people have visited the monument each year!

The Iron Lady is receiving!

1889

Their Royal Highnesses the Prince and Princess of Wales are the first crowned heads to ascend the monument. Many others follow in their footsteps: Oscar II of Sweden, George I of Greece, Leopold II of Belgium, Japan's royal family, the czarevitch, the Shah of Iran, the King of Portugal and the Egyptian princes.

The year it opens, the Eiffel Tower attracts high society.

1889

Thomas Edison demonstrates his phonograph at the Eiffel Tower. Sarah Bernhardt puts in quite an appearance.

1900

Archduke Charles Ferdinand of Austria is delighted by the speed of the elevators and the marvelous terrace on the second floor...

1921

The future Emperor of Japan takes a walk on the Eiffel Tower during his first visit to Europe. He is 20 years old.

1939

A gala dinner to mark the 50th anniversary of the monument brings together the Duke of Windsor and the Ambassadors of Spain and Poland.

1953

The Tower receives its 25-millionth visitor, who wins an automobile.

1962

• Edith Piaf sings on the Tower during a gala to launch the film "The Longest Day" by D. Zanuck.

• In August, President Dwight Eisenhower comes with his wife and grandchildren.

1963

In September, Yuri Gagarin, the first cosmonaut, invited to France by General de Gaulle, pays an informal visit.

1964

In May, the Tower reaches the age of 75. Maurice Chevalier and 74 other Parisians born in 1889 celebrate their birthday on the monument.

1966

Charles Aznavour and Georges Brassens sing on the Tower to mark the launch of the world campaign against hunger.

1968

Georges Pompidou, Prime Minister, attends a ministerial press lunch.

1970

Valéry Giscard d'Estaing receives an African delegation on the Tower.

1982

Jacques Chirac, Mayor of Paris, inaugurates the new pavilion on the first floor.

1983

• Mireille Mathieu is hostess to the 100-millionth visitor to the Tower.

• In June, Alexis Weissenberg gives a piano recital on the first floor.

1985

• In June, from the Eiffel Tower, Rajiv Gandhi and François Mitterrand watch a show given by the MELA intercultural festival to celebrate the Year of India in France.

• In September, three astronauts from the space shuttle Discovery (D. Brandenstein, J.O. Creighton and L. Shamon), in France on official invitation, visit the Eiffel Tower.

1993

The 150-millionth visitor.

1997

• In April, Queen Sirikit of Thailand, accompanied by Madame Bernadette Chirac, wife of the President of the French Republic, inaugurates the "Thailand, treasures of artisans" exhibition, located on the first floor. The event is chosen by Thailand to close the Jubilee festivities of King Bhumibol, celebrating 50 years of reign.

• In May, Madame Chirac gives a press conference in the Gustave Eiffel room on the takings of the "small coins campaign" alongside the campaign's spokesman, judo champion David Douillet.

• In June, French astronaut Claudie André-Deshays and the Russian crew of the Cassiopée mission, back from the Mir space station, are received at the Eiffel Tower. (French astronauts often come to the monument, and have been known to take tiny Eiffel Towers with them on their missions.)

• In October, it's astronaut Jean-Loup Chrétien's turn to be received at the Tower, accompanied by the crew members of the American shuttle Atlantis.

1998

Michel Platini is received at the Eiffel Tower, 100 days before the World Cup.

1999

Three Nobel Prize Winners are invited to the Eiffel Tower on the invitation of Unesco.

2000

• Bill Cody Garlow, the great grandson of Buffalo Bill, visits the Eiffel Tower, as his grandfather had 111 years earlier.

• Ludmila Poutine, wife of the Russian President, pays her first visit to the Eiffel Tower and has a photo session on the third floor.

200 I

A visit from Mr. Robert Kotcharian, President of the Armenian Republic.

2002

Officers of the Fire Department of New York, heroes of the September 11, 2001 attacks on New York, visit the monument. Private visit from Boris Yeltsin, former President of Russia.

2004

The President of China, Hu Jintao, accompanied by his wife, pays a visit to the Eiffel Tower. With him is France's President Jacques Chirac and Madame Bernadette Chirac. The four dine in the Jules Verne restaurant on the Tower's second floor.

2006

• Actors Jackie Chan and Chris Tucker were filmed on location at the Tower, performing some spectacular scenes from the film "Rush Hour 3".

• Private visit by the American singer Michael Jackson.

2007

• Private visit by American actor Pierce Brosnan.



Exhibitions

Exhibitions at the Eiffel Tower

- 1982 "Lovers of the Eiffel Tower"
- 1984 "The City of Paris: Its Museums and Their Patrons"
- 1985 "The Eiffel Tower Welcomes Space"

• **1986** - "Hungary and the Eiffel Tower" and "New Edition of the years 1886-1887: Illustrations and the inauguration of the exhibit Les Années 1886-1887"

• **1988** - "The State of Invention, during the times of Gustave Eiffel"

- 1990 "Imagine the Eiffel Tower"
- 1991 "Towers of the World, from Babel to our time"

• **1992** - "Visions of Europe": the Eiffel Tower celebrates Europe by presenting the works – paintings, sculptures and photographs – of 50 artists from 30 European capitals.

• 1993 - "World Encounters"

• **1994** - "The Unique and Manifold Tower". A major postcard competition is organized for the occasion. Among the oldest cards is a "Libonis" by the eponymous engraver, postmarked August 21, 1889, the earliest of any card depicting the Eiffel Tower.

• 1995 - "The Eiffel Tower and the Advent of French Cinema 1889-1929"

• 1996 - "The Story of Iron"

• **1997** - A tribute to the 50th anniversary of the French Polar Expeditions, an ice floe setting – with tracked vehicle, sleigh, explorers and even penguins – is installed on the first floor platform. The installation is opened by the President of the Republic Jacques Chirac.

• **1998** - "Before the Year 2000 - Jules Verne: Visionary of Unknown Worlds": the "From earth to the moon" shell is reproduced on the first floor and the elevator machinery becomes the Nautilus gangways. A giant portrait of Jules Verne, made from aluminum pellets mounted on to a 300 m² net weighing 2.1 tons, was lifted into position between the first and second floors.

• **1999** - "Craziness and creativity": this exhibition presented on the first floor platform shows the "craziest" projects that have marked the life of the Eiffel Tower.

• **2000** - "Siüdmak: Fantasy Universe": the Polish painter Siudmak shows some 40 of his works in the Ferrié Pavilion.

• **2000-2004** - "The Eiffel Tower in Celebration": this exhibition set up in the Ferrié Room, traces all the exceptional events celebrated by the monument from its opening to the Year 2000 spectacular.

- 2002 "Wojtek Korsak, Tours and Detours": photo exhibit.
- 2003 "The Eiffel Tower in 1900, Vintage Postcard Exhibition»

• **2003** - "André Juillard, 36 Views of the Tower": exhibit of the André Juillard's drawings.

• 2004 - The Oriental Pearl Tower in Shanghai on show at the Eiffel Tower: a tour of Chinese culture and gastronomy. The operation cemented the partnership agreement signed in December 2003, as part of the France-China Cultural Exchange Program, by the Presidents of the two towers: Mr. Jean-Bernard Bros, Deputy Mayor of Paris, and Mrs. Niu Weiping.

• 2007 – The Eiffel Tower in Film Posters

- **2007** – Inuits in the 21^{st} Century, Polar Fauna and the Threatening Climatic Changes

• **2008** - The Parisian Chronicles: 70 years of daily life in Paris From the Collections of the Roger-Viollet Agency

Exhibitions held in France in collaboration with the Eiffel Tower

• **1981** - "All about the Eiffel Tower or the life and adventures of the Eiffel Tower as told by children", Musée en Herbe Gustave Eiffel, City of Dijon

- 1982 "Gustave Eiffel and His Times", Postal Museum
- 1983 "Eiffel" Mâcon Saint Alban
- 1984 "100 Year anniversary of the Garabit viaduct"

• **1985** - "The Extraordinary Life and Works of Gustave Eiffel" - Levallois-Perret

• **1989** - "The Eiffel Tower is 100" - Levallois Perret "The Eiffel Tower and the Universal Exhibition" – Musée d'Orsay "TheTour Eiffel, a tour of force" - Foundation Mona Bismarck

• **1999** - "Robert Delaunay - From Impressionism to Abstraction, 1906": an exhibition devoted to Robert Delaunay is held at the Centre Georges Pompidou. The exhibit includes his famous "Eiffel Tower" series of paintings. The inaugural lunch is held at the Eiffel Tower and brings together the curators of the world's finest museums. • **2001-2002** - "The 72 scientists on the Eiffel Tower", Library of the Institut Henri Poincaré.

• 2003 - "An Eiffel Tower high in colors" - Centre Georges Pompidou.

Exhibitions outside France

• 1985 - Eiffel Sveriges Tekniska Museum, Chris Hinchcliffe -Sweden

• **1986 -** "Gustave Eiffel y su obra – La Torre Eiffel Hoy" - Madrid, Spain

• 1987 - Eiffel at the Franco-Portuguese Institute - Lisbon, Portugal

• 1988/1989 - "The Eiffel Tower, a 100-year message" - Tokyo and Osaka, Japan

- Hankyu, Umeda, Osaka

- Moern Art Museum, Gunma, Takasaki
- Matsuhushi, Hamamatsu, Shizuoka
- Iwate Kenmin Kaikan Museum, Morioka, Iwate
- 1989 "The Eiffel Tower, a tour de force" New York, USA
- 1992 "La Torre Eiffel en Mexico" Mexico
- 1993 "La Torre Eiffel" Caracas, Venezuela

• **1999 -** The Eiffel Tower Tour on show in Florence. The city of Florence devotes a major exhibition to the Eiffel Tower, entitled "From Tuscany to the Europe of Gustave Eiffel. The Eiffel Tower on the banks of the River Arno".

• **2004** - The Oriental PearlTower in Shanghai welcomes the Eiffel Tower for a week, with a photo exhibition and an introduction to French gastronomy.

2004 - "Gustave Eiffel - De Europa hacia América" - Panama.



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